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[For Index to Illustrations see page VI.]

- ABBEYS:** Dryburgh, 735; Kirkcaldy, 510; Newbath, 337; Tewkesbury, 510; Welbeck, 860; Westminster, 805, 861, 897
Aberdeen: University, 643; water supply, 620
Abingdon sewerage, 937
Academy, royal: prize work at, 833; proposed removal to the Haymarket, 165; sculpture, 455
Academy, royal Scottish, 938
Access to shore, right of, 128
Acoustic advertising by architects, 59
Act, factory, 1891, notes on, 172
Action by mortgagees against surveyor, 654
Adamant, Twyford's deluge, 558
Advanced building construction, 649
Advertisement frauds, alleged, 59, 127
Advertisers, a hint to, 128
Advertising: acoustic, by architects, 59; hoarding, fees for, 439
Agents: house, commission, 59
Agreement, building, mortgage of, 892
Air, town, impurities in, 203
Albert Palace, Battersea: 620; L.C.C. and the, 765
Alfriston, old clergy house, 407
Algerian Pompeii, an, 59
Alhambra alterations and decorations, 441
Almanacs and diaries, new, 874
Altar-places at National Gallery, 245
Alteration of premises, 378
Alterations, internal, and the building act, 33
Alternative plans, architects' charges for, 759
Amateurs as clients, 431
American: architects on competition, 720; chimneys, tall, 375; institute of architects, 726
Ancient: buildings, society for protection of, 31; lights, 233, 374; paintings at Canterbury, 685
Angles, the architecture of, 307
Annan water supply, 333
Antiquities, architectural, of I of W., 555
Ants, to get rid of, 755, 792
Apologists for and assailants of the Institute, 791
Appliances, domestic sanitary, 347
Application of architectural education, notes on, 653
Applied: architecture, 482; art (lectures on) 514 (school of Edinburgh) 375, 549
Approximate cost, cubing buildings for, 753
Aqueduct, New York, extra in, 396
Arbitration, a tribunal of, 899
Arbitrations: as to main road maintenance, 798; as to repairs and fixtures, 795; Ifra-combe, 269; Leytonstone, 209; London tramways, 165, 233, 833; Salford, 233; Watton, Liverpool, 234
Arbitrator, fitness of, 823
Arbitrators: award upheld, 793; fees, taxation of, 269; interested, 164
Arbroath church, burning of, 726
Archaeologia Oxoaniensis, 8
Archaeological: association, British, 283, 336; institute, royal, 211; society, Kent, 105
Archaeology, Suffolk institute of, 88
Arches, of large span: iron, 413, 438, 558, 697, 902; stone, 231
Architect: and client, 131 (alleged collusion between) 33 (in litigation) 688; and contractor, curious action by, 793, 827; and his dust bin, 165; and surveyor, action against, 726; and the jeweller, 654; charged with slandering a builder, 165; convicted of assault, 793; specialists, 763; the "stickit," 727; troubles of a person who has his own, 763
Architects: acoustic advertising by, 59; action against builder, 198; American (institute of) 726 (on competitions) 720; and pupils, 34, 47; and surveyors' society (Sheffield) 561, 685; British, royal institute, 3, 692, 798, 869 (examinations) 32; certificates, finality of, 93; charges, 654 (for alternative plans) 753; claim (for commission) 289 (for fees) 725; congress, Chicago, 306; fees, 805, 755, 900; gardens, garden design and, 282; institute (Glasgow) 734; library, an American, 416; names on buildings, 760; not personally liable, 549; professional tax on, 655; prospects in Australia, 375, 655; pupils in Scotland, disadvantages of, 235; reference library, 341; registration (bill) 31 (in Victoria) 651, 620; seaside, 724, 791; society, 511, 683, 694, 764, 833 (excursion to France) 28, 293 (do. Manchester) 511, 625, 858; sued by builders, 305; taking out their own quantities, 557; Victorian institute, 339
Architectural: antiquities of Isle of Wight, 555; association, 445, 588, 653, 728, 799, 893 (brown book) 483, 847 (conversations) 649 (election of committee) 160 (excursion to Taunton) 163, 204, 239, 279 (Lyric club) 790 (medal) 514 (photo-graphs) 441 (do. Birmingham) 685, 638, 685, 722, 897 (do. Edinburgh) 685, 897 (do. Glasgow) 40, 351, 442 (do. York) 825; design, some first principles of, 832; drawings, rends of, 370, 649, 872; education, notes on application of, 658; examination programmes, 2; history, a neglected chapter of, 452; societies (Leeds and Yorkshire) 734, 835, 897 (Liverpool) 493, 611, 734; survivors, 657; tour in 1834, 67, 137; tourists, 237
Architecture: an art, a science, and a profession, 484; and building construction at King's College, 519; applied, 482; a profession or an art, 554, 582; dictionary of, 104; Dundee institute of, 734, 936; fifteenth century, 89; Gothic, 873; iron in, 276; modern, some mysteries of, 728; of angles, 307; of Scotland, castellated and domestic, 206; of Shakespeare, 314
Area of building, covering with concrete, 653
Arithmetic for schools, 350
Armchairs, French, 489
Arnaud, Léon, presentation to, 688
Arrangement, interior, of theatres, 65
Arson, builder charged with, 233
Art: applied (lectures on) 514 (school of Edinburgh) 375, 549; exhibitions (Belgian, Earl's Court) 103 (London school board) 102; in iron roofs, 481; Japanese, 549; of inconspicuousness, 411; or profession of architecture, 554, 582; science and profession of architecture, 484; students, pocket manual for, 130; work-a-day, 615; workman, openings for the, 557, 685
Artisans' dwellings: Goldsmith-square, 685; Salford, 869
Art and fresco workers' union, 535
Artistic fellows and ordinary members, 598
Artists, British, society of, exhibitions, 632
Arts and crafts exhibition, Sydney, 795; society of, 723
Arundel-street, Strand, transformed, 129
Assailants and apologists of the Institute, 791
Assembly rooms, Ambleside, 516
Assistant, the decorator's, 850
Assize courts, Birmingham, 829
Associations: archaeological (British) 233, 336; architectural, 445, 588, 653, 728, 799, 893 (brown book) 483, 517 (conversations) 649 (election of committee) 160 (excursion to Taunton) 163, 204, 239, 279 (Lyric club) 790 (medal) 514 (do. Birmingham) 685, 638, 685, 722, 897 (do. Edinburgh) 685, 897 (do. Glasgow) 40, 351, 442 (do. York) 825; British, at Edinburgh, 198, 202; master builders (Birmingham) 722 (Leicester) 163 (National) 211, 235 (Preston) 561 (York) 245; master slaters, 882; municipal engineers, 102, 163, 409; sanitary inspectors, 722
Asylums, lunatic: Coxlodge, Newcastle, 175, 455; Gattloch, Glasgow, 655
Athens, British school at, 83
Austin, H. G., Canterbury, the late, 162
Australasia, sanitary crusade through, 310, 316, 380, 623
Australasian surveyors' conference, 864
Australia, architects' prospects in, 375, 655
Award, BUILDING NEWS designing club, 627
Aylesbury extension, Metropolitan railway, 336, 372
BACK gardens, buildings in, 128
Bad: concrete, 619; house drainage, 411, 584; mortar, 619, 853
Baird, Thompson and Co., 653
Baker, W., in re, 839
Balmoral and river pollution, 620
Bankrupt, undischarged, curious action by, 653
Banks: Cornhill, E.C., 722; Eastbourne, 665; Hereford, 476; Newport, Mon., 336
Barcelona art exhibition, 316
Barclay, Hugh, Glasgow, the late, 783
Bath: house, seaside, club designs, 205; municipal buildings, 306, 476; tidal river, 643, 618, 652
Baths and washhouse, public, 230, 475, 730; Aston, Birmingham, 581, 701; Bitley, 67, 859; Brixton, 162, 755; Chelsea, 791; Coventry, 618; Edinburgh (Drum-heugh) 30; Gosse-green, Dalwhol, 67; Islington, 163; Kingston-on-Thames (swimming) 211; Rotherham, 617; St. Saviour, Southwark, 617, 621; Walsall, 518, 583, 617, 651, 755, 867
Battersea, Albert palace, 620, 765
Beaumont, F.E., in re, 828
Beauty of London, what have we to do with the, 692
Bedding iron on stone, 478
Beds, concrete and the building act, 534
Beginning at the wrong end, 553
Be fast, municipal engineers at, 409
Belgian art at Earl's Court, 103
Benevolent institution, builders' 136, 689, 795; clerks do, 795
Bennett, G. F., Birmingham, in re, 863
Berg, Charles, 334, 373
Berridge bequest, 550
Bexhill town hall competition, 665, 825
Bickelsteth, Dean, the late, 545
Bickley, railway widening near, 553
Binding character of architects' certificates, 93
Birmingham: architectural association, 385, 628, 685, 722, 897; art gallery catalogue, 833; art exhibition, 306, 338; assize courts, 829; guild of handicrafts, 514; master builders' association, 722; rechanneling the river Lea, 407; school of art, 375; water supply, 234
Bishopsgate institute designs, 202
Bisnet, J. H., Aberdeen, the late, 788
Black and white, two exhibitions in, 804
Blackboard composition, 93
Blackburn water supply, 234
Blackpool tower, 230, 372
Blast, sand, for cleaning walls, 166
Bleibtreu, Geo, the late, 559
Block and quadrangle, the, 98
8 Oaks, road and footway, 555
Blotting case, drique, 833
Blount door spring and check, 825
Board schools: Batley, 859; Birmingham, 287, 722; Bromley, Priory-grove (competition) 655, 683, 880, 897; Carlisle, 895; Coventry, 30; Douglas, I.M., 40; Edinburgh, 302; Gateshead, 793; Manchester, 442 (do. Chetham, higher grade) 561 (do. technical) 551, 377, 421; Morthy, 366, 351; Norwich, 545; Salford, 477; South Shields, 334, 412; Stockton (higher grade) 548, 617; Walsall, 837; Wombwell, 40
Boasting, 618, 653, 686, 757, 792
Boathouse, Coombe-park, 315
Bolton, reservoir, pollution at, 94
Bolt in stone, holding power of, 129
Boller: masonry, cracking of, 93; pipe, diameter of, 304
Books for student surveyors, 478
Borough-road Polytechnic, 439
Boston, Mass., building law for, 166
Botanic gardens, Edinburgh, 235
Bottom v. York corporation—contractors' liability, 126, 128
Boundary wall, new lights in, 636, 724
Boyle, R. and Son, Limited, 627, 729
Bradford, the privy system at, 303
Breaches: of bylaws, 613, 724; contract, carpenters sued for, 499
Breaking weight, 753, 792, 827
Brick: and terra-cotta, Ruben, 615; and tile iron frame, 911; an expensive, 899; making in Western Mongolia, 655; summerhouse, 351
Bricks: 653; and joints in brickwork, 335, 400, 621, 618, 693; vitrified, for street paving, 864
Brickwork: 125; joints in, 335, 496, 621, 618, 693
Bridge building case, 127
Bridges: Cincinnati (over Ohio) 734; Focholich (suspension) 544; Ratcliff and Rotherhithe (proposed) 823; Tower (approaches) 95; Vauxhall (new) 454
Bristol municipal building, 335
British: archaeological association, 283; architects, royal institute, 3, 692, 798, 839 (examinations) 32; artists' society exhibitions, 35, 622; association at Edinburgh, 198, 202; institute of health, 165; library plans for exhibition at Chicago, 443; school at Athens, 83
Brixton: baths, 162, 755; Hill, Raleigh estate, 95
Broadway, the Council, 691, 756
Bromley board school competition, 655, 683, 860, 897
Brooklyn, relief sewer at, 232
Brown book, archt. assocn., 483, 547
Bruce, Robert, Dundee, the late, 162
Bruton water supply, 794
Buckhaven sewerage scheme, 234
Builder: and his insinuating property, 724; and solicitor, serious charge against, 812, 937; architect's action against, 198; bankrupt, conviction of, 793; brings slander action against architect, 165; charged (with arson) 233 (with fraudulent bankruptcy) 618; damages against, 519
Builders: action against architects, 805; and florist, 793, 901; benevolent institution, 136, 683, 795 (clerks do. do.) 795; claim, 127; clerk, charge against, 819; evidence at the Labour Commission, 732; exchange and "blackleg" contractors, 726; jerry, bylaws and, 167; London County Council as, 555, 621; master, associations (Birmingham) 722 (Leicester) 163 (National) 211, 235 (Preston) 561 (York) 245; rival, 725
Building: act (buildings in back gardens and) 128 (clerks of works offices and) 338 (exemption under) 794 (existing streets and) 687 (for Liverpool) 375 (internal alterations and) 33 (owners under) 937 (railway cottages and) 33 (railway stations and) 95 (timber stages and) 338, 444 (warehouses and) 513, 653; agreement, mortgage of, 852; bylaws, 902 (in rural districts) 410; construction (advanced) 649 (at King's College) 519 (lofty) 104 (sanitary) 794; contract, a, 374; estate, 126; is a glasshouse, a, 619; is a timber stage, a, 338; land, taxation of, 204; law (Boston, Mass) 166 (London) 61; materials (exhibition in Lemberg) 34 (property in) 233; News designing club, 205, 551, 421, 450, 908 (award) 627; Nonconformist church, 753; owner of a club, who is, 759; rapid, in Chicago, 335; societies, law of, 498; trade guilds, medieval, 514; what is, a, 444
Buildings: ancient, socy. for protection of, 31; architects' names on, 760; Chicago exhibition, 68; corner, maximum height of, 725; cubing, 758; decoration of, 517; division of, 632, 753; echo in, 789, 826, 881; height of, in Chicago, 140; in back gardens, 123; many-storied, 443; temporary, 554
Burning of New York Opera house, 445
Burton Lintimer, sewerage of, 444
Bury Corporation fined for river pollution, 584
Business premises: Bishopsgate Within, 233; Cheapside, 875; Chester, 561; Leeds, 91, 124; Sheffield, 442
Burslem, public improvements at, 130
Bust, Duke of Clarence, York, 69
Butler v. Pember, 33, 127
Bylaws: and jerry-builders, 167; breaches of, 513, 724; building, 902
CABINET, 421
Cable tramways: Matlock, 560; Streatham, 830
Camera club's exhibition, 615
Canal, Manchester ship, 268
Candidates, parliamentary, 54, 59
Canterbury, ancient paintings at, 635
Cardiff: public buildings for, 34; water supply, 444
Carpenter and joiner, the, 833
Carpenters: a company (architectural classes) 166 (lectures) 653, 794, 829; sued for breach of contract, 499
Carpentry and joinery, 7, 161, 693
Carroons, duplicate, by Lifford, 375
Carvers' right to charge for steam power, 862
Castellated and domestic architecture of Scotland, 206
Cast iron arches, large span, 413, 438, 558, 697, 902
Castles: Edinburgh, 581; Hurstmoor, 701; Stirling, 375
Catalogues, Birmingham and Glasgow—Art Gallery, 333
Casana, pink mortar of, 166
Cathedral: Antwerp, 875; Canterbury, 936; Coutances, 421; Durham (Light-foot mss.) 619; Edinburgh (St. Giles, Inglismant) 515; electric lighting for, 665; Kilare (St. Bridgid) 267; Lichfield, 631; Manchester, 90, 616, 659, 936; New York (St. John Divine) 936; Oxford, 629 (pre-Norman window at) 350; Rochester, 232, 617; St. John's, Newfoundland, 95; St. Paul's (Wellington, Mont.) 438, 630; Salisbury (spire) 911; Vienna (St. Stephen, electric lighting in) 655; Victoria, British Columbia, 105, 477, 595, 756; Winchester, 520
Cement, waterproof, 900
Cemeteries: Bowling, Bradford, 267; West Derby (R.O.) 332
Censure on a local board, 94
Century of progressive geological science, 196
Certificate, architects', finality of, 93
Chaffor, W. H., Birmingh., in re, 164
Chaining on slopes, 101
Champion combination water-closet, 874
Chapels: Ainsworth (Meth. New Con.) 896; Bayswater (convent) 231; Blackburn (Bapt.) 665; Black Heath, Womersley (mission) 489; Bowling, Bradford (convent, R.C.) 267; Dartford (F.C.) 546; Durham (Univ. coll.) 875; Folkestone (school) 511; Goring, 442; Gray's-inn, 31, 34; Invergowie (All Souls) 561; Leeds (Blenheim) 859 (Oxford-place) 616; Mevagissey (West.) 163; Radwin (Bapt.) 755; Roth (Lady) 51, 315; Welbeck, Abbey, 830
Chapter, a neglected, of architectural history, 452
Charges: and expenses, railway, 125; architect's, 651; surveyors', 758
Charing Cross to St. Paul's, 650
Check, Blount door spring and, 825
Cheika, Wm., Hereford, the late, 174, 234
Chelsea baths competition, 791
Cherbourg, export of macadamised stone from, 59
Chester "Rows," the, 337
Chicago, architects' congress, 306; exhibition (buildings) 69 (library plans for) 443; height of buildings in, 140; rapid building in, 335
Chimney-piece, East Quantoxhead, 595
Chimneys, tall American, 375
China, economical construction in, 33
Chinchen, J., of Cowes, in re, 899
Christ hospital competition, 826
Church: building, Nonconformist, handbook of, 731; restoration without a faculty, 33, 479; wall decoration, 825
Churches: Abbeyle, Sheffield, 447; Addlestone (St. Paul) 805; Aldershot (St. George, military) 30; Arbroath (burning) 723; Arundel (re-roofing of) 794; Avonmouth (St. Andrew) 722; Barnardston, Newport (St. Matthew) 476; Bedfordpark (Chiswick) St. Michael) 355; Belminster, Bristol (St. Paul) 791; Bergen, 334, 373; Bexhill (St. Peter) 635; Birling (district) 421; Bourton-on-Hill, 263; Braiford (St. Clement) 511; Brixton (St. Matthew) 235; Browdaire, Preston (St. Mary, R.C.) 267; Canterbury (St. George) 511; Camberwell (St. Giles) 655; Chacewater, 936; Chailock, 196; Chilworth (Franciscan) 30; City (Old Fish-st., St. Mary Magdalen) 769; Crawshaw-booth, 643; Daffown (Free) 193; Dalwhol (St. Barnabas) 231, 665; Duncton, 695; Earlsdon, 91; East Barry (St. Paul) 791; East Langdon, 43; Edinburg (Spice, St. Paul) 616; Elmley Castle (St. Mary) 735; Great Crosby (St. Peter and Paul, R.O.) 30; Gualva, 681; Ham-hill, Kent (Christ) 111; Hartlepool (St. Hilda) 518; Haydock, 57; Henshaw, 631; Hither-green, Lewisham (St. Swithin) 91; Holborn-viaduct, E.C. (St. Sepulchre) 162; Jersey (St. Aubyn) 631; Kidderminster (St. John Bapt.) 616; Kingstown,

- Dublin (St. Michael, R.C.) 231; Larg (U.P.) 445; Leigh Woods, Bristol (St. Mary) 618; Leominster, Sussex, 701; Lincoln (St. Hugh, R.C.) 755; Linthorpe (St. Barnabas) 755; Liverpool (St. Saviour) 39; Llanerchaw, 163; Lynton, 231; Manchester (St. Ann) 755; Mawdesley, 723; Mold (Eng. Presb'tn) 755; 790; Newcastle-under-Lyme (St. George) 547; New Shoreham, 451; Nicholaston, 701; Northborough (St. Andrew) 124; orientation of, 881; Oxford (St. Mary) 859; Paington (St. Andrew) 547; Penarth (All SS.) 9; Plymouth (St. Peter) 825; Richards Castle (Foster meml.) 723; Roath (St. Peter) 31, 315; Rosagah, 335; St. Gilles, Caen, 769; Salt (St. James) 631; Shrewsbury (St. Mary) 91; Small Heath, Birmingham (Saint Oswald) 442; Stanton-on-Hine Heath, 723; Steppney (St. Philip) 617, 789, 805, 875; Tenby (R.C.) 267; Tonge Moor, Bolton (St. Augustine) 175; Upper Poppleton, 91; Upton Bishop (restoration dispute) 33, 47; Warrington, 53; Wenboston (panel painting in) 477; West Battersea (Sacred Heart, R.C.) 232; West Derby (Cemetery R.C.) 302; West Dulwich, 351; Weston-super-Mare (St. Saviour) 875; Wiggenhall (St. Mary, alleged Vandalism) 836; Wribbenhall, 805
- Churchwarden's responsibility for repairs, 33, 127
- Circulation of underground waters, 203
- Cistern, 653
- City, the: electric lighting in, 129, 664; fees for hoardings in, 409; Guildhall, 312, 373; of London college, 410
- Claim: and counter-claim, Pike v. Boyers, 899; architects' (for commission) 269 (for fees) 725, 728; by a builder, 127
- Clapham-junction and Paddington subway, 864
- Cleansing and ventilation of sewers, 509
- Cleaver, Wm., the late, 721
- Cleckheaton, sewage purification, 305
- Clegg v. Okonite Co., architect's commission, 269
- Clergy house, A'friston, 407
- Ceryman and theatre lessee, action between, 828
- Clerk of works: and his duties, 1; office and the building act, 338
- Clerks, builders', benevolent institution, 795
- Client and architect: 131; alleged collusion between, 33
- Clients, amateurs as, 451
- Cliftonville, Llanos, 165
- Clock tower, Salisbury, 211
- Closet: seat, new, 523; water (champion) 874
- Clubs: A.A. Lyric, 790; Bramley (libl.) 559; Brooklyn (Montauk) 625; BUILDING NEWS designing, 205, 351, 421, 450 (award) 627; for juniors, 233; Holborn (Union) 455; Junior Constitutional, 826; Marlow, 629; who are the building owners of, 759
- Coach-house, rain in, 93
- Coast lines, development of, 202
- Coals, induction, 350
- Cold meat store, largest in the world, 370
- Coles, W., Winchester, in re, 937
- Collapsing of flooring at Glasgow, 264
- Colleges: Asptria, 936; Bangor (training) 911; Birmingham (Mason's) 267; Bristol (Univ.) 755; Brondesbury (Grey training) 421; City of London, 410; Darham (Univ., Chapel), 875; (Univ.) 859; London (Univ., architecture prizes), 69 (chair of Egyptology) 794; Newcastle-on-Tyne (science) 211, 443, 511, 859
- Collusion between client and architect, 33
- Colonial membership, surveyors' institution, 836
- Columns, carved wooden, 735
- Combination water closet, Champion, 874
- Commission: architects' claim for, 269; for sale by private contract, 584; house agent's, 59; Labour, builders' evidence at, 732
- Committee: A.A., election of, 160; select, on theatres, 245, 273
- Competition drawings, national, 478
- Competitions: 53; American architects on, 720; assembly rooms (Ambleside) 548; asylum (Oxbridge, Newcastle) 176, 455; baths (Brixton) 162, 755 (Chelsea) 791 (Kingston-on-Thames, swimming) 211 (Rotherham) 617 (Southwark) 617, 621 (Walsall) 546, 583, 617, 651, 755, 867; board schools (Bromley, London) 655, 693, 860, 897 (Gateshead) 790 (Manchester) 442 (Merthyr Tydfil, intermediate) 351 (Norwich) 546 (Salford) 477 (South Shields) 384, 442 (Stockton higher grade) 546, 617 (Walsall) 897 (Wombwell) 40; bourse (Philadelphia) 199; BUILDING NEWS designing club, 205, 351, 421, 450, 908 (award) 627; bust (Duke of Clarence, York) 69; cathedral (Victoria, Brit. Columbia) 106, 477, 595, 796; chapels (Blackburn, Bap't.) 665 (Goring) 442 (Gray's Inn) 31 (Roath, Ldy., to St. Peter's) 31, 315; church (Abbeylea, Sheffield) 442; clock tower (Salisbury) 211; club (Bramley Libl.) 553; county council offices (Stafford) 162 (Wakefield) 723; disinfectoria in, 35; essays on road construction (New York) 130; hospitals (Alloa, fever) 723 (Cade Town, quarantine) 105 (Christ) 826 (Kelighy, fever) 510, 553, 769, 826 (Paddington, St. Mary) 545, 551 (Sydney, scandal) 270; infirmaries (Manchester royal) 162, 245 (Southport, centenary) 245; institute (Bishopsgate) 202; lodging houses, municipal (Newcastle-on-Tyne) 233; Masonic hall (Newcastle-on-Tyne) 723; Mulready prize, 911; municipal buildings (Oxford) 31, 40, 69, 141 (St. Pancras) 629; National, schools of art, 131; oilless, local board (Crompton) 860 (Hoylake) 40 (Hilford) 685, 893, 897 (Shepton Mallet) 546; Owen Jones' prizes, 723; polytechnic (Clerkenwell) 477; public buildings in United States, 235; public libraries (Gorton, Manchester) 211 (Poplar) 32, 525 (Southwark) 510, 517 (Widnes) 546; schools (John-st., W.C. Sunday) 405 (Walthamstow, industrial) 860; sewage scheme (Moulmarayd) 825; statue (Burns, Chicago) 755; technical schools (Aberdare) 723 (Accrington) 855 (Birmingham) 825 (Douglas, L.M.) 40 (Maidstone) 595, 629 (Manchester) 351, 377, 421, 455, 489 (Radcliffe) 897; town halls (Bexhill) 665, 825 (Kilmarney) 755 (Llanelli) 315, 477, 545, 547 (Newcastle-on-Tyne) 629 (Walsall) 105, 193, 211, 385, 723, 860, 867; workhouses (Knutsford) 195 (Tottenham) 105
- Composition for renovating stonework, 405, 478
- Compressed air tramway, 655
- Concrete: beds and the building act, 534; covering area of building with, 653; first used Millbank prison, 900; poor, 619
- Condition, sanitary, of our towns, 337
- Conditions of contract in Q. Zealand, 166
- Conductors, lighting: 543, 650; new coupling for, 760; soil pipes as, 203; Coney, W. F., in re, 269
- Conference, Australasian, surveyors, 834
- Congresses: architects', Chicago, 336; hygiene, Dublin, 165, 305; plumbers', Dundee, 306, 406; sanitary, Portsmouth, 370, 405, 415
- Constantine v. Brown (architect's non-liability for orders) 549
- Construction: advanced building, 649; and interior arrangements of theatres, 65; dyke, in Holland, 553; economical in China, 38; incombustible, 343, 408; lofty building, 104; of covenants, 937; of cranes and lifting machinery, 90; sanitary building, 794; steel in, 303
- Constructional drawings, 416
- Continuation schools, manuals of, 650
- Contract: a building, 374; conditions of, in Queensland, 166
- Contractor and sub-contractor, 126
- Contractors: refuse a legal nuisance, 123; risks, 126, 128; the London county council as their own, 555, 621
- Contracts: co-operative, in New Zealand, 514; for works and services, 653
- Contributory negligence, 513
- Convalescent homes: Perranporth, 191, 315; Sandgate, 30
- Convent, Bayswater (chapel) 231
- Conversazioni, archl. assocn., 549
- Co-operative: contracts in New Zealand, 514; stores, Preston, 755
- Corner buildings, maximum height of, 725
- Corn exchange, Reading, 476
- Cornice: overhanging, 653; stone, measuring, 164
- Corwall railways, 230, 617
- Cost of electric light supply, 638
- Cottage hospitals: Horsham, 51; Market Drayton, 163; Wellington, Somt., 91; Willesden, 595
- Cottages: Longford, Kent, 769; Preston-brook, 934; railway, and the building act, 33
- Council Broadway, the, 691, 756
- County Council offices: Stafford, 162; Wakefield, 723
- Couplings, new lightning conductor, 760
- Court, the Inns of, 628
- Courts: assize (Birmingham) 829 (York) 532; police (Wandsworth) 9; teams, 618
- Covenants: construction of, 937; restrictive, 268
- Coventry, old hospitals, 839
- Covered way, 753
- Covering area of building with, 653
- Coverings, roof, 201
- Cracking of boiler masonry, 93
- Cranes: and lifts, construction of, 90; stresses in, 373
- Cranston, Isaac, in re, 513
- Crieff water supply extension, 231
- Cromer water supply, 94
- Crosby hall, 270
- Cross actions as to sewage disposal, 91
- Crowds, weight of, 838
- Crusade, sanitary, through the East and Australia, 310, 346, 380, 628
- Crypt, Mont St. Michel, 421
- Cubing buildings, 758
- Cumberland, Roman remains in, 510
- Cunliffe v. Hampton Wick local board, 94
- Curatorship, Soane museum, 664, 825
- Curious action: between theatre lessee and clergyman, 828; by architect and contractor, 793, 827; by undischarged bankrupt, 653
- Cylinders and tanks for hot water works, 906
- DAMAGES for: extraordinary traffic, 444; false imprisonment, 654
- Damp walls, 792
- Daylight in the dwelling, 799
- Deadening sound, 851
- Deaf and dumb schools, Preston, 511
- Decoration: 89, 99; church wall, 825; of buildings, 617
- Decorations at the Alhambra, 440
- Decorative: lighting and ironwork, 278; paintings at the Academy, 105
- Decorator's assistant, the, 350
- Defects in the employers' liability act, 653
- Deluge adamant, Twyford's, 553
- Dennes v. Gould, mortgagee v. surveyor, 259, 654
- Dennis v. Crocker, architect and client, 688
- Departing from specifications, penalty of, 444
- Desiderata: in competitions, 35; in physical laboratories, 203
- Design: architectural, first principles of, 332; gardens, and architects' gardens, 252; vicarages, 831, 897; window, 737
- Designing club, BUILDING NEWS, 205, 351, 421, 450, 908 (award) 627
- Designs: baths (Walsall) 837; BUILDING NEWS club, 205, 351, 450, 908 (award) 627; hospital, St. Mary, Paddington, 551; institute, Bishopsgate, 202; Japanese stencil, 835; liability for, 91; local board offices, Ilford, 896; national competition of schools of art, 131; public library (Southwark) 510, 517; royal academy prize, 833; technical school, Manchester, 377; town halls (Llanelli) 545 (Walsall) 837
- Destructors, refuse, electric lighting and, 203
- Details and tenders, 901
- Development: of coast lines, 202; town, some problems of, 793
- Diaries and almanacs, new, 874
- Dictionary of: architecture, 104; mechanical engineering terms, 734
- D'Isibuties, Severn tunnel, 140
- Dimmock, Jos., Stoke-on-Trent, the late, 476
- Dinners: builders' benevolent institution, 633; society of architects, 695; society of engineers, 837
- Discharge and storage of rainfall, 3
- Disposal: refuse, 663; sewage, 197
- Dispute as to quitting a quarry, 164
- Distance, inaccessible, 32, 58
- Distemper, washable, 827
- District surveyor: and his deputy, 862; fined for defrauding a railway company, 404, 409, 480, 724
- Division of buildings, 692, 756
- Docks: Avonmouth, Bristol, 477; Preston (Albert Edward) 80; West India, 896
- Domestic: architecture of Scotland, 206; sanitary appliances, 347; work in stone, suggestive, 175
- Door spring and check, Blount, 825
- Dore and Caimley railway, 617
- Dorking sewerage, 414
- Doulton ware, exhibition of, 729
- Dover, proposed promenade, 756
- Drainage: 123; and plumbing specification 532, 765, 826, 861, 895, 998, 938; bad, liability for, 534; house, 758, 792; (alleged negligence in) 305 (bad) 411; of houses 618, 653
- Drains, and scarlet fever, 683; testing, 478, 512, 548, 683
- Draughtsman, the ornamental, 650
- Drawings: and specifications, working 412; architectural rendu of, 379, 649, 872; constructional, 416; by Ingigo Jones, 629; national competition, 478; ownership and return of, 342
- Drique blotting case, 838
- Drury-lane municipal lodging-house, 336
- Dry rot: 652; cheap cure for, 409
- Dublin: institute of health at, 165, 305; markets, 546
- Dubrot brick frame, 911
- Dudley gallery exhibition, 729
- Dundee: institute of architecture, 734, 936; plumbers' congress, 306, 406
- Duplicate R. d'Isibuties cartoons, 375
- Durbain, architect and his, 165
- Duties, clerk of works and his, 1
- Dwelling, daylight in the, 799
- Dwellings: artisans' (Goldsmith-square) 555 (Salford) 860; drainage of, 618, 653; industrial, Oxford-st., W., 629; seaside, 448
- Dyke construction in Holland, 557
- EARL'S COURT, Belgian art at, 103
- Earth and grass roofing, 140
- East: Langdon church, 443; the, sanitary crusade through, 310, 346, 380, 628
- Eastwood and Greasley sewerage, 444
- Ecclesfield, sewage disposal at, 165, 863
- Echo in buildings, 789, 827, 861
- Economical: construction in China, 384; moving houses is, 756
- Edinburgh: arbitration at, 513, 549; archl. assocn., 685, 897; Botanic gardens and Arboretum, 235; British association at, 196, 202; municipal improvements in, 445; notes from, 57, 520; restoration of Parliament hall, 591; school of applied art, 375, 549; sewerage, 937; water supply extension, 32
- Education, architectural, notes on application of, 658
- Egyptology at University college, London, 794
- Election of A.A. committee, 160
- Electric: action, lead pipes destroyed by, 445; light (fittig, practical) 838 (popularly explained) 350 (supply, cost of) 688 (use and production of) 733; lighting (and refuse destructors) 203 (for cathedrals) 655 (Glasgow) 910 (in the City) 129 (Smithfield markets) 634 (switches) 373; railways in London, 954
- Electrical transmission in Rome, 864
- Ellis v. London County Council, 687; v. Strand board of works, 165
- Ely, Gardiff, sewerage of, 270
- Emery v. Cafe, 305
- Employers' liability, 94, 126, 165, 233, 513, 619; defects in act, 653
- Encroachments on streets, gardens as, 549
- Engineering: appeal, a Manx, 33; science, prospects of, 203; society, Liverpool, 31; terms, mechanical, dictionary of, 734
- Engineers: association, municipal, 102, 163, 409; mechanical, institution of, 137; society of, 103, 457, 684, 837 (transactions) 104
- England, water-colour painting in, 5
- Entrance hall, warming, 53
- Epitaphs on architects, 617
- Erecting wooden structures without licenses, 128
- Estate building, 126
- Europe, illustrated, 210
- Everard, Christopher, in re, 584
- Evesham sewage works, 794
- Evidence, builders', at the Labour Commission, 732
- Exaggeration not a false pretence, 937
- Examination programmes, architectural, 2
- Examinations: plumbers', 733; R.I.B.A., 32; sanitary inspectors', 95; surveyors' institution, 95
- Exchange: builders', and blackleg contractors, 726; corn, Reading, 476
- Exclusiveness, professional, 61
- Excursions: Architectural Association (Somerset) 163, 204, 235, 279 (photographs) of 441; Society of Architects (France) 23, 233
- Exemption under the building act, 794
- Exhibitions: art (Belgian, at Earl's-court) 103 (Birmingham) 303, 333 (London school board) 102 (Manchester) 338 (Nottingham) 445; arts and crafts (Sydney) 735; Barcelona, 336; building (Lemberg) 34; Chicago, 63 (library plans for) 443; Doulton ware, 729; Dudley gallery, 729; health (Nottingham) 126; home arts, 69; in black and white, two, 804; institute, oil colour painters, 622; laundry, 338; Mendoza's black and white, 804; New York architectural league, 938; photographic (Camera club) 615 (in Pall Mall) 452 (Somersetshire) 441; royal societies (British artists) 35, 622 (water colour painters) 763; Vierge's drawings for Pablo, 804
- Existing streets and the building act, 637
- Expenses: and charges, railway, 125; private street works, 618
- Export of French macadamised stone, 59
- Extraordinary: charge against local board surveyor, 619, 653; traffic, damages for, 444
- FACTORY and workshop act, 1891 notes on, 172
- Faculty, church restoration without a, 83, 479
- False imprisonment, damages for, 651; pretence, exaggeration not a, 937
- Fares and travelling time for workmen, 654
- Faster, sash, Rogers's, 8
- Fees: arbitrators', taxation of, 269; architects', 505, 725, 758, 909; claims for, 727; for advertising hoardings, 409; measuring, 548
- Fellows, artistic, and ordinary members, 553
- Fever hospitals: Alloa, 723; Keighley, 510, 559, 769, 826; Stamford Hill, 512
- Fever, scarlet, drains and, 658
- Fifteenth century architecture, T. G. Jackson on, 89
- Fifty years of the water cure, 664
- Filtering water, 29, 37
- Filtration of sewage, 203
- Finality of architects' certificates, 93
- Fire: proof floors, 656, 724; station, Gray's 459
- First principles of architectural design, some, 832
- Fitness of arbitrator, 828
- Fittings, electric light, 833
- Fixtures, arbitrations as to, 725, 937
- Flexible metallic tubing, 203
- Flooring, collapse of, at Glasgow, 264
- Floor, salon, 126
- Floors, fireproof, 635, 724
- Florist, builders and the, 793, 900
- Flow, ordinary, of a river, 62
- Flush tank closet, McRill's, 910
- Footway and road blocks, 555
- Footways and streets, our, 89
- Formal garden, the, 869
- Formation of a master slaters' association, 882
- Foster: A. East Grinstead, in re, 414; v. Farquhar, drains and fever, 693
- Foudroyant, rescue of the, 549
- Fowler, Jas., Louth, the late, 545
- Frame, Dubrot brick and tile, 911
- Framing, 758
- France: H. junr., the late, 721; rivers and canals in, 655; society of architects, projected excursion to, 23, 233
- Frauds, alleged advertisement, 59, 127
- Free libraries: Ayr, 459; Bockingham Palace-road, 701; Gorton, Manchester, 211; Lewisham, 351; Poplar, 31, 525; Southwark, 510, 517; Stoke Newington, 141; Whitechapel, 595; Widnes, 546
- Fresco workers' union and the artist, 535
- Frisky, Chilverton (Fraunces) 30
- Front, stucco, 686
- Fuenterabia, 351
- Full or short specifications, 657
- Furniture: and woodwork, 829; at home arts exhibition, 69; illustrated history of, 174; sketches, 141, 490, 839
- Future of Palestine, 104
- GALLAND, Pierre, the late, 824
- Galleries: Birmingham art, 835; Dudley, 729; Glasgow art, 838; National, 95
- Garden: design, an architect's garden, 232; J. H., in re, 619; the formal, 869
- Gardens: architects', garden design and, 252; as encroachments on streets, 549; back, buildings in, 123

Gardner, Wm., Eastbourne, in re, 269
Gas: tank, Glasgow, 230; works, Aberdeen, 372
Gate, east, Rochester, 525
Gentleman's Magazine library, 350
Geological science, century of progress in, 198
Germany, North, holidays in, 210
Ghizeh museum, 829
Gibson, J., F.S.A., the late, 930
Gilbert, A. R., 864
Gilechrist, T., Coatbridge, the late, 476
Girders, strains in, 937
Glasgow: architectural assocn., 40, 361, 442; art gallery catalogue, 838; collapse of flooring at, 264; electric lighting of, 910; institutes (architects) 734 (measurers) 511; municipal buildings, dry rot at the, 409; vitrified brick paving in, 864
Glasshouse, is it a building, 619
Gledhill, J., the late, 721
Gold medal, R.I.B.A., royal, 3
Goldsmith-square, artisans' dwellings, 585
Gonon, Eugene, the late, 404
Gosford house, N.B., 245
Gothic architecture, 873
Gould's tomb, Jay, 900
Graham v. Newcastle corporation, 164, 479, 862
Grammar of woodwork, 650
Graphic methods, report on, 204
Grass, sand, and earth roofing, 140
Graves, E., G.P.O., the late, 664
Gray, R., Berwick, the late, 628
Gray's-inn chapel, 31, 34
Greasley, sewerage of, 444
Greece and Sicily, temple of, 764
Greenhouse, heating by steam or hot water, 349
Greenslade, J., Stroud, the late, 930
Greenwood, J., in re, 269; John Southport, the late, 360
Grimsby drainage schemes, 234
Grinding money, 655, 937
Grover, J. W., the late, 934
Growth of the metropolis, yearly, 165
Guildhall, the City, 312, 373
Guild of handicrafts, Birmingham, 514
Guilds, medieval building, 514
Gurr, C. R., Fulham, in re, 618

HALF-COSTS of wall to be paid when utilised, 549

Hall, entrance, warming, 58
Halls: Bradford (Prim. Meth. Central) 163; Crosby, 270; Haselley, 526; music, select committee's report on, 245, 273; Welburn, 315
Hammerfest, wooden memorials at, 839
Hampton Wick local board, censure on, 94
Hancox, W., Birmingham, in re, 33
Handbooks: house property, 733; Nonconformist church building, 733
Handicrafts, Birmingham guild of, 514
Hanwell, cross actions as to sewage disposal, 94
Harbours: Dover, 130; Helmsdale, 233
Hard silver-plating, 839
Harrogate, building prospects in, 551
Hartlepool, West, progress of, 129, 726
Hanley water supply, 620
Haymarket, suggested removal of the Academy to, 165
Health: British institute of, 185, 305; exhibition, Nottingham, 126; public, for London, 233
Heating, greenhouse, steam or hot-water for, 349
Height of buildings: in Chicago, 140; maximum, corner, 725
Helliwell, T. W., the late, 174
Hema's horsehoe festival, 829
Hendrick, E., Brussels, the late, 510
Herefordshire noles and corners, 660
Hickman, J., Stretford, in re, 937
Highclere-park waterworks, 479
Highgate sanitary museum, 795, 834, 900
Highways, New York, 130
Hint to advertisers, 126
History: architectural, a neglected chapter of, 452; of furniture, illustrated, 174
Hoarding, advertising, less for, 409
Hobbs, J. W., and Co., in re, 444; serious charge against, 862, 937
Holborn to Strand, new street schemes, 34, 95, 103, 165
Holding power of bolts in stones, 129
Holland, dyke construction in, 555
Holidays in North Germany and Scandinavia, 210
Holly, H. H., New York, the late, 476
Homs: arts exhibition, 69; nurses, Edinburgh infirmary, 936
Homes, convalescent: Perranrorth, 194, 315; Sandgate, 30
Hood, A., Bethnal-green, in re, 654
Hopton Wood stone, 478
Hospitals: Alloa (fever) 725; Cape Town (quarantine) 105; Christ, 826; Coventry (Bablake and Ford's) 839; Dublin (city) 476; Edinburgh (children's) 531; Eborham (cottage) 91; Keighley (fever) 510, 559, 769, 826, 859; Leamington (Warneford) 124; Market Drayton (cottage) 163; Paddington (St. Mary) 546, 551; South London (ophthalmic) 860; Stamford Hill (fever) 512; Sydney (scandal) 270; Toxteth (workhouse) 30; Wellington, Somerset (cottage) 91; West Derby, 582; Willesden (cottage) 595
Hotel de ville, Oudenarde, 69, 315
Hotels: Clacton (Grand) 385; Eastbourne (Grand) 233; Hull (Grosvenor) 231; Manchester (Mosley) 245; Newcastle-on-Tyne (Metropole) 723 (Station) 372

Hot water: or steam for greenhouse heating, 349; works, cylinders and tanks for, 906
Homes: agent's commission, 59; clergy, Afriston, 407; drainage, 758, 792 (alleged negligence in) 305 (edit) 411; property, handbook of, 733
Houses: Alford, 839; Birkdale, 355; Boot-ham, York, 439; Bourne-end, 339; Bromsgrove, 805; Caer-Hun, on Conway, 105; Catton, Norwich, 441; Daisy Hill, Bradford, 421; drainage of, 618, 653; Etchingham-park, Finchley, 9; Eversley, Frodsham, 283; Foxcote, Burhill, 701; Gosford, N.B., 545; Hyde-park-court, 735, 791; insanitary, 305; Mayfair 895; Mottistoun (manor) 617; moving is economical, 756; Northwood, 665; Osborne, I.W. (additions to) 266, 335; Prince's-gate, W., 9; Rouen, 769; Selsdon-park, 141; Seville-street, S.W., 315; Stanmore-hall, 141; Sutton, Surrey, 141; Swedish wooden, 478; Toronto, 525; Weybridge, 769; Whittington (Revolution) 739; Wightwick-manor, 735; Windsor, 789
Hull corporation v. Turner, 59
Hydraulic power in London, 34
Hydraulics, 32
Hygiene congress, Dublin, 165, 305
Hygienic stove, the Wywy, 335
Hypocentral temple, the, 869

ILFORD local board offices, 665, 896, 897
Ilfracombe arbitration case, 269
Illustrated: Europe, 210; history of furniture, 174
Improvements, proposed metropolitan, 874
Impurities of town air, 203
Inaccessibility distance, 32, 58
Incompossible construction, 343, 408
Inconspicuousness, the art of, 411
Indian railways, 306
Indicator, tare, new, 700
Induction coils, 350
Industrial dwellings, Oxford-street, 629
Infirmary: Aberdeen (royal) 581; Manchester (royal) 182, 215; Southport, 245, 287, 649; Stafford (workhouse) 759; Sunderland (eye) 30
Inns of court and chancery, 628
Insanitary houses, 305
Inspectors, sanitary: association, 722; examinations, 95
Instinct, a slumbering, 651
Institutes: American architects, 726; archaeology (Suffolk) 88; architects (British) 3, 662, 798, 869 (examinations) 32 (its assailants and apologists) 791 (do. Glasgow) 734 (do. Victorian) 339; architecture (Dundee) 734, 936; Bishopsgate, 202; health, British, 165, 305; measurers (Glasgow) 611; oil colour painters, 622; royal archaeological, 211; Wolverhampton (St. Peter) 124
Institutions: benevolent, builders', 136, 688, 795 (clerks' do.) 795; mechanical engineers, 197; surveyors', 700, 836, 858 (exams) 95; United Service, 655
Insufficient thickness of walls, 513
Interception of light and air, 534
Interested arbitrators, 164
Interests, reversionary, in rights to light, 725
Interior arrangement of theatres, 65
Internal alterations and the building act, 33
Inverness and Aviemore railway, 92, 372, 560
Ipswich, Y.M.C.A. premises, 511
Ireland and Scotland, tunnel between, 129
Iron: and steel maker, 650; and wood verandahs, 725; arches of large span, 413, 453, 558, 697, 902; in architecture, 276; in stone bedding, 478; roofs, art in, 481; v. stone water pipes, 210, 792
Ironwork, decorative, 273
Is a glasshouse a building? 619; model windmill a sky sign? 94; timber stage a building? 338; urinal necessarily a nuisance? 164, 479, 867
Isle of Man, law proceedings in, 193; of Wight, architectural antiquities of, 555

JACKSON, J. E., Cardiff, the late, 28
Japanese: art, 519; stencil designs, 835
Japanesque, 132
Jarrah block paving, 409
Jerry builders, bylaws and, 167
Joicy v. North Eastern Railway Co., ancient lights, 374
Joinery and carpentry, 7, 161, 693
Joints in brickwork, 395, 406, 521, 618, 699, 701, M., the late, 476
Jones: Inigo, drawings by, 629; Owen, prizes, 723
Joseph, Felix, the late, 303
Junior Constitutional club, 826
Juniors, a club for, 232

KELLY, R., Mexborough, the late, 859
Kent archaeological society, 105
Kettering and Rugby railway, projected, 544
Kynsham sewage works, 794
Kilm for seasoning wood, 95
King's, A., Clapton, in re, 409
King's College: architecture and building construction at, 519; prizes, 523
Kirkstall abbey, repairs to, 510
Kirkwood, Walter, Edinburgh, the late, 244
Knill, Alderman, 488: presentation to, 900
LABORATORIES: 478; physical, desiderata in, 203
Labour: commission, builders' evidence at the, 732; contracts, 653
Lancashire: rivers, purification of, 409; watering place, new, 165

Land: building, taxation of, 204; owners, London, 839; surveying and levelling, 4, 32, 93, 101, 197, 278, 304, 443, 512, 547, 583, 651
Lane v. Kelly, reversionary rights to light, 725
Langdon church, East, 443
Large span arches: iron, 413, 493, 553, 697, 902; stone, 231
Largest cold meat store in the world, 370
Latent weaknesses of structures, 275
Lateral obstruction of light, 615
Laundry exhibition, 338
Law: courts, York, 582; of building societies, 408
Laws, building: Boston, Mass, 166; Liverpool, proposed, 375; London, 61
Lead pipes destroyed by electric action, 445
Leaning tower of Saragossa, 839
Leases and outgoings, 724
Lectures: on sanitary plumbing, 650; to carpenters, 585; to sanitary officers, 480; to working plumbers, 129
Leeds and Yorkshire architectural society, 734, 825, 897
Legal, 33, 59, 93, 126, 164, 198, 233, 263, 305, 337, 374, 408, 444, 479, 513, 548, 584, 618, 653, 687, 724, 758, 793, 828, 862, 899, 937
Legality of master carvers to charge for steam power, 862
Leicester: Corporation v. F. Brown (glass-house) 619; master builders' assocn., 163; square, the story of, 650
Leighton Buzzard water supply, 863
Le Lievre v. Gould, Ilfracombe arbitration, 269
Lemberg, building materials exhibition, 34
Létiang, E., Boston, Mass, the late, 558
Levelling, land surveying and, 4, 32, 93, 101, 197, 278, 304, 443, 512, 547, 583, 651
Leytonstone, arbitration at, 269
Liabilities of local boards, 337
Liability: employers' act, 94, 126, 165, 233, 513, 619 (defects in) 653; for bad drainage, 584; for designs, 94
Libel, surveyor's action for, 687
Libraries, American architects', 416
Libraries, public: Ayr, 489; Buckingham Palace-road, 701; Gorton, Manchester, 211; Lewisham, 351; plans of, for Chicago exhibition, 443; Poplar, 32, 525; Southwark, 510, 517; Stoke Newington, 141; Whitechapel, 595; Widnes, 548
Library: an architect's reference, 341; Gentleman's Magazine, 350
License, value's, 827
Licensing sessions of London County Council, 552
Lichfield cathedral, 531
Liell v. Boulter, commission case, 584
Lifting: machinery and cranes, construction of, 90; v. sliding shutters, 548
Light and air, interception of, 584; electric (fitting) 833 (popularly explained) 350 (use and production of) 733; lateral obstruction of, 615; rights to (Nottingham memorial as to) 759 (reversionary interests in) 725
Lighting: decorative, 278; electric and refuse destructor 203 (cost of) 688 (for cathedrals) 655 (Glasgow) 910 (in the City) 129 (Smithfield market) 664 (switches) 373
Lightning conductors: 548, 650; couplings to, 760; soil pipes as, 203
Lights: ancient, 233, 374, 581; new, in boundary wall, 686, 724
Limitation act, real property, 193
Linear perspective, 8
Linthgow palace, 302
Linzell, F. L., in re, 832
Liverpool: Architectural Society, 490, 511, 734; building act for, 375; engineering socy, 31; landing stage extension, 722; Wynnydd water supply, 94, 101, 860
Livingston, J. B., Scarborough, in re, 863
Llandaff: sewerage, 270, 409; water supply, 409
Llanelli town hall competition, 315, 477, 545, 547
Load, safe, for piles in soft soil, 794
Loans for public works, 306
Local board: censure on, a, 94; liabilities of, 337; offices (club designs) 908 (Crompton) 880 (Hoylake) 40 (Ilford) 665, 896, 897 (Rawmarsh) 826 (Shepton Mallet) 629; surveyor (and builder) 899 extraordinary charge against, 619, 663
Lockwood's dictionary of mechanical engineering terms, 734
Lodge, shooting, Alnabreac, 193
Lodging houses: Drury-lane, 336; Newcastle-on-Tyne, 233; Vauxhall (Lord Rowton's) 896
Lofty building construction, 104
London: beauty of, what have we to do with, 692; building law, 61; county council, 95, 723, 759, 829, 900 (and the Albert Palace) 765 (as builders) 821 (as their own contractors) 555 (licensing sessions of) 552 (new works department) 733, 761; electric railways in, 934; hydraulic power in, 34; land owners, 829; Marl, sales at the, 130; public health for, 233; school board action against 862 (art exhibition) 102 (competition) 655, 698, 860, 897; streets, repairing of, 445; tramways arbitration, 165, 233, 863; water supply, 514
Long Eaton waterworks, 409
Lord Mayor Knill: 438; presentation to, 900
Louvain, Poyers Brothers' atelier, 409
Luke, J., in re, 725
Lunatic asylums: Coxlodge, Newcastle, 175, 455; Gartloch, Glasgow, 685

MACADAMISED stone, export of from Cherbourg, 59
Macclesfield main drainage scheme, 479
Maddonald, Chas., Aberdeen, the late, 545
Machinery, unfenced, 793
Maidenhead, arbitration case at, 93
Main road maintenance, arbitration, 793
Maunder and Kempthorn v. Elliott, 94
Making of private roads and streets, 244
Malorca, sketches in, 335
Manchester: art exhibition, 338; b.d. school competition, 442; cathedral, 30, 616, 859, 938; improvement in St. Ann's churchyard, 769; Newcastle and Glasgow railway, projected, 544; royal infirmary, 162, 245; ship canal, 268; society of architects, 511, 525, 859; technical school, 351, 377, 421, 455, 489
Man, Isle of, law proceedings in, 193
Mansions: Gloucester, Cambridge-circus, W., 701; Hyde-park, 735
Mantelpieces, cast iron, 875
Manual: of continuation schools, 650; pocket, for art students, 130
Manx engineering appeal, 33
Many-storied buildings, 448
Mariners' refuge, Gorseston, 420
Market place, Tübingen, 561
Markets: Dublin, 546; Smithfield (electric lighting) 664
Marten, H. J., the late, 664
Mart, London, sales at the, 130
Morton and Leamington railway, 477
Masonic buildings: Henley-on-Thames, 315; Newcastle-on-Tyne, 723
Masonry: boiler, cracking of, 93; retaining walls, 29
Master builders' associations: Birmingham, 722; Leicester, 163; National, 211, 235; Preston, 561; York, 245
Master slaters' association, 382
Mausoleum, Seaton Delaval, 561
Maximum height of corner buildings, 725
Mayfair, buildings in, 805
Measurers, Glasgow institute of, 511
Measuring: fees for, 548; stone cornice, 164; walls, 827
Mechanical: engineering terms, dictionary of, 734; engineers, institution of, 197
Medal: institute royal gold, 3; new A.A., 514
Medieval building trade guilds, 514
Membership, colonial, surveyors' institution, 836
Members, ordinary, and artistic fellows, 863
Memorials: as to rights of light, 759; Durham (cathl., Lightfoot) 619; Edinburgh (St. Giles', Inglis) 515; Hammerfest (wooden) 839; Oxford (Univ. Coll., Shelley) 619
Mersey aqueduct tunnel, 203
Metallic tubing, flexible, 203
Metropolis, yearly growth of the, 165
Metropolitan improvements, proposed, 874
Midsummer Norton, sewerage and water supply, 165, 198
Millbank prison, concrete at, 900
Mills, C. F., in re, 514
Mineral owners, rights of, 828
Ministries, 938
Mission: chapel (Black Heath, Womersley) 459; room (Bir. Paul) 232
Model windmill, is it a sky sign? 94, 654, 793
Modern architecture, some mysteries of, 728
Mongolian brickmaking, 665
Mont St. Michel, the crypt, 421
Monuments: Oulton, Staffs, 580; St. Paul's (Wellington) 488, 620
Moors, Jos., Birmingham, the late, 404
Mortar: 243; bad, 619, 863; pink, of Catania, 168
Mortgages v. surveyor, Dannes v. Gould, 269, 654
Mortgage of building agreement, 832
Mortgages, surveyors and, 687
Moses, Chris., in re, 69
Mottistoun manor house, 617
Moving houses, is it economical, 756
Muirhead competition, 911
Municipal: buildings (Battersea) 655 (Bath) 306, 476 (Bristol) 338 (Glasgow, dry rot at) 409 (Morley) 546 (Oswestry) 196 (Oxford) 31, 40, 69, 141 (St. Pancras) 629; engineers' association, 102, 193, 409; lodging house, Drury-lane, 336
Museums: Ghizeh, 829; Highgate (sanitary) 795, 834, 900; Oxford (Univ.) 618; Soane (curatorship) 664, 825; White-chapel, 595
Music halls: and theatres, select committee's report on, 245, 278; Bristol (Empire) 722
Mysteries, some, of modern architecture, 728
Mytholmroyd sewage scheme, 825

NAMES, architects', on buildings, 760
National: art training school, 69; assocn. master builders, 211, 235; competition (drawings) 478 (schools of art) 131; gallery, 95; plumbers' congress, Dundee, 406
Navigable rivers in France, 655
Neglected chapter of architectural history, 452
Negligence: contributory, 513; in house drainage, alleged, 305
Nelson, Lanos, new reservoir, 479
New: closet seat, 523; Lancashire watering place, 165; lights in boundary walls, 686, 724; street schemes, Holborn to Strand, 34, 95, 105, 165, 199; works department, L.C.C., 733, 761; York (aqueduct, action for extras) 806 (architectural league) 938 (highways) 130 (Opera house, burning of) 445 (theatre regulations) 615; Zealand, co-operative contracts in, 614

Newbattle abbey, excavation at, 897
Newcastle, Rutherford college, 511
Newen v. Steer, ancient light, 233
Newman, G. and Co., in re, 793
Nonconformist church building, popular handbook of, 738
Non-liability of architects for clients' orders, 649
Non-party walls, 374
Nooks and corners of Herefordshire, 660
Northallerton sewage works, 823
Northampton sewage farm, 549
North: Cornwall railway, 230, 617;
Germany, holidays in, 210
Norfolk, water supply, 580
Notes: from Edinburgh, 57, 520; from Paris, 509, 589; on application of architectural education, 655; on construction of cranes and lifting machinery, 90; on factory and workshop act, 172; parliamentary, 32; way-side, 28, 40, 83, 124, 160, 194, 230, 261, 312, 334, 370, 404, 440, 474, 508, 544, 580, 611, 643, 651, 720, 754, 788, 824, 858, 891, 930
Notice, pay in lieu of, 823
Nottingham, exhibitions: art, 445; health, 626; traders' memorial as to rights of light, 759
Nuisance, is a urinal necessarily a, 164, 479, 862

OBITUARY: Austin, H. G., Canterbury, 162; Barclay, Hugh, 788; Bickelsteth, Dean, 545; Bisset, J. H., 788; Bleibtreu, G., 559; Buco, R., Dundee, 182; Cheake, W., Hereford, 174, 234; Cleaver, W., 721; Dismock, J., 476; Fowler, J., Louth, 545; France, H., Junr., 721; Fryer, A., 894; Gallani, P., 824; Gibson, J., F.S.A., 930; Gilchrist, T., 476; Gonon, E., 404; Graves, E., 664; Gray, R., 628; Greenslade, J., 930; Greenwood, J., Southampton, 350; Grover, J. W., 334; Haggard, J., 894; Helliwell, W., 174; Hendrick, E., 510; Holly, H. E., New York, 476; Jackson, J. E., Carlisle, 28; Joly, M., 476; Joseph, Felix, 303; Kelly, R., Moxborough, 869; Kirkwood, W., Edinburgh, 214; Lefau, E., Boston, Mass., 558; Macdonald, E., Aberdeen, 545; Marten, H. J., 684; Peel, P., 628; Roden, W. T., 930; R. de, E., 350; Shaw, J., West Derby, 28; Simpson, W., Althly, 734; Sinclair, W., Lerwick, 510; Skene, W. F., 334; Smith, A., Farnham, 858; Sugden, W., Leek, 476; Thomas, W. E., Montreal, 174; Thompson, W., 545; Trowbridge, Gen. W. F., 350; Turner, J., Goldcott, 721; Venable, R. R., 721; Von Siemens, W., 824; Waterston, Jas., 628; Wild, J. W., 664; Wilkins, R., Bristol, 244; Will, A., Dundee, 39; Woolner, T., R.A., 545; Wootton, B. H., 174; Wright, Lyons, 894; Wyatt, Matt, 476

Obstructional, lateral, of light, 615
Offices: clerks of works, and the building act, 338; county council (Stafford) 162 (Wakefield) 723; local board (club designs) 908 (Orrompton) 880 (Hoylake) 40 (Ilford) 665, 893, 937 (Barnmarsh) 826 (Shepton Mallet) 629; printing (Leeds) 91 (Sheffield) 422; Public Record (extension) 768
Oil-colour painters' institute, 622
Older forms of terracotta roofing tiles, 210
Oldham: insanitary dwellings in, 514; sewerage works, 620
"Open and unbuilt upon," 164, 479, 862
Openings for the art workman, 587, 635
Opera House, New York, burning of, 445
Ordinary: flow of a river, 62; members and artistic fellows, 583
Orientation of churches, 881
Ornamental draughtsman and designer, 650
Ornament, principles of, 349, 543
Osborne house, additions to, 266, 385
Our streets and footways, 89
Outgoings, leases and, 721
Overhanging cornices, 653
Owen Jones prizes, 623
Own v. building, of a club, 759
Ownership and return of drawings, 342
Owners: land, in London, 829; mineral, rights of, 828; under the building act, 937
Oxford: cathedral, pre-Norman work at, 350; municipal buildings, 31, 40, 69, 141; University museum, 616
Oxonienis, archaeological, 8

PADDINGTON. St. Mary's hospital competition, 546, 551
Painters: get standard wages, 687; in oil colours' institute, 622; in water colours' socy., 763
Paintings: ancient, at Caterbury, 685; decorative, at the Academy, 105
Painting: tar-smoke, 900; water colour, in England, 5
Palace: Battersea, Albert, 620, 765; Linlithgow, 302
Palestine: future of, 104; railway, 92
Paris: architectural papers of, 126; notes from, 509, 788
Park, Kirkcaldy, 511
Parliamentary: candidates, 34, 59; notes, 32
Parker, W. R., Cardiff, in re, 793, 900
Parquetry, Steinitz's, 306
Parsons, Henry: and his deputy, 862; charge against, 404, 409, 450, 724
Person who was his own architect, trouble of, 766
Party walls, non, 374
Pattern making, principles of, 838
Pavilions: Edinburgh (cricket) 476; Edcliffe, Sheffield (refreshment) 9; Reading (park) 701

Paving: Jarrah wood block, 499; vitrified brick, 884
Pay in lieu of notice, 828
Payment for the tool-riding hour, 653
Peel, Paul, the late, 638
Penalty of departing from specification, 444
Perspective: linear, 8; shadows in, 170, 371, 523, 909
PERTH builders' annual outing, 190
Petroleum, poems in, 833
Petrus tiles, 628
Philadelphia, a cutting competition in, 193
Photographic survey of Warwickshire, 900
Photographs: architectural, from Somersetshire, 441; in Pall Mall, 452
Physical laboratories, desiderata in, 203
Pier, Raker, Sunderland, 372
Pike v. Byers, 889
Piles in soft soil, safe load for, 794
Pink mortar of Catania, 166
Pipes: lead destroyed by electric action, 445; specification for, 766, 895; stone-ware v. iron, 210, 792; water, 696, 724
Pitfalls of practice, 167
Pitwood, F. T., 758
Plans: alternative, architects' charges for, 759; British library, for Chicago exhibition, 443
Plastering, bid, 479
Plating, hard silver, 838
Plinths and skirtings, 7
Plumbers: company, 884 (and the Berridge bequest) 550; lectures to, 129; registration, 129, 559, 585, 621, 655, 639, 844, 933 (and examinations) 733 (congress, Dundee) 306, 406
Plumbing: and drainage specification, 592, 766, 826, 881, 895, 898, 936; sanitary, lectures on, 650
Pocket manual for art students, 130
Poems in petroleum, 833
Police: court (Windsor) 9; stations (Guildford) 442 (Sheffield) 826 (York) 582
Polish and varnish maker, practical, 634
Pollution, river, at Bury, Lancs, 534
Polytechnics: Borough-road, S.E., 430; Clerkenwell, 477
Pompeii, an Algerian, 59
Popular free library, 32, 625
Popular handbook of Nonconformist church building, 733
Portsmouth, sanitary congress at, 370, 435, 415
Position of timber, 373, 438, 478, 518, 533, 652, 757, 827
Post offices: Glasgow, 338; Southampton, 723
Poyers, Brothers' atelier, Louvain, 409
Practical: electrical light fitting, 838; polish and varnish maker, 664
Practice, pitfalls of, 167
Practices, unprofessional, 868
Prague, the Powder tower, 614, 665
Precipitant, best sewage, 199
Premises, the alteration of, 378
Presentation to the Lord Mayor, 900
Preston master builders' assocn, 551
Pretty, putting it, 473
Pries, D., Nantymel, in re, 937
Prices, 6, 64, 135, 171, 265, 3, 3, 343, 405, 414, 486, 522, 628, 721, 732, 836, 930
Princely premium at Killarney, 755
Principles of: architectural design, first, 832; ornament, 349; pattern making, 838
Priory, Priorchopps, St. Mary's, 875
Private: Bills for 1893, 794; contract, commission for sale by, 584; road and street making, 244; street works act, 543, 584, 618
Privy system at Bradford, 306
Prize work at the Academy, 833
Problems: of town development, some, 798; unsolved, 797
Production and use of electric light, 733
Professional: exclusiveness, 61; tax on architects, 635
Profession: art, and sciences of architecture, 494; or art, architecture a, 551, 582
Programmes, architectural examination, 8
Promenades: Dover, 756; Kingston-on-Thames, 211
Property: house, handbook of, 731; in building materials, 233; real, limitation act, 198
Prospects: architects', in Australia, 375, 655; of engineering science, 203
Protection of ancient buildings, socy. for, 31
Public: baths and washhouses, 280, 475, 730; buildings, United States, 235; health for London 233; libraries (Ayr) 439 (Buckingham Palace-road) 701 (Gorton, Manchester) 211 (Lewisham) 351 (Poplar) 32, 525 (Stoke Newington) 141 (White-chapel) 595 (Widnes) 546; record office extension, 768; works, loans for, 806
Pumps and pumping, 90
Pupils: architects and, 447; architects', in Scotland, 235
Purification of Lancashire rivers, 409
Putting it pretty, 478

QUADRANGLE and block, the, 93
Quantities, should architects take out their own, 537
Quantity surveyors' table and diary, 838
Quarry, dispute as to, quitting, 164
Quenslan, conditions of contract in, 166
Quitting a quarry, dispute as to, 164
RAEBURN and Scottish portraitur., 585
Raffaello, duplicate cartoons by, 375
Railway charges and expenses, 125; cottages and the building act, 33; loco motive works, Stretford, 487; stations (and the building act) 85 (Derby) 183; widening, near Bickley, 580

Railways: Barnton, 337; Barghead and Hopeman, 337; Cornwall, 617; Dee and Bidston, 934; Dore and Caimley, 617; electric, in London, 934; Indian, 336; Inverness and Aviemore, 92, 372, 560; Kettering and Rugby, 544; Manchester, Newcastle and Glasgow, 544; Manchester Sheffield and Lincolnshire, 33; Marton and Lamington, 477; Metropolitan extension, Chalfont-road to Aylesbury, 337, 372; North Cornwall, 233; Palestine, 92; St. Helens and Louth, 353; the world's, 375; Tottenham and Forest Gate, 442; West Highland, 407; Wreath, 544
Rainfall, its storage and discharge, 3
Real property, limitation act, 198
Rebuilding, 864
Rebuilding or repair, 831
Reclips for staining wood, 59
Record office, public, extension, 763
Reference library, an architect's, 341
Refuse: contractors' a nuisance, 121; destructors, electric lighting and, 208; disposal, 663
Registration: architects' (bill) 31 (in Victoria) 550, 620; plumbers', 129, 550, 585, 620, 655, 689, 844, 933 (and examination) 733 (congress, Dundee) 306
"Rendu" of architectural drawings, 379, 649, 872
Repair or rebuilding, 831
Repairs: and fixtures, arbitration as to, 725; churchwarden's responsibility for, 33, 127
Re-paving of London streets, 445
Reports: graphic methods, Brit. Assocn., 204; theatres and music-halls, select committee 245, 273
Restaurant, Frascati, 760
Restrictive covenants, 263
Retaining walls, masonry, 23
Revisionary interests in rights to light, 725
Reviews: Advanced Building Construction, 649; Almanacs and Diaries for 1893, 874; Architectural Association Brown Book, 488, 547; Archaeologia Oxoniensis, 8; Architectural Antiquities of Isle of Wight, 555; Architecture, a Profession or an Art, 554; Arithmetic for Schools, 350; BUILDING NEWS Club designs, 205, 450, 908; Carpenter and Joiner, 838; Castellated and Domestic Architecture of Scotland, 206; Charing-Cross to St. Paul's, 650; Coventry Portfolio, 839; Decorator's Assistant, 350; Dictionary of Architecture, T-Z, 104; Diquic Blotting Case, 838; Electric Light, its Production and Use, 733; Electric Light Popularly Explained, 350; Engineering Magazine, 538; Fifty Years of the Water Cure, 664; Future of Palestine, 104; Garden Design and Architects' Gardens, 282; Gentleman's Magazine Library, 350; Gothic Architecture, 873; Grammar of Woodwork, 650; Handbook of House Property, 733; Holidays in North Germany and Scandinavia, 210; Illustrated Catalogues, Art Galleries (Birmingham) 838 (Glasgow) 838; Illustrated Europe, 210; Illustrated History of Furniture, 174; Indian Cuts, 350; Inns of Court and Chancery, 633; Iron and Steel Maker, 650; Labour Contracts, 653; Lectures on Sanitary Plumbing, 650; Lightning Conductors and Lightning Guards, 650; Linear Perspective, 8; Lockwood's Dictionary of Mechanical Engineering Terms, 734; Manual of Continuation Schools and Technical Instruction, 650; Nooks and Corners of Herefordshire, 660; Notes on Construction of Cranes and Lifting Machinery, 90; Older Form of Terracotta Roofing Tiles, the, 210; Ornamental Draughtsman and Designer, 650; Pocket Manual for Art Students, 130; Poems of Petroleum, 838; Popular Handbook of Nonconformist Church Building, 733; Practical Electric Light Fitting, 833; Practical Polish and Varnish Maker, 664; Pre-Norman Window at Oxford Cathedral, 350; Principles of Ornament, 349; Principles of Pattern Making, 838; Pumps and Pumping, 90; Quantity Surveyors' Tables and Diary, 838; Sanitary Crusade through the East and Australasia, 623; Scientific and Technical Papers of Werner von Siemens, 210; Story of Leicester-square, 650; Transactions of American Society of Civil Engineers, 210, 350; Transactions of Society of Engineers, 104; Treatise on Thermo-Dynamics, 731; Water Colour Painting in England, 5; Woodwork, 731
Richmond, Surrey, water supply, 214
Right of access to shore, 123
Rights: of mineral owners, 828; of way, 804; to light (memorial as to) 759 (reversionary interests in) 725
Ripon, drainage of, 759
Risks, contractors', 126, 128
Rival builders, 725
River: bath, tidal, 548, 618, 652; ordinary flow of a, 62; pollution at Bury, Lancs., 534
Rivers: Lancashire, purification of, 409; navigable French, 655; windings of, 202
Road: and footway blocks, 555; and street, making, private, 244; maintenance, arbitration, 793
Robertson, W. F., in re, 725
Roberts, W., in re, 584
Robinson, J. L., R.E.A., 140
Rochester: cathedral restoration, 232, 617; Eastgate, 525
Rogers, J. G., Portsmouth, in re, 935, 793
Rome, electrical transmission in, 864

Roman remains: at Swaffham Prior, 858; at Wallend, 105; in Cumberland, 510
Roof: coverings, roofs and, 201; steel, 416
Roofing tiles, older forms of, 210
Roofs: and roof coverings, 201; iron, art in, 481
Rot, dry: 652; cheap cure for, 409
Royal Academy (prize work at) 833 (proposed migration to the Haymarket) 166 (sculpture) 455; archaeological institute, 211; gold medal, R.E.A., 3; institute, British architects, 3, 652, 789, 869 (examinations) 32; institute, oil colour painters, 622; Scottish academy, 936; society (British artists) 55, 622 (water colour painters) 763
Rural building bylaws, 410
Ryde, Edward, the late, 350

SAFE load for piles in soft soil, 794
Saint: Andrew (Avenmouth) 722 (Northborough) 124 (Pagnott) 547; Ann (Manchester) 759; Aubyn (Jersey) 551; Augustine (Tonge Moor) 175; Barnabas (Dulwich) 231, 665 (Linthorpe) 755; Bridgid (Kildare Cathedral) 267; Clement (Bradford) 511; George (Aldershot) 30 (Camberley) 511 (Newcastle-under-Lyme) 547; Giles (Edinburgh, Inglis meml.) 515; Gilles (near Oaen) 769; Gregory v. St. Paul, R.O., 769; Hilda (Hartlepool) 646; Hugh (Lincoln, R.O.) 755; James (Salt) 581; John Baptist (Kidderminster) 616; John Divins (New York) 933; John Evangelist (Crawshawbooth) 648; John's, Newfoundland (cathedral burnt) 95; Louis waterworks, 375; Matthew (Barnardstoun, Newport) 476; Mary (Browedge, R.C.) 267 (Elmfield Castle) 735 (Leigh Woods, Bristol) 616 (Oxford) 859 (Paddington hospital) 546, 551 (Priestchurch, priory) 875 (Shrewsbury) 91 (Wiggenhall) 306; Mary Magdalen (Old Fish-street, E.C.) 769; Matthew (Brixton) 235; Michael (Bedford park, Chiswick) 385 (Kingstown, R.C.) 231; Oswald (Small Heath) 442; Paucers (municipal building) 629; Paul (Addlestone) 805 (Baldminster) 791 (East Barry) 791 (Edinburgh) 616; Peter and Paul (St. Crosby, R.C.) 30; Peter (Bexhill) 685 (Plymouth) 825 (Roath) 315 (Wolverhampton, institute) 124; Philip (Stepney) 617, 789, 805, 876; Saviour (Liverpool) 30 (Southwark, free library) 510, 517 (do. baths) 617, 621 (Weston-super-Mare) 675; Sepulchre (Holborn Viaduct) 162; Stephen (Vienna) 655; Swyth (Hither-green, S.E.) 91
Sales at the London Mart, 130
Sale, sewage works at, 653, 726
Salford: arbitration at, 233; sewage purification at, 59
Sand: floor, 125
Slant: blast cleansing walls, 166; earth and grass roofing, 140
Sanitary: appliances (domestic) 347 (nursery, Highgate) 795, 834, 900; building construction, 784; construction of our towns, 307; congress at Portsmouth, 307, 405, 415; crusade through the East and Australasia, 310, 346, 380, 623; inspectors (assocn.) 722 (examination) 95 (lectures to) 480; plumbing, lectures on, 655; specialties, 209; ventilation, 872
Sargeant W., in re, 899
Sash-fastener, Rogers's, 8
Schools: Birmingham, 267; British, at Athens, 88; City of London (Ward's) 763; continuation, manual of, 650; Edinburgh, 302; Gateshead (Elison) 685; Hong Kong (girls) 735; Hove, (R.C.) 629; J. hn-street, W.C. (Sunday) 105; National art training, 69; Preston (deaf and dumb) 511; Reading (science) 476; Templest, E.C. (Ward's, girls) 336; Walthamstow (industrial) 880. [See also under Board, Grammar, and Technical Schools.]
Schools of art: Birmingham municipal, 375 (and the archi. assocn.) 335; Carmarthen, 476; national competition, 131; Westminster, 338
Science, art and profession of architecture, 484
Scotland: and Ireland, tunnel between, 129; architects' pupils in, 235; castellated and domesticated architecture of, 206
Scottish Academy, royal, 936
Seaside: architects, 724, 791; bath-house, club designs, 205; dwellings, 443
Seasoning wood, kiln for, 95
Seat, new closet, 523
Select committee's report on theatres and music-halls, 245, 273
Self-acting sash fastener, 8
Serkirk, subterranean passage near, 270
Sevenoaks, sewerage of, 828
Sewer tunnel: 757; difficulties, 140
Sewage: disposal, 197 (at Hanwell, cross-actions as to) 94; farm arbitration at Walton, Liverpool, 231; precipitant, best, 199
Sewer: relief, at Brooklyn, 282; what is a, 33
Sewers: cleansing and ventilation of, 509; size of, 58
Shadows in perspective, 170, 371, 523, 909
Shakespeare, architecture of, 314
Sheffield: night soil disposal, 75; society architects and surveyors, 661, 855
Shooting: box, club designs, 450; lodge, Alnabree, 198
Short or full specifications, 657
Should architects take out their own quantities? 537
Shutters, sliding v. lifting, 543

Siam, teak trade in, 410
Sicily and Greece, temples in, 764
Siemens, W. von : 210; the late, 210, 824
Sign, sky: is a model windmill s, 94, 654, 793; what is a, 758
Silver plating, hard, 838
Smiths, Roman theatre at, 339
Sites for theatres, suitability of, 373
1834, architectural tour in, 67, 137
Size o sewers, 68
Skirting and pilinths, 7
Sky sign: is a model windmill s, 94, 654, 793; what is a, 758
Slaters, master, association, 382
Sliding v. lifting shutters, 543
Slopes, chaining on, 101
Slumbering instinct, a, 651
Smithfield markets, electric lighting in, 664
Soane museum curatorship, 664, 825
Societies: archaeological (Kent) 105; architects, 511, 588, 694, 764, 832 (excursion to France) 28, 283 (do. Manchester) 511, 525, 588; architects and surveyors (Sheffield) 661, 686; architectural (Leeds and Yorkshire) 734, 825, 897 (Liverpool) 490, 511, 734; arts, 726; British artists, exhibitions, 35, 622; building, the law of, 408; civil engineers, American, 210, 350; engineering (Liverpool) 31; engineers, 103, 104, 487, 684, 837; protection of ancient buildings, 81; water colour painters, 763
Soft soil, safe load for piles in, 794
Soil pipes as lightning conductors, 203
Soil pipes as safe load for piles in, 794; stability of walls on, 36, 134, 242, 277, 344, 419, 518, 623, 801, 903
Some: first principles of architectural design, 832; mysteries of modern architecture, 728; problems of town development, 798; temples in Greece and Sicily, 764
Somersetshire excursion, archi. assocn., 163, 204, 235, 279; photographs of, 411
Sound, deadening, 861
Southwark: baths competition, 617, 621; public library competition, 610, 517
Span, large, arches of, 231, 413, 493, 558, 697, 902
Specialists, architect, 763
Specialities, sanitary, 203
Specification: drainage and plumbing, 592, 786, 826, 861, 895, 898, 936; penalty of departing from, 444
Specifications: full or short, 657; working drawings and, 412
Stability of walls on sills, 36, 134, 242, 277, 344, 419, 518, 623, 801, 903
Stage, timber, is it a building, 338, 444
Stained glass, 445, 580, 796, 828
Staining wood, recipes for, 69
Stations: fire (Grays) 489; police (Guildford) 442 (York) 582; railway (and the building act) 95 (Derby, Midland) 163
Statues: Berlin (Great Elector) 489; Chicago (Burns) 755; Durham (W. Crawford) 445; Exeter (Drake model) 479; Lichfield cathedral, 410
Steam: or hot water for greenhouse heating, 349; power, carvers' right to charge for, 862

Steel: in construction, 303; roof, 416
Steeple and towers, 910
"Stickit" architect, the, 72
Stone: arches of large span, 231; bedding iron on, 478; cornice, measuring, 164; Hopton Wood, 478; macadamised, export of from Cherbourg, 69; suggestive domestic work in, 175
Stones, holding power of bolts in, 129
Stoneware v. iron pipes, 210, 792
Stonework, renovating, 408, 478
Storage and discharge of rainfall, 3
Storm in a teacup at the A.A., 160
Strains in girders, 936
Strand to Holborn, new street schemes, 34, 95, 103, 165, 199
Stratford, G.E.R. works, 437
Street: making, private, 244; new, from Holborn to Strand, 34, 95, 103, 165, 199; paving experiment in Glasgow, 864; private works act, 648, 684, 618
Streets: and footways, our, 89; existing, and the building act, 687; gardens as encroachments on, 649; London, re-paving of, 445
Stresses in cranes, 373
Structures, latent weaknesses of, 275
Stucco front, 686
Student surveyors, books for, 478
Students, art, pocket manual for, 130
Subcontractor and contractor, 126
Subway, Alapham Junction and Paddington, 854
Sugden, W., of Leek, the late, 475
Suggestive domestic work in stone, 175
Suitability of sites for theatres, 373
Sulphate of alumina as sewage precipitant, 199
Summer house, club design, 351
Sundial, Holyrood palace, 665
Surveying: land and levelling, 4, 32, 92, 101, 137, 278, 304, 443, 512, 547, 683, 651
Surveyor: action by mortgagee against, 654; extraordinary charge against, 619, 653
Surveyors: action for libel, 687; and mortgages, 687; Australasian, conferences of, 584; charges, 768; student, books for, 478
Surveyors' institution: 700, 853; colonial membership of, 838; examinations, 95
Survivals, architectural, 657
Swash v. Remy (fees) 725, 900
Swedish wooden houses, 478
Swimming baths, 730
Swindler of timekeepers, 69, 127, 444
Sydney: arts and crafts exhibition, 795; hospital scandal, 270
TAKING out their own quantities, architects, 537
Tall chimneys in America, 375
Tare, indicator, new, 760
Tarsmoke painting, 900
Taunton excursion, Archi. assocn., 163, 204, 239, 279
Taxation: of arbitrators' fees, 269; of building land, 204
Teacup, storm in a (an A.A.) 160
Teak trade in Siam, 410
Technical schools: Aberdare, 723; Ac-cington, 385; Aston, 859; Batley, 57, 859; Birmingham, 825; Douglas, I.M.,

40; Maidstone, 595, 629; Manchester, 351, 377, 421, 455, 489; Port Talbot, 701; Radcliffe, 837; Salford, 511; Widnes, 546
Temples: hypæthral, 869; in Greece and Sicily, 764
Tennis courts, 618
Terracotta tiles, older forms of, 210
Testing drains, 478, 512, 548, 583
Theatre: lessee and clergyman, action between, 828; regulations in New York, 195
Theatres: 63, 138, 168, 238, 232, 237, 308, 332, 418, 419, 477, 555, 590, 695, 765, 802, 932; and music hall, select committee's report on, 245, 273; Brussels, 864; construction and interior arrangement of, 65; Smithth, Chementon (Roman) 339; suitability of sites for, 373
Thermo-dynamics, treatise on, 731
Thirty thousand volumes, 9
Tidal river bath, 548, 618, 652
Tiles: older forms of roofing, 210; petrous, 623
Timber: and its position, 373, 408, 478, 548, 553, 652, 757, 827; stage, is it a building, 333, 444
Timekeepers: a swindler of, 69, 127, 444
Tired toils, 130
Tom, J., Gould's, 900
Tour in 1634, architectural, 67, 137
Tourists architectural, 237
Tower: Blackpool, 230, 872; of London, the, 31; Wembley, 302
Towers and steeples, 910
Town: air, impurities in, 203; development, problems of, 798
Town halls: Battersea, 685; Bexhill, 665, 835; Killarney, 755; Llanelly, 315, 477, 545, 547; Morley, 648; Newcastle-on-Tyne, 629; Walsall, 105, 196, 211, 385, 723, 860, 867
Towns, our, sanitary condition of, 307
Tramways: cable (Matlock) 660 (Strat-ham) 860; compressed air for, 655; London arbitration, 165, 233, 863
Tribunal of arbitration, 899
Troubles of a parson, 756
Tubing, flexible metal, 203
Tunnels: Ireland and Scotland, 129; Mer-sey aqueduct, 238; Severn, 140, 757
UNBUILT upon and open, 164, 479, 862
Underground waters, circulation of, 203
Unidirectional bankrupt, action by, 653
Unfenced machinery, 793
United: service institution, 655; States, designing of public buildings in, 235
University: Aberdeen, 648; college, London (architecture) 69 (Egyptology) at 794
Unprofessional practice, 838
Unsolved problems, 797
Urinal, is it necessarily a nuisance, 164, 479, 862
VALUER'S license, 827
Ventilating: appliances, Shorland's, 486; sash fastener, 8
Ventilation: 834, 893, 936; and cleansing of sewers, 509; sanitary, 872

Vicarious design, 831, 897
Volumes, thirty thousand, 9
Vyrnwy water supply, 94, 101, 860
WAINSCOTING, 161, 695
Wall, boundary, new lights in, 686, 734
Walls: damp, 792; insufficient thickness of, 513; masonry retaining, 29; measuring, 827; non-party, 374; on soils, stability of, 36, 134, 242, 277, 344, 419, 518, 623, 801, 903
Walsall: baths, 546, 583, 617, 651, 755, 867 town hall, 105, 196, 211, 385, 723, 860, 897; year's progress in, 795
Warehouse, what is a, 513, 653, 692
Warwickshire, photographic survey of, 900
Washable distemper, 827
Washhouses and baths, public, 230, 475, 730
Water: closets (Chamisso) 874 (Merrill's) 910; colour (painters society) 763 (painting in England) 5; cure fifty years for the, 681; filtering, 29, 37; hot water, cylinders and tanks for, 908; pipes, 683, 724 (destroyed by electric action) 445
Way: covered, 763; rights of, 804
Wayside notes: 28, 40, 88, 124, 160, 194, 230, 264, 302, 334, 370, 404, 440, 474, 508, 544, 560, 614, 648, 634, 720, 764, 783, 824, 858, 894, 930
Weight: breaking, 758, 792, 827; of crowds, 838
West Hartlepool, progress of, 123, 723
Westminster abbey, 805, 861, 897
What: is a "building"? 144; a "sewer"? 33; a sky sign? 758; a warehouse under the building act? 513, 653, 692; have we to do with the beauty of London, 692
Which way to steer, 97
Whittingham, C.S., in re, 94
Who calls the tune must pay, 33, 127
Wight, Isle of, antiquities of, 555
Wild, J. W., the late, 661
Williamson, C.H., in re, 165
Windmill, model, is it a sky sign? 194, 654, 793
Window design, 797
Wooden: houses, Swedish, 478; structures, unlicensed, 128
Wood: and iron verandahs, 725; seasoning, kiln for, 95; staining, recipes for, 69; vaulting, Winchester, 520
Woodwork: 734; and furniture, 829; grammar of, 650
Worcester sewage disposal, 933
Work-a-day art, 615
Workhouses: Hastings, 895; Knutsford, 105; Patricroft, 442, 826; Tottenham, 105
Working drawings and specifications, 412
Workman, art, openings for, 687, 685
Workmen, travelling time for, 64
Works: and services, contracts for, 653; deprement, L.C.C., 733, 761
Wrong end, beginning at the, 553
Wyw hygienic stove, 335
XYLOLITH, 306
YEO, pollution of the, 791
Y.M.C.A., Ipswich, 511
York typewriter, 450

INDEX TO ILLUSTRATIONS.

*. * The Lithographic Illustrations will be found immediately following the Pages indicated.

ABBEYS: Dryburgh, 736; Newbattle, N.B. (sundial at) 212; Old Cleve, 241, 246; Westminster (restored north transept) 806
Aberdeen market cross, 212
Academy, royal: decorative paintings at, 108; pictures, 386; sculpture, 10, 456
Adamant, deluge, 558
Additions to Wightwick manor, 736
Addlestone, new channel, St. Paul's ch., 808
Adlert-gate, Hyde-park-court, 736
Alford, house near, 840
Alms-houses: Coventry (Babla's and Bond's hospitals) 840; Marshfield, 176
Altar: Oxford cathedral, new, 690; piece by Crivelli, National Gallery, 246
American drawing-room, an (Free Classic in extremis) 614
Antiquities, architectural, of Isle of Wight, 562
Antwerp cathedral, from Place Verte, 876
Apse interior, Coutances cathedral, 422
Arabian room, Seville-at, W., 316
Arcade details, hotel de ville, Oudenarde, 87
Arch, corbelled, Dunster church, 212
Arches: large span, iron, 413, 493, 559, 693, 802; stone, 231
Architect's: furniture at Nottingham, 456; library at Detroit, 417
Architectural: antiquities of Isle of Wight, 562; association excursion to Somerset-shire, 212, 241, 246, 283, 384, 598; drawings, "redu" in, 379, 649, 878
Architecture of Scotland, castellated and domestic, 206, 207, 212
Arm chairs: French, 607; Italian, 316
Association, architectural, excursion to Somersetshire, 212, 241, 246, 283, 384, 598
Aston public baths, 702
Asylum, lunatic: Oxolodge, Newcastle, 176 (2nd prem. design) 456
Ayr, Carnegie free library, 493
BABLAKE hospital, Coventry, 840
Balfour, A. J., Onslow Ford's bust of, 10
Bangkok, King's palace, 347
Bangor, North Wales training college, 912

Banks: Bradford (Yorkshire Penny) 176; Eastbourne (London and County) 665
Barr, North, sundial at, 212
Bath: house, club designs, 212; room, chimney-piece in, Nottingham, 456
Baths: and washhouses (by R. O. Allsop) 281, 475, 731; Aston, 702; tidal river, 548, 618; Walsall (plan) 65
Bayreuth, palace of Wagner's theatre, 238
Bedford-park, Chiswick, pulpit and stalls, St. Michael's church, 338
Bedroom furniture, sketch competition, 473
Belstead, carved, of Jeanne d'Albert, 193
Beesh Holme, Colwyn Bay, stables at, 598
Belfast, semi-detached houses, 876
Benilton, the Nook, 142
Bennet's premises, Cheapside, 876
Berlin, statue of the Great Elector, 493
Billiard room, Fox Oak, Burnhill, 702
Birkdale, Southport, house at, 386
Birling, Kent, proposed district church, 422
Bishop Lydeard church, 234
Bishopsgate-street Within, premises, 284
Blackheath, Womersley mission chapel, 490
Blackmore farm, Somerset, 234
Blount door spring and cheek, 825
Board schools: Carlisle, 806; Manchester (higher grade) 562
Boathouse, Coombe-park, Whitechurch, 316
Bolton, St. Augustine's church, Tonge Moor, 176
Bond's hospital, Coventry, 840
Bootham, York, houses at, 490
Bordeaux, plan of Grand Theatre, 803
Bower farm, Dingleigh, 284
Box, shooting, club designs, 458
Boyd collection of furniture, 857
Bradford, Sundell, Daisy Hill, 422
Brick: and tile iron frame, 911; summer-house, club design, 352
Brighton, R.C. schools, Hove, 630
British Columbia, Victoria cathedral designs: "Ara," 598; "Duomo," 106
Bromsgrove, Firsden house, 806
Brondebury, Grey training college, 422
Brooklyn, Montauk club house, 625, 630
Buckingham Palace road public library, 702

Buffet, 16th century, 142
BUILDING NEWS designing club: local board offices, 912; rosewood cabinet, 422; seaside bathhouse, 212; shooting box, 456; summerhouse, 852
Buildings: Mayfair, 808
Burnhill, billiard room at Foxhill, 702
Business premises: Bishopsgate-street Within, 284; Bradford (bank) 176; Cambridge-circus, 702; Cheapside, 876; Chester, 692; Eastbourne (bank) 668; Piccadilly (hotel) 246; Strand, 598
Bust of Rt. Hon. A. J. Balfour, 10
Buttas, pigeon house at, 668
CABINETS: Elizabethan, 490; rosewood, 422; 16th century, 316; Sheraton corner, 490
Caen, south porch at St. Gilles, 770
Cae-Hun, N. Wales, 106
Calle Mayor, Fuenterria, 352
Cambridge-circus, Gloucester mansions, 702
Canadian summer cottage, design for, 702
Capitals, Ionic, by Inigo Jones, 630
Carbrook, Sheffield, recreation ground lodge, 10
Cardiff, Lady chapel at St. Peter's, 333
Cardinal Manning, G. Puyvallee's statue, 458
Carlisle, Brook-st. board schools, 876
Carnassery castle, fireplace, 212
Carnegie free library, Ayr, 490
Carpanet and joinery, 7, 8, 161, 693, 699
Carved bedstead of Jeanne d'Albert, 193
Castellated architecture of Scotland, 206, 207, 212
Cast iron: arches of large span, 413, 493, 559, 698, 902; mantelpieces, late Alfred Stevens' designs, 893
Castles: Carnassery, fireplace in, 212; Hurstmonceux, 702; Pollok, gateway, 212
Cathedrals: Antwerp (from the Place Verte) 876; Cordova (tower) 142; Coutances (interior of apse) 422; Oxford (new altar and reredos) 630; Salisbury (spire, from Bishop's-garden) 912; Vic-

toria, British Columbia design ("Ara" 598 ("Duomo") 106; Winchester, 620, 621, 626
Cotton, Norwich, house at, 441
Cemetery memorials, Humberfest, 810
Centennial hall, Sydney, 881
Centre table, York council chamber, 386
Chaining on slopes, 101
Chain, traversing with the, 4, 5
Chairs: arm (French) 607 (Italian) 316; Chippendale, 490; French Renaissance, 316; shield back, 490; two Italian, 142; York council chamber, 389, 403
Champion combination water closet, 874
Chapels: Blackheath, Womersley (mission) 490; Clifton coll. (mosaic in) 806; Durham (Uni. coll.) 876; Invergowie, N.B. (All Souls) 562; Mont St Michel (crypt) 422; Roath, Cardiff (Lady, at St. Peter's) 333
Chapter house, Old Cleve abbey, 246
Chatelet theatre plan, Paris, 838
Cheapside, Bennet's premises, 876
Check, door spring, Blount, 825
Cheetham, Manchester, higher grade school, 562
Chest: dressing, 456; hall, 70
Chester, premises in Eastgate-street, 562
Children of the Wolf, by G. Frampton, 458
Chimney-pieces: East Nottinghamstead, 596; in architect's house, Quenington, 456
Chippendale chair, 490
Chiswick, pulpit at St. Michael's, Bedford-park, 386
Christ in the Midst of the Doctors, 806
Churches: Addlestone (St. Paul's), 806; Bedford-park, Chiswick (St. Michael, pulpit and stalls) 386; Birling, Kent (district) 422; Bishop Lydeard, 284; City (St. Mary Magdalen, Old Fish-st.) 770; Dilwich (St. Barnabas) 666 (West, extension) 352; Dunster, 212 (rood screen) 536; Eimley Castle, 736; Fenwick, N.B. (pulpit and sounding board) 212; Ham Hill, Kent (Christ) 169; Kilbirnie (Garnock family gallery) 212; Largs (Montgomery monument) 212;

Leominster, Sussex, 702; Minehead (St. Michael) 246, 238; New Sh-reham, 451; Nicholaston (interior east end) 702; Paisley (Coats' meal) 106; Penarth (All SS.) 10; Princethorpe Priory, Rugby (stalls) 876; Roath, Cardiff (St. Peter) 833; Ruiston, 211; St. Decuman's, Somerset, 241; St. Giles, Caen (s. porch) 770; Saragossa (leaning tower) 840; Seville (tower) 142; St. Peter (St. Philip) 770, 806, 840, 876, 912; Taunton (St. Mary) 840; Tonce Moor, Bolton (St. Augustine) 178; West Dulwich (extension) 352; Weston-super-Mare (St. Saviour) 876; Wribbenhall (lych-gate) 806

City, the: premises (Bishopsgate-street Within) 284 (Cheapside, Bennett's) 876; St. Mary Magdalen church, O. d. Fish-st., 770

Clacton-on-Sea, Grand hotel, 352
Cleeve abbey, 241, 246
Clifton college chapel, mosaic in, 836
Closets, water: Champion combination, 874; flush tank and trough, 910

Club, BUILDING NEWS designing: cabinet, 422; local board offices, 912; seaside bath-house, 212; shooting-box, 456; summerhouse, 352

Clubhouse: Montauk, Brooklyn, N.Y., 625, 630; Great Marlow, 630; Union, Holborn, 456

Coalbrookdale mantelpieces, 893
Coats memorial church, Paisley, 106
Coffee, a modern, 70

Colleges: Bangor (training) 912; Broun-bury (training) 422; Clifton (chapel, mosaic in) 806; Durham University (chapel) 876; Newcastle-on-Tyne (science) 212

Columns to organ, Italian, wooden, 736

Colwyn Bay, stables at Beach Hotel, 693

Combination water closet, Champion, 874

Competitions: baths (Walsall, selected plan, H. T. Bonner) 651; "B. N." designing club (cabinet) 422 (local board offices) 912 (seaside bathhouse) 212 (shooting-box) 456 (summerhouse) 352; board school (Manchester higher grade, selected, Boyle and Bennett) 562; cathedral (Victoria, B.C., "Ars") 596 (do., "Duomo") 106; chapel (Laidy, Roath, Cardiff, selected) 333; libraries, public (Ayr, selected, C. Douglas and Morrison) 490 (Poplar, selected, J. and S. F. Clarkson) 528 (St. George, Hanover-square, selected, A. J. Bolton) 702; lunatic asylum (Coxlodge, Newcastle, selected design, J. W. Dyson) 176 (do. 2nd, Montgomery and Carr) 456; municipal buildings (Oxford, selected, H. T. Hare) 40, 70 (C. Bell) 40, 106 (J. B. Hinks) 40 (Perkin and Cheston) 40, 70 142 (E. Runtz) 70; technical school (Manchester, selected, Spalding and Cross) 422, 490 (2nd, Gibson and Russell) 456 (3rd, Runtz and Farrow) 456 (4th, T. Sington) 490 (Port Talbot, W. L. Griffiths) 702; town hall (Llanelli, 1st, Simon and Tweedie) 526 (2nd, selected, W. Griffiths) 526; training college (Bangor, selected, R. Grierson) 912

Constructional drawings: roof in steel, 416, 422; timber footbridge, 106

Convalescent home, Perranporth, 316

Corbett's destructor furnace, 663

Cordova, the Court of Oranges, 142

Cornice, stone, 92, 164

Cornwall, convalescent home for, 316

Cornwall, convalescent home for, 316

Cottages: homes in Surrey, proposed, 281; hospitals (Galashiels) 935 (Willeddon) 598

Cottages: Canadian summer, design for, 702; Longford, Kent, 770; Prestonbrook, Warrington, 934

Couch, Hepplewhite, 490

Council chamber fittings, York, 352, 369, 386, 403

Court: of Oranges, Cordova, 142; police, Wandswoth, 10

Courtyard at Palma, Mallorca, 336

Coutances cathedral, interior of apse, 422

Coverly, Bablake and Bond's hospitals, 840

Coverly's hospital, Stirling, 212

Coxlodge asylum, Newcastle-on-Tyne, 176 (2nd prem. design) 453

Crivelli, altarpiece by, National Gallery, 246

Crosses, Aberdeen market, 212

Crusade, a sanitary, 310, 311, 347, 351

Crypt: de l'Aquilon, Mont St. Michel, 422

Cylinders and tanks for hot water works, 907

Daisy Hill, Bradford, house at, 422

Decorative interior, by W. Hensman, 562

Decorative paintings at Academy and New Gallery, 106

Deluge Adamant, Telford's, 553

Designing club: local board offices, 912; rosewood cabinet, 422; seaside bath house, 212; shooting-box, 456; summerhouse, 352

Designs: "B. N." club, 352, 422, 453, 912; cottage, a Canadian (R. Wilby), 702; cottage homes, 281; drawing-room, an American, 614; interior decoration (W. Hensman), 562; Japanese stencil, 840; public bath and washhouse (R. O. Allsop), 281; village institute (Grayson and Ould), 195

Desks, York council chamber, 352, 403

Destructor furnace, Corbett's, 663

Details: arches, iron, 413, 483, 559, 698, 902; cabinet, 422; church (Stapney, St. Philip) 806, 876, 912; drainage and plumbing, 593, 594, 766, 767, 768, 893, 896; fittings, York council chamber, 352, 369,

386, 403, foot bridge, timber, 106; hotel de ville, Oudenarde, 37, 316; land surveying and levelling, 4, 5, 101, 197, 278, 279, 304; municipal buildings, design, Oxford (H. T. Hare, selected), 40 (Perkin and Cheston) 70 (E. Runtz), 70; panels, 207; plinths, 7, 8; roof in steel, 416, 422; shadows, 170, 379, 649, 873, 909; skirting, 7, 8; sun-dial (Holyrood) 666; theatres, 139, 163, 309, 332, 383, 384, 556, 557, 590, 591, 693, 697, 766, 803, 932, 933; wainscoting, 161, 698, 699; wood-carving, 284

Detroit, architects' library at, 417

Dials, sun, Scottish, 212, 666

Dining-room, Seville's, W., 316

Distance, inaccessible, surveying, 32, 53

Doctors, Christ in the midst of the, 806

Domestic: architecture of Scotland, 203, 207, 212; work in stone, suggestive, 176

Door: panels, old, from Montrose, 207; spring and check, Blount, 825

Drainage: and plumbing details, 593, 594, 766, 767, 768, 893, 896; house, 792; town a layout, Paris, 790

Drawing: rooms (American) 614 (Princes-gate) 10; what not, 70

"Drawing" table, 176

Drawings: architectural "reader" in, 379, 649, 873; constructional (roof in steel) 416, 422 (timber footbridge) 106; Inigo Jones' (capitals) 630

Dressing-chest, an architect's, 453; table, 15th century satin-wood, 176

Dryburgh abbey, Sir W. Scott's tomb, 733

Dry rot, prevention of, 563

Dubrot brick and tile iron frame, 911

Dulwich: St. Barnabas' church, 666; West, extension of church, 350

Dunster: church, 212 (cool-screen) 693; market-house, 247

Durham: college of science, Newcastle, 212; University college chapel, 876

Darleigh, Bower farm, 234

Dwellings, improved industrial, Grosvenor estate, W., 630

EARTH, sand, and grass roofing, 143

Eastbourne, London and County bank, 666

East Quantockstead, house at: 234; chimney-piece in, 593

Eaton, Water, house at, 176

Electors, the Great, statue of, Berlin, 499

Electrolights, 284

Elizabethan cabinet, 490

Elmley Castle church, 733

Embankment, Ward's school for girls, 770

Endcliffe Woods, Sheffield, refreshment pavilion, 27

Entrance to pagoda, Rangoon, 310

Eversley house, Frodsham, 284

Excursion, Architectural Association (Somerset) 212, 241, 246, 263, 284, 593

Exeter, oak wainscoting from house at, 193

Exhibitions: (Academy decorative paintings) 106 (pictures) 386 (sculpture) 10, 453; home arts (furniture) 70; New Gallery (decorative paintings) 106

FARMHOUSES: Blackmore, 234; Bower, Darleigh, 234

Fastener, sash, Roger's, 8

Fate-led, by A. Tait, 10

Favourite, by H. C. Fehr, 10

Fewell church, pipit and scintling board, 212

Fever hospital, K-highley, 770, 787

Finland, wooden memorials in, 840

Fire-engine station, Grays, 490

Fireplaces: 281; Cornassery castle, 212; Hatton hall, 212

Firsden house, Bromsgrove, 803

Fish-st., E.C., St. Mary Magdalen's ch., 770

Fittings for new council chamber, York, 352, 369, 386, 403

Flats, residential, Morpeth terrace, S.W., 912

Flush tank and trough closet, Merrill's, 910

Foot bridge, timber, details, 106

Fountain, Raveston house, N.B., 203

Foxok, Burhill, billiard room, 702

Frame, Dubrot brick iron, 911

Free Classic in extremis, 614

Free libraries: Ayr, Carnegie, 490; Lawis-ham, 352; Poplar, 516; St. George, Hanover-square, 702; Whitechapel, 593

French 16th century arm-chairs, 607

Fuenterrabia, Calle Mayor, 352

Furnace, destructor, 633

Furniture: at Home Arts Exhibition, 70; bedroom (New York competition) 473; Boyd collection, 857; old English, 490; sketches, 142, 176, 193, 456 (from Magniac collection) 316; York council chamber, 351, 369, 386, 403

GALASHIELS cottage hospital, 935

Galilee, Winchester cathedral, 521

Gallery: Kilbirnie church, 212; National, altarpiece by Crivelli, 246; New, decorative paintings at, 106

Gardoba, old, 837

Gates, lyth, Wribbenhall ch., 803

Gates, wrot iron, 281

Gatways: Follok castle, 212; Toledo (South) 666

Genoa, plan of theatre, Charles Felix, 803

Giralda tower, Seville, 142

Girls' schools: Embankment, E.C. (Ward's) 770; Hong Kong, 753

Glass, looking, 70

Glenroy house, Finchley, 10

Gloster mansions, Cambridge-circus, 702

Gordon memorial shield, 17

Gorles-on-mariners' refuge, 420

Gosford House, N.B., 345, 352

Grand hotel, Clacton-on-Sea, 352; opera house, Paris, 383, 803

Grange house, Leominster, 633

Grass, sand, and earth roofing, 140

Grays, fire engine station, 490

Great: Elector, statue of, Berlin, 490; Marlow club, 630; Yarmouth, mariners' refuge, Gorleston, 420

Grey training college, Broun-bury, 422

Grosvenor industrial dwellings, Oxford st., 630

HADDON hall, the lower quad, 176

Hall chest, modern, 70

Halls: Haddon, 176; Hatton, N.B. (fireplace) 212; Stanmore (turret staircase) 142; Sydney (centennial) 381

Ham Hill, Kent, Christ church, 153

Hammerfest: cemetery, Finland, wooden memorials, 840

Hamstead, studio for Dandy Sailer, 733

Hastings new workhouse, 336

Hatton hall, N.B., fireplace, 212

Healey-on-Thames, Masonic buildings, 316

Hepplewhite: coach, 490; shield back chair, 490

Hereford, Prior's Moor, 633

Herefordshire nooks and corners, 631, 633, 633

Higher grade school, Manchester, 533

Holborn, Union Club, 456

Holman Hunt's Christ in the Midst of the Doctors, 806

Holyrood palace, Queen Mary's sundial, 636

Homes arts exhibition, furniture at, 70

Homes: convalescent (Perranporth) 316; proposed cottage, 284

Hong Kong, public school for girls, 753

Hospitals: Coventry (Bablake and Bond's) 840; Galashiels (cottage) 935; Keighley (fever) 770, 787; Stirling (Cowan's) 212; Willeddon (cottage) 598

Hotel de ville, Oudenarde, details from, 87, 316

Hotels: Clacton-on-Sea (Grand) 352; Manchester (Malay) 246

Hot-water works, cylinders and tanks for, 907

House drainage, 792

Houses: Alford, 840; Belfast, 876; Birke-dale, 383; Blackmore (farm) Somerset, 234; Botham, York, 490; Bower (ar.n.) Darleigh, 234; Buttis, Herefordshire (pigeon) 666; Caer-Hua, near Conway, 106; Cambridge-circus, 702; Coombe-park (boat) 316; Coltheolston (manor) 284; Detroit (interior) 417; Dunster (market) 245, 246; East Quantockstead, 284, 596; Eversley, Frodsham, 284; Firsden, Bromsgrove, 806; Foxok, Burhill (billiard room) 702; Glenroy, Finchley, 10; Gosford, N.B., 345, 352; Grange, Lominster, 633; Grosvenor estate, W. (industrial) 630; Hadlow (hall) 176; Hampstead (studio) 733; Hassey (hall) 526; Hyde Park court, Albert-gate, 736; Longford, Kent (cottages) 770; Marshfield (alms) 176; Mayfair, W., 806; Morpeth-terrace, S.W. (flats) 912; Mottis-ton, I.W. (manor) 562; Northwood, 666; of Parliament, Melbourne, 381; Old Catton, Norwich, 441; Osborne, I.W. (new wing) 386; Poundisford, 246, 234; Prestonbrook, Warrington (cottages) 934; Prior's Moor, Hereford, 633; Revolution, Whittington, 789; Rodd, the, Herefordshire, 661 (mantelpiece) 666; Rouen (old) 770; Selsdon-park, Sanderstead, 142; Seville-st., W. (interiors) 316; South Wraxall (manor) 176; Stanmore Hall (staircase) 142; summer (club designs) 352; Sunhill, Daisy Hill, Bradford, 422; Sunbury, Mapperton-park, Nottingham, 456; Sun-biton (villa) 456; The Nook, Beaulieu, 142; Toronto, 543; Water Eaton, 176; Weobley, 661; Welburn (hall) Kirby, Moorstead, 316; Weybridge, 770; Wig-ham, 316; Winton-place, 702

Hove, R.C. school, 630

Hurstmonceaux castle, 702

Hyde Park court, Albert-gate, 736

Hygienic stove, Wyw, 335

IMPROVED industrial dwellings, Grosvenor estate, W., 630

Inaccessible distance, surveying, 32, 53

Industrial dwellings, Grosvenor estate, W., 630

Infectious diseases hospital, Keighley, 770, 787

Inigo Jones, original drawings by, 633

Ionis caps, by Inigo Jones, 630

Institute, village, 195

Interior: decoration, by W. Hensman, 532; east-end, Nicholaston ch., 702

Interiors, two, of a London house, 316

Intermediate school, Port Talbot (W. L. Griffiths' design) 702

Invergowrie, All Souls' chapel, 562

Iron: arches of large span, 413, 483, 559, 698, 902; frame, brick and tile, 911; mantelpieces (cast), A. Stevens' designs, 893

Ironwork, wrought, by Rishleigh, Phipps, and Dawson, 284

Isle of Wight: architectural antiquities of, 562; Mottistoun manor, 532; Osborne house, additions to, 383

Italian: chairs, two, 142; wooden columns to organ, 736

JACOBEAN sofa, 490

Japanese stencil-but des gns, 840

Joinery and carpentry, 7, 8, 161, 698, 699

Jones, Inigo, original drawings by, 630

KEIGHLEY, fever hospital, 770, 787

Kenington: interiors, 49; Prince's-gate 10; museum (organ columns) 736

Kilbirnie church, family gallery, 212

King of Siam's palace, Bangkok, 347

Kirby Moorstead, Welburn hall, 316

Knill, Lord Mayor, portrait of, 483

LAMPS, wrought metal, 284

Land surveying and levelling, 4, 5, 93, 101, 197, 278, 279, 304, 512

Largely spin iron arches, 413, 433, 559, 638, 902

Large church, Montgomery monuments, 232

Leaning tower of Saragossa, 840

Leominster: church, Sussex, 702; the Grange house, 633

Levelling and land surveying, 4, 5, 92, 101, 197, 278, 279, 304, 512

Lewisham public library, 332

Library, public: Ayr, Carnegie, 490; Lewisham, 352; Poplar, 516; St. George, Hanover-square, 702; Whitechapel, 593

Library, an architect's, Detroit, 417

Lights, new, in old wall, 653

Llanelli town hall: 1st design, Simon and Tweedie, 526; 2nd, selected, W. Griffiths, 526

Local board offices, club designs, 912

Lodges: Sheffield, Carbrook recreation ground, 10; Radcliffe Woods, 27

Longford, Kent, cottages at, 770

Looking glass, modern, 70

Lord: Mayor Knill, portrait of, 483; Mayor's chair and desk, York, 403

Lower quad, Haddon hall, 176

Lunatic asylum, Coxlodge, Newcastle, 176; (2nd prem. design) 453

Lych gate, Wribbenhall ch., 806

MAGNAIC collection, furniture from, 3

Nicholas-in church, interior, east end, 702
Nooks and corners, Herefordshire, 681, 686, 688
Nook, the, Benhillton, Surrey, 142
North : Barr, N.B., sundial, 212 ; transept, Westminster Abbey, 806 ; Wales training college, Bangor, 912
Northwood, Pinner, house at, 686
Norwich, residence at Catton, 441
Nottingham : fittings in an architect's house, 456 ; Sunnyside, Mapperley park 630

OFFICES, local board, club designs, 912
Old : Catton, Norwich, house, 441 ; Cleeve abbey, 241, 248 ; English furniture, types of, 490 ; Fish-street, E.C., St. Mary Magdalen ch., 770 ; house, Rouen, 770 ; wall, new lights in, 652
Opera house, Paris, Grand, 393, 803
Organ, wooden columns to, 736
Original drawings by Inigo Jones, 630
Osborne house, I. W., new wing, 388
Oudenarde hotel de ville, details from, 87, 316
Oxford : cathedral, new altar and reredos, 680 ; municipal buildings designs (selected, H. T. Hare), 40, 70 (C. Bell), 40, 106 (J. B. Hinks) 40 (Perkin and Cheston), 40, 70, 142 (E. Runtz) 70
Oxford-street, W., Grosvenor estate industrial dwellings, 630

PAGODA, Shway Dagon, Rangoon, 310, 311
Paintings, decorative, at Academy and New Gallery, 106
Palace, Oats memorial church, 106
Palaces : Bangkok, 347 ; Holyrood (sundial at) 686 ; Osborne house, I. W., 383
Palma, Mallorca, courtyard in, 386
Palmer-park, Reading, pavilion in, 702
Pancels, old door, from, Montrose, 207
Paris : Chatelet theatre plan, 803 ; Grand Opera, 393, 803 ; tout a l'égout drainage in, 790
Parliament, houses of, Melbourne, 331
Parlour, Wightwick manor, 736
Patio at Palma, Mallorca, 386
Pavilion : Handcliffe Woods, Sheffield, 27
Palmer Park, Reading, 702
Penarth, All Saints church, 10
Perranporth, convalescent home, 316
Perspective, shadows in, 170, 371, 379, 524, 909

Pigeon house at the Butts, 686
Pipes, soil, details, 593, 594, 766, 767, 768, 895, 896
Plans : abbey (Old Cleeve) 248 ; bathhouse (club) 212 ; baths, public (and wash-houses, R. O. Allsop) 281, 475 (Aston) 702 (Walsall) 651 ; business premises (Bishopsgate-st.) 284 ; chapels (Blackheath, Wonerah, mission) 490 (Invergowrie, All Souls) 562 ; churches (Birling, district) 422 (Dulwich, St. Barnabas) 666 (Ham Hill, Kent, Christ) 159 (Minehead) 246 (Penarth, All S.S.) 10 (St. Decuman) 241 (Stepney, St. Philip) 770, 912 (West Dulwich) 352 (Weston-super-Mare, St. Saviour) 876 ; colleges, training (Bangor) 912 (Bromesbury) 422 ; convalescent home (Perranporth) 316 ; cottage homes (proposed Surrey) 284 ; cottage hospitals (Gala-shiels) 935 (Willesden) 596 ; cottages (Canadian summer) 702 (Longford, Kent) 770 (Preston Brook, Warrington) 934 ; destructor furnace, 683 ; footbridge, timber, 106 ; halls (Haseley) 526 (Wellburn, Kirby Moorside) 316 ; hospitals (Keighley, fever) 787 (Stirling, Cowan's) 212 ; hotel (Clifton, Grand) 352 ; houses (Alford) 840 (Belfast) 876 (Benhillton) 142 (Birkdale) 386 (Bootham, York) 490 (Daisy-hill, Bradford) 422 (East Quantockstead) 284 (Eversley, Frodsham) 284 (Firsden, Bromsgrove) 806 (Glenroy, Finchley) 10 (Gosford, N.B.) 345, 352 (Hyge-park-court) 733 (Mottistoun, I.W.) 682 (Northwood) 688 (Nottingham) 630 (Old Catton, Norwich) 441 (Osborne, I.W., new wing) 388 (Selsdon park) 142 (Toronto) 543 (Water Eaton) 176 (Weybridge) 770 (Wightwick manor) 736 (Windoor) 770 ; industrial dwellings (Grosvenor estate) 630 ; institute, village, 195 ; lodges (Sheffield, Carbrook recreation ground) 10 (Handcliffe Woods) 27 ; lunatic asylum (Oxbridge, Newcastle) 176 (2nd, Montgomery and Carr) 456 ; market house (Dunster) 246 ; manse (Seaton Delaval) 562 ; municipal buildings (Oxford, selected, H. T. Hare) 40 (do. C. Bell) 40 (do. J. B. Hinks) 40 (do. Perkin and Cheston) 40 (do. E. Runtz) 70 ; offices (local board, club) 912 ; opera house (Paris) 393 ; pavilion (Reading, Palmer-park) 702 ; police court (Wandsworth) 10 ; public libraries (Ayr, Carnegie) 490 (Lewisham) 352 (Poplar) 526 (St. George, Hanover-sq.) 702 (Whitechapel) 698 ; pulpit (Bedford-park, St. Michael) 883 ; refuge, mariners', Gorleston, 420 ; schools (Embankment, Ward's girls) 770 (Hong-Kong, girls) 753 (Hove, R.C.) 630 ; stability of walls on soils, 37 ; stables (Beech Holme, Colwyn Bay), 596 ; station, fire-engine (Grays) 490 ; shooting boxes (club) 456 ; summer-house (club) 352 ; sun-dial (Holyrood) 668 ; table (town clerk's) 369 ; technical schools (Manchester, 1st, Spalding and

Cross) 422 (2nd, Gibson and Russell) 456 (3rd, Runtz and Farrow) 456 (4th, T. Sington) 490 (Port Talbot, W. L. Griffiths) 702 ; theatres, 139, 237, 238, 239, 809, 382, 383, 384, 556, 557, 590, 591, 696, 697, 766, 803, 932, 933 ; towers (Oudenarde, hotel de ville) 316 (Prague, Powder) 596 (Saragossa, leaning) 840 ; town hall (Llanelli, 1st, Simon and Tweedie) 526 (2nd, selected, W. Griffiths) 526
Pleasure, by W. Reynolds Stephens, 106
Plinths and skirtings, 7, 8
Plumbing and drainage details, 593, 594, 766, 767, 768, 895, 896
Police-court, Wandsworth, 10
Pollok castle, gateway, 212
Poplar public library, 526
Porch, church, St. Giles, Cien, 770
Portrait of Ald. Stuart Kail, 493
Port Talbot technical school, W. L. Griffiths' design, 702
Position of timber, 352, 757
Poundisford house, 246, 284
Powder Tower, Prague, 596, 688
Prague, the Powder Tower, 596, 688
Premises : Bishopsgate-street Within, 284 ; Bradford (bank) 176 ; Cambridge-circus, 702 ; Cheapside, 876 ; Chester, 562 ; Eastbourne (bank) 666 ; Piccadilly (hotel) 246 ; Strand, 596
Preston-brook, Warrington, cottages, 934
Princes-gate, No. 49, drawing-rooms, 10
Princethorpe Priory, Ragby, stalls and screens, 876
Prior's moor, Hereford, 683
Priory, Princethorpe, stalls and screen, 876
Proposed cottage homes, Surrey, 284
Proscenium wall, theatre section at, 168
Public : baths and washhouses (R. O. Allsop's design) 281, 456, 731 (Aston) 702 (Walsall) 651 ; libraries (Lewisham) 352 (Poplar) 526 (St. George, Hanover-sq.) 702 (Whitechapel) 595
Puerta del Sol, Toledo, 688
Pulpits, church : Bedford-park, Chiswick (St. Michael) 386 ; Fenwick, 212

QUOD, lower, Hadon hall, 176
Quaintockhead, East house, 234 ; chimney-pieces in, 593
Queen Mary's sundial, Holyrood palace, 686

RANGOON, Shway Dagon pagoda, 310, 311
Rashleigh, Phipps, and Dawson, ironwork by, 384
Ravelston house, N.B., fountain 206
Reading, pavilion, Palmer-park, 702
Recreation ground lodge, Carbrook, Sheffield, 10
Refreshment pavilion, Handcliffe Woods, Sheffield, 27
Refuge, mariners', Gorleston, 420
Renaissance chair, French, 316
Rendu of architectural drawings, 379, 649, 873
Reredos, new, Oxford cathedral, 630
Residences : Mayfair, 806 ; Old Catton, Norwich, 441 ; Toronto, 543
Residential flats, Morpeth-terrace, Westminster, 912
Restored north transept, Westminster abbey, 806
Evolution house, Whittington, 769
River bath, tidal, 518, 618
Roath, Cardiff, Laidy chapel at St. Peter's, 333
Rodd, the, Herefordshire, 681 ; mantel-piece at, 686
Rogers's sash fastener, 8
Romulus and Remus, 456
Rood screens : Dunster, 596 ; Mulrhead (St. Michael's) 263
Roofing, sand, and earth, and grass, 140
Roof : Leominster church, Sussex, north aisle, 702 ; steel, 416, 422
Rooms : American drawing, 614 ; billiard, Foxhall, 702 ; decoration of, 662 ; Detroit, 417 ; Hampstead (studio) 736 ; Seville, street, W. (two) 316 ; Wightwick manor (parlour) 736
Rosa Mystica, by J. R. Spence, 106
Rosewood cabinet, club design, 422
Rot, dry, 583
Rouen, old house at, 770
Royal Academy : decorative paintings, 106 ; pictures, 386 ; sculpture, 10, 453
Rugby, Princethorpe Priory, stalls, 876
Ruins church, 241

SAINT : Augustine (Tonge Moor) 176 ; Barnabas (Dulwich) 666 ; Catherine (by Crivelli, National Gallery) 246 ; Decuman (Somerset) 241 ; George (Dunster) 212, 696 (Hanover-square, public library) 702 ; Mary (Caen, porch) 770 ; Mary (Taunton) 284 ; Mary Magdalen (Old Fish-st., E.C.) 770 ; Michael (Bedford-park, Chiswick, pulpit) 386 (Michehead) 246, 253 ; Michel (Mont de, crypt) 421 ; Paul (Addiscombe) 806 ; Peter (by Crivelli, National Gallery) 246 (Roath, Cardiff) 333 ; Philip (Stepney) 770, 806, 840, 876, 912 ; Saviour (Weston-super-Mare) 876
Salisbury cathedral spire, 912
Silon : sculpture at the, 456 ; west, 49, Prince's-gate, 10
Sand, earth, and grass roofing, 140
Santerstead, Salsdon Park, 143
Sanitary crusade, a, 310, 311, 347, 381
Saragossa, leaning tower of, 840
Sash fastener, Rogers's, 8

Schools : Carlisle (board) 806 ; Embankment (Ward's girls) 770 ; Hong Kong (girls) 753 ; Hove (R.C.) 630 ; Manchester, higher grade, 562 ; Manchester, technical, designs (selected, Spalding and Cross) 422, 490 (2nd, Gibson and Russell) 456 (3rd, Runtz and Farrow) 456 (4th, T. Sington) 490 ; Port Talbot technical (W. L. Griffiths' design) 702
Science, college of, Newcastle-on-Tyne, 212
Scotland, castellated and domestic architecture of, 216, 207, 212
Scott's (Sir W.) tomb, Dryburgh abbey, Screens, road : Dunster, 596 ; Minchael, 736 263 ; Princethorpe Priory, 876
Sculpture : academy, 10, 456 ; Salon, 456
Seaside bath-house, club designs, 212
Seaton Delaval, manse, at, 562
Seats, York council chamber, 352
Sections : arch, iron, 413, 559 ; bath-house, seaside, 212 ; baths (Aston) 702 (by R. O. Allsop) 731 ; cabinet, 422 ; church (Stepney, St. Philip) 770, 876 ; deluge adamant, 558 ; destructor furnace, 683 ; drainage (house) 792 (tout a l'égout) 790 ; foot-bridge, timber, 106 ; house (Firsden, Bromsgrove) 806 ; library, free (Poplar) 526 ; market-house (Dunster) 246 ; manse (Seaton Delaval) 562 ; mission chapel (Blackheath, Wonerah) 490 ; municipal buildings, Oxford (Perkin and Cheston's design) 142 ; offices, local board (club) 912 ; opera house, Paris, Grand, 392, 802 ; shooting boxes, 456 ; slipper baths, 475 ; soil pipes, 593, 594, 766, 767, 768, 895, 896 ; theatres, 168, 3, 9, 933 ; tower (Prague, Powder) 688 ; town hall (Llanelli, 1st, Simon and Tweedie) 526 ; wall, Oxford municipal buildings designs (H. T. Hare, Perkin and Cheston, and Runtz) 70 ; water-silo (champion) 374 (tank and trough) 910
Self-acting sash fastener, Rogers's, 8
Selsdon Park, Santerstead, 142
Semi-detached : houses, Belfast, 876 ; villa, Surbiton, 456
Seville : st. W., interiors of house in, 316 ; two towers in, 142
Shadows in perspective, 170, 371, 379, 524, 909
Sheffield, lodges : Carbrook recreation ground, 10 ; Handcliffe Woods, 27
Sheraton corner cabinet, 493
Shield : back chair, 490 ; Gordon memorial, 10
Shooting-box, club designs, 456
Shorham, New, church, 451
Shway Dagon pagoda, Rangoon, 310, 311
Siam, palace of King, Bangkok, 347
Sideboard, William and Mary, 176
Sign wrought iron, 234
Sites, theatre, 139
Sketches, Sussex, 701
Skirtings and plinths, 7, 8
Slipper baths, 475
Slopes, chaining on, 101
Sofa, Jacobean, 490
Soil pipe details, 593, 594, 766, 767, 768
Soils, stability of walls on, 37, 133, 212, 277, 419, 518, 624, 801, 904, 905
Somersetshire, A.A. excursion to, 212, 214, 246, 253, 284, 596
Sounding board, Fenwick church, 212
Southdown sketches, Sussex, 702
South : Kensington museum (columns to organ) 736 ; Wrexall manor house, 176
Southport, house at Birkdale, 333
Spanish towers, three, 142
Span, large, arches of, 231, 413, 483, 659, 698, 902
Specification, draining and plumbing, 593, 594, 766, 767, 768, 895, 896
Spire, Sarum, from Firsden's garden, 912
Spring, door, Blount, 825
Stability of walls on soils, 37, 133, 212, 277, 419, 518, 624, 801, 904, 905
Stables, Beech Holme, Colwyn Bay, 596
Staircase : plans, theatre, 696, 697, 766, 833 ; turret, Stanmore hall, 142
Stalls, Princethorpe Priory, Ragby, 876
Stanmore hall, turret staircase, 142
Station, fire engine, Grays, 490
Statues : Berlin, Great Elector, 493 ; Cardinal Manning, 456
Steel, roof in, 416, 422
Stencil out designs, Japanese, 840
Stepney, St. Philip's church, 770, 833, 841, 876, 912
Stevens, Alf., mantle piece design, 893
Stirling, Cowan's hospital, 212
Stone : arches, 231 ; cornice, 91, 161 ; suggestive domestic work in, 176
Stove, Wyvy hygienic, 335
Strand, business premises in the, 536
Street in Fauterabla, 332
Stullo, Dandy Sadler's, Hampstead, 735
Suggestive, domestic work in stone, 176
Summer cottage, Canadua, design for, 702
Summerhouse, brick, club design, 352
Sundials : Holyrood palace, 686 ; Newbattle abbey and North Barr, 312
Sundell, Daisy Hill, Bradford, 422
Sunnyside, Mapperley-park, Nottingham, 630
Surbiton, semi-detached villa, 456
Surveying : inaccessible distance, 32, 63 ; land, and leveling, 4, 5, 92, 101, 197, 273, 279, 304, 512
Sussex sketches, 702
Sydney, municipal buildings and centennial hall, 381

TABLES : centre York council chamber 386 ; circular, 367 ; "drawing," 176 ; 18th century dressing, 176 ; Queen Anne, 490 ; town clerk's, York, 369

Tank and trough closet, Merrill's, 910
Tanks and cylinders for hot water works 907
Taunton, St. Mary's church, 284
Technical schools : Manchester, designs (selected, Spalding and Cross) 422, 490 (2nd, Gibson and Russell) 456 (3rd, Runtz and Farrow) 456 (4th, T. Sington) 490 ; port Talbot (W. L. Griffiths) 702
Temple at Shway Dagon pagoda, Rangoon, 311
Tnams Embankment, Ward's school, 770
Theatres, plans and details, 139, 168, 237, 238, 239, 309, 382, 383, 384, 556, 557, 590, 591, 696, 697, 766, 803, 932, 933
Tidal river bath, 544, 618
Tile iron frame, Dubrot, 911
Timber and its position, 652, 757 ; foot-bridge details, 106
Toledo, Puerta del Sol, 688
Tomb, Sir W. Sotheby, Dryburgh abbey, 736
Tonge Moor, Bolton, St. Augustine's ch., 176
Toronto, residence at, 543
Tout a l'égout drainage, Paris, 790
Towers : Old Fish-street, E.C. (St. Mary Magdalen) 770 ; Oudenarde (hotel de ville) 316 ; Prague (Powder) 596, 688 ; Saragossa (leaning) 840 ; Spanish (Seville and Cordova) 141 ; Taunton (St. Mary) 284
Town clerk's chair and table, York, 369, 443
Town halls : Llanelli (1st, Simon and Tweedie) 526 ; (2nd selected, W. Griffiths) 526 ; Oudenarde (hotel de ville) 316 ; Oxford (designs by H. T. Hare (selected) Bell, Hinks, Perkin and Cheston, and Runtz) 40, 70, 106
Sydney, 381
Training colleges : Bangor (North Wales), 912 ; Bromesbury, 422
Transept, north, Westminster abbey, 806
Traps, 594
Traveling with the chain, 4, 5
Trough closet, Merrill's, 910
Tubingen, the mark-place, 562
Turret, plan of Theatre Royal, 803
Turret staircase, Stanmore hall, 142
Twyford's deluge adamant, 558

UNION club premises, Holborn, 456
University college chapel, Durham, 876

VAULTING in Winchester cathedral, 620, 521, 628
Ventilating : pipes, 895, 896 ; sash fastener, Rogers's, 8
Victoria, E.C., cathedral designs : by "Ars," 596 ; by "Dugmo," 108
Victoria-st., S.W., flats in Morpeth-terrace, 912
Village institute, a, 195
Villas, Surbiton, semi-detached, 456

WAINSCOTING : details, 181, 693, 699 ; oak, iron house at Exeter, 193
Wales, North, training college, 912
Wall : old, new lights in, 652 ; proscenium, theatre section at, 168
Walls, stability of, on soils, 37, 133, 242, 277, 419, 518, 624, 801, 904, 905
Walsall public baths, to plan, 651
Wandsworth police-court, 10
Ward's school for girls, Embankment, 770
Warrington, cottages, Preston-brook, 934
Wash-houses, public, by R. O. Allsop, 281, 475, 731
Water : closet (champion combination) 374 (flush tank and trough) 910 ; Bath house, 176
Weobley, old houses at, 681
Wellburn hall, Kirby Moorside, 316
West Dulwich, church extension, 352
Westminster abbey, restored north transept, 806
Weston-super-Mare, St. Saviour's ch., 876
What-not, drawing, 70
When the world was young, by E. J. Poynter, 106
Witchcourt, Oxon, bathhouse, Coombe-park, 316
Whitechapel free library, 596
Whittington, old Revolution house, 736
Wightwick manor, additions to, 736
Willesden cottage hospital, 596
Winchester cathedral, sketches in, 523, 521, 526
Windsor, house near, 770
Wing, new, Osborne house, I.W., 386
Wiston-place, Sussex, 702
Wolf, children of the, Frampton's, 456
Woman, head of, by A. C. Lachet, 10
Wonerah, mission chapel at Black Heath, 490
Wooden : columns to organ, S. Kensington museum, 736 ; memorials, Hammerfest, 840
Wood vaulting in tower, Winchester cathedral, 526
Workhouse, Hastings new, 386
Workmen's village institute, 195
World was young, when the, 106
Wrexall, Sou'h manor house, 176
Wribbenthal, Lych gate, 806
Wrought iron work, examples of, 231
Wyvy hygienic stove, 335

YARMOUTH, mariners' refuge, Gorleston, 420
York : fittings for new council chamber, 352, 369, 383, 403 ; houses at Broomham, 490

THE BUILDING NEWS

AND ENGINEERING JOURNAL.

THE CLERK OF WORKS AND HIS DUTIES.

IT is not always easy to find a good clerk of works; and for want of method, management, and direction, it is possible that, however good, he may be of little use when found. Every profession contains a few discreditable members, and more than a few incompetent ones; so that if both sorts may at times be met with amongst clerks of works, it is no more than can be said with truth of any equally numerous body of men. The clerk of works who is in the builder's pay is much talked of, but little seen. Contractors do not commonly stoop to bribery; and if they did, a competent man would not find it worth while to throw away his chances for life by accepting bribes. The incapable clerk of works is much less rare than the dishonest one: and the idle clerk of works, too, is by no means unknown. Perhaps there is something in the nature of the employment which encourages and develops idleness where there is naturally a tendency to it. When the builder is careful and straightforward, and when everything is going on smoothly, it may happen for long periods together that the clerk of works finds no great reason to exert himself much. This absence of exertion may grow into a habit: and then, woe to its possessor when he is placed in circumstances which call for energy and decision.

One meets with two opposite notions—both wrong—of what energy and decision in this sphere really mean. "You will find me a thoroughly energetic man," said a clerk of works to an architect not long since. "For instance, when I was superintending Mr. X's house in North Wales, a year or two ago, the contractor sent us a truck-load of bad bricks. Well, I did not lose an hour in telegraphing to London for the architect to come down, and the moment he saw the bricks he agreed with me that they were a bad lot." Here was a man who thought he had displayed wonderful activity simply because he had shirked his own clear duty, which was to condemn bad materials, and had imposed on the architect a needless journey of five or six hundred miles. Of course, this man, whom we may call A., did not retain his appointment for many weeks. B., who was employed on a large public building in the North of England, erred, on the contrary, in the direction of too much self-reliance. He was always ready to settle every sort of question, no matter whether it referred to planning, to construction, or to design, without consulting the architect at all. When that functionary visited the works, and found all sorts of features and contrivances introduced which he had never dreamed of, B.'s ready explanation was, "We did not want to trouble you." At last B. was pleased, in the architect's absence, to alter entirely a large and very conspicuous part of the roof. He had

failed to see clearly what was intended there, and instead of sending a letter or a postcard to inquire, had produced, from his own head, one of the most appalling monstrosities ever erected. In short, he had troubled the architect, not for a day, but for a lifetime. So it always is with the builder, or the foreman, or the clerk of works, who oversteps his own province. He may find it pleasant to attempt the architect's duties; but he should remember that it is the architect, and not he, who will bear the blame if those duties are not properly discharged.

The business of the clerk of works is to get his building erected according to the drawings and specification; but, at the same time, to call the architect's attention to any difficulties in working to them, and to any weighty reasons which may occur to him at any point for deviating from them. He has especially to see that the materials and workmanship are everywhere of the quality contracted for. If they are not, he is to exercise his power of rejecting them. If he and the builder differ about their quality, they can send a specimen to the architect, on which he can give a final judgment. There are cases, of course, in which he must visit the works before doing this; but there is no need to bring him down for every ill-burnt brick or sappy board that has to be sent off the premises. The chief use of a clerk of works, in most cases, is just to condemn such things as these, and to get them removed; and if he cannot do as much as that, there might almost as well be no clerk of works at all.

Another part of his business, and a very important one, is to see every portion of the work properly completed. Some contractors have a way of nearly, but not quite, finishing. They will leave out the beam-filling here, and the flashings there; they forget to connect the drains with the sewer; they omit to order the casement fastenings; and where they have made mistakes, they will delay, and delay, and delay again, to rectify them according to the architect's instructions. This, for the time, may save them a few shillings, and even, if the items are eventually overlooked, a few pounds. But they are sure to hear of these things at last; and the architect, if he is wise, will consider that time is too short to justify him in employing men who waste so much of it, and will take good care to strike them off his list. It is where there are contractors of this sort that a really good clerk of works makes himself most valued. He looks out for, and makes exhaustive lists of, all such omissions; especially he notes down the errors which have to be altered, and then, undeterred by delay and shuffling, he gives the foreman no peace till every item is really complete. The idle clerk of works leaves the architect to remember such things himself, and unless he does remember them, and asks about them at every visit, will trouble

no more about them. There is not much use in a man who lets things escape him in that way.

If the architect is at a distance, he should be told at intervals of a few days, exactly how far each part of the work has proceeded, and whether he is far or near, a permanent record should be preserved, by which it can be precisely known at any length of time after completion, at what stage each part had arrived in any given week. A mere description will not always answer this purpose. A man may be an admirable clerk of works without having the power of literary composition, and even if he has it, he will find it a tedious and troublesome thing to explain, in words alone, exactly how far the walling and roofing, the joinery and plastering, or the plumbing and painting had got by a particular day, in every portion of a complicated structure. By way of assistance, it has been found useful to lithograph on the back of each weekly report which the clerk of works sends in an outline plan of the building to a fairly large scale. He can then write, for instance, on each wall, under date, say of July 1, 1892, its average height above the datum. One may be marked 6ft., another 10ft., another 0, with a note, "damp-course being put on"; and the same principle may be carried out in the successive trades till all are complete. A set of outline-plans like this, filled in and dated from week to week, is a great protection, both to the architect and to the owner. Complaints of having had to "wait for details" can in this way be checked, and settled one way or the other, no matter at what period they may be made; and inexcusable delays on a builder's part can be brought home to him with something like certainty. The clerk of works should also keep a careful list of all the drawings sent him, and of the dates of their arrival. The architect's visits, too, should be noted down, without exception.

The clerk of works should ask for drawings and directions in good time. It is a great mistake to neglect this till it is almost too late for a reply. An architect may be engaged in many different ways when a belated request of this sort arrives, or he may be away inspecting buildings in a different part of the kingdom. Then, again, the clerk of works should have all his questions written down in readiness for each of the architect's visits. Care and order in this matter save much time and prevent many errors. It is a bad sign when an architect has to find out for himself the points in which the work or the materials differ from those specified. If anything is wrong, he cannot be informed too soon: there is no worse policy, either for the contractor or for the under-superintendent of the works, than that of trying to keep him in the dark. The sooner an inaccuracy is pointed out to him the easier it is to rectify it; it is the attempt to avoid

rectifying, to hide things up and say, "Oh, he will never see them," which leads to serious trouble in the end. No architect, if he is possessed of common-sense, will retain a clerk of works who uses him in this way. He will recognise the kind of man he is dealing with: the kind which is in league with bad masons, helping them to hide flaws by means of stone-dust and shellac; or with bad bricklayers, showing them how to patch up broken bricks with coloured cement; or with bad joiners, who are bunglers with wood but artists in putty; the sort of man, in short, who leaves out dowels, narrows lead flashings, lets the lap of the slates take its chance, rejoices in snapped headers and joints not flushed up, passes stone worked on the wrong way of the bed, and is only anxious that the building should show a fair face till he is paid off and done with. After that sort of man comes the deluge.

A well-meaning man of the very opposite type sometimes causes much trouble by going beyond his powers. In his case, the building goes on satisfactorily till its close; and even afterwards there is no fear that the evils will appear which result from the employment of the secretive man. The work, in short, is really well done. It is when the accounts come in that difficulties begin. "What is this?" says the architect, as he looks down the bill of extras and finds a claim for several hundred feet cube of additional stone. "Oh, that," replies the contractor, "results from the way in which the clerk of works insisted on our executing the main arches. They were taken in the contract as being in separate orders, with bond-stones at intervals; but Mr. D. told us to sink the three orders out of a single stone." "Did you not know," replies the architect, "that Mr. D. had no power under the contract to order extras of any sort?" "Well, the general conditions say so; but he told us to do it, and a builder does not like to oppose the clerk of works. At any rate, your clients have got the benefit of the alteration, and I hope they will not hesitate to pay for it." So it goes on with item after item. The building, which had been carried out without any departure worth naming from the original design, is saddled with a heavy bill of extras, and the architect, who neither ordered them, nor, in many cases, knew of them, has to bear the blame. Plainly enough, Mr. D., instead of ordering things to be done which he had no power to order, ought to have referred all such questions to his superior. If the extras were necessary, they could then have been agreed to by the owner as the work went on. People do not like unexpected claims to be sprung upon them after a building is completed.

One more point remains: the best way of carrying on the correspondence between the architect and the clerk of works, when the latter is employed at a distance. He will constantly be receiving questions to which answers are required; and, on the other hand, he will often be asking such questions. If this is done by letters on each side, much time is likely to be wasted. It is not every man, however fit he may be for the post of under-superintendent, who can write a short, business-like letter, easily legible, and giving just the information that is wanted. But any man can write down "Yes" or "No" to a plain question. If he is once cut off from fine words and attempts at composition, he may even venture further without becoming unintelligible. A good way of cutting him off from these, and keeping him to the subject in hand, has been found in the use of sheets ruled in two columns, one headed "questions," and the other "answers." If the architect wants to know about any points, he writes in the "question" column, and numbers his queries 1, 2, 3, &c. The clerk of works replies in the "answer" column, heads his replies with the same numbers, and then returns the whole sheet, showing ques-

tions and answers side by side. When it happens that he wants information, he takes a similar sheet, and writes in the "question" column, the architect replying in the other. These sheets, when preserved, form a sort of history of the building, and show at once what orders for alterations were given, and at what dates.

ARCHITECTURAL EXAMINATION PROGRAMMES.

MANY schemes of examination have been proposed for students of architecture, and we may expect others based on those which the leading professional bodies in Europe and America have formulated. As we have argued before, no scheme will be successful or meet the requirements of the younger men about to enter the profession if it does not provide for the several grades of candidates or men of differing mental calibre and qualifications; but as far as we have seen this natural division has not been adopted. Thus the man who is a born architect has to pass through the same examination as he who is a born mathematician; the man who has made styles and ornament and drawing his principal forte has to compete with the candidate who has had some experience in the practice of construction, or is an expert in quantities, the valuation of property, &c. Up to a certain point, indeed, we cannot legislate for differences of aptitude or mental endowment, as it is necessary to make a professional examination so far complete and many-sided, that he who qualifies may possess a passport of his competence in all these branches; but why should there not be an opportunity afforded to a candidate endowed with particular gifts or qualifications to enter a class adapted specially to his needs, in order that the number of marks required to pass the given subjects may be proportioned to the candidate's powers, or bear some direct relation to his natural capabilities and educational position. It will no doubt be objected to this arrangement that a man may be admitted to practice who has won very few marks in the groups relating to architecture proper, and be able to compete on equal grounds with those who are more competent as architects; but this objection is not so strong or fatal to the true artist as may be imagined. Even if the individual who has barely gained the minimum of marks for art competes with his more competent brother, he will have very little chance of taking a lead; but, as a matter of fact, he will soon begin to find out that architectural design is not his strong point, and will hesitate to go in for such work. He will soon discover the branch for which he is more suited, and by a natural law of "selection" he will seek those fields of practice which are more congenial to him, and in which he is better able to wage a warfare with profit. This finding out one's level is a process which takes place in every business and vocation. Why is it that men like Mr. Waterhouse, Mr. Pearson, Mr. Jackson continue to take the lead in architecture? Have they not won it by the exceptional merits of their works? Others, no doubt, are close at their heels who will in time take their place. Examination will not alter this state of things, any more than schooling or university education will insure success in any profession. Natural ability and energy alone will do this. We need not, therefore, fear the result of allowing every candidate to devote himself to those studies for which he is most fitted, for we may rest assured that natural ability in any one direction will always give him a priority in practice.

We therefore think it necessary that, in the schemes for architect's examinations, promoters should arrange for special branches, as the Surveyors' Institution have esta-

blished in their "special" certificate examinations, by which candidates who are members of the Institution can take up either agriculture or forestry, sanitary science, or land surveying and levelling. In the ordinary qualifying examinations the same division of subjects is recognised, embracing land agency, valuation, and building, so that students can be examined in any of these sub-divisions they prefer, and there are classes for students, non-students, and fellowship. By allowing candidates to take up either architecture and art, construction or surveying, the examinations might be made popular, and a larger number of young men would avail themselves of the opportunity. The Royal Victorian Institute of Architects of Melbourne have issued a programme of their Examination to qualify for candidature as associates, which is of interest. The examination is to be written, graphic and oral, and every candidate must be of the age of 21 years. He is required to submit a statement as to his general education, proofs of his ability in drawing; the probationary work to be any drawings of the student's own design fully drawn out as working drawings to a scale of $\frac{1}{4}$ in. to the foot, fully figured, with details of construction and ornament, and a perspective view, also a drawing of architectural ornament, Classic or Mediæval, from the round. These, however need not be expressly made for the examination, and will be returned after. A fee of three guineas is required in sending an application. The number of marks is 1,000, divided in certain proportions for the different subjects. The most important feature of the examination is that a candidate can take any one of three groups, A, B, or C, in successive examinations, instead of the whole; but he must obtain two-thirds of the total number of marks of each group, and not less than one-half of the marks in every subject. The groups are:—A, history and characteristics of the styles of architecture; mouldings, features, and ornaments to be illustrated by sketches characterising the styles; geometrical and perspective drawing. Group B includes shoring, sanitary science, water and gas supply; properties and application of materials; principles and practice of construction. Group C comprises drawing and designing, planning and arrangement, taking a building for a given purpose; specifications, quantities and professional practice, including conditions of specification or contracts; public health regulations, building regulations, &c. Each of these subdivisions or subjects in each group has a certain number of marks attached. A candidate to pass must obtain half the total number of marks, but not less than one third of those in every subject if the programme is taken as a whole. Thus for Group A the total number is distributed as follows:—For history and characteristics of styles illustrated, 100 marks; mouldings, features, and ornament illustrated, 125 marks; geometrical and perspective drawing, 75 marks, or total of group, 300 marks. In the next group B, 25 marks is put down for shoring, 100 for sanitary science and water supply; 100 for materials, and 100 for principles and practice of construction, making a total of 325 marks. In Group C, 125 marks each is given to drawing and designing, and planning and arrangement, 50 to specifications, and 75 to quantities and professional practice, making in all 375. These are the main outlines of the programme of subjects, which is accompanied by a list of suggested books. Candidates are recommended to practise sketching in perspective, as illustrations and answers thus sketched will receive more marks. No certificate is to be given nor results announced until the candidate has passed in all the groups. It will be seen from this programme that the highest number of marks is allotted to Group C. It is also to be noticed that

mouldings, features, and ornament; drawing and designing, and planning, each has the largest number of marks attached—namely, 125. The two last subjects are, indeed, the most important from an architect's point of view, though we think a more logical distribution of subjects would have been to confine Group C to "designing and planning," placing drawing earlier, next after geometrical drawing and perspective. A fourth group for professional practice seems to suggest itself.

The subjects should have some affinity in each group. A knowledge of styles, history of typical buildings, mouldings and features, demands acquisition of facts, and the faculties of discrimination and memory are chiefly involved. Drawing is an aptitude which calls into play another kind of power: the eye and hand are jointly engaged with the mind, and a knowledge of geometry or projection is a necessary accomplishment. There is also a very real distinction between drawing as a means of representation in delineating objects and buildings and designing power, as every artist is aware. It is possible to make a geometrical elevation of a given building, or even a perspective of one, without having the skill or inventive faculty to design a building. The last operation is purely mental and imaginative, whereas drawing is simply the mode of expressing ideas, though the more skilful a man is in the use of his pencil, the greater facility he has. In planning, actual data are necessary in addition to the artistic function. These subjects, therefore, necessarily come after the attainment of the properties, and application of materials and principles of construction, and also after the knowledge of the characteristics of styles, mouldings, and features, all of which are matters that must be taught from books, classes, and actual buildings. It may be difficult indeed to draw any hard-and-fast lines between groups of facts so intimately related as those of styles and construction; nevertheless the framers of an examination programme must distinguish between subjects which can be learned and those which to a large degree depend on the invention and imagination of the candidate.

RAINFALL: ITS DISCHARGE AND STORAGE.

THE heavy, and in some cases serious, rainfalls we have experienced of late ought to teach drainage engineers and builders the importance of providing for some of that surplussage of water which, if neglected, causes such havoc in the lower districts of our towns in addition to other and worse evils. It is the practice now to use small drain-pipes and sewers, because we are told they cleanse themselves better, and are more economical in results than large ones—a theory which is perfectly true regarded from a strictly scientific point of view, but which does not hold good when an unusual rainfall occurs, or when we consider that a drain has not simply to convey water, but solids and other extraneous substances that are likely to adhere to the sides and cause obstruction. A similar theory is held by some engineers in the design of iron structures: they are fond of advocating small factors of safety on the ground that members in compression and tension, if made larger than bare theory requires, add unnecessary weight without increasing the real strength of the structure. To such we may say that theoretical formulæ do not take into account all the conditions required for practice, for proof of which we can refer to the repeated failures of American bridges, which are generally constructed on minimum data. When we are told that, allowing for a rainfall of, say, 1in. per hour, a 4in. drain laid at a small inclination will discharge all the drainage of a

building containing 20 people, and having an area of 11,000 superficial feet, we must accept the statement with caution, as this calculation does not take into consideration the risks of badly-laid and jointed drains, bends, the reductions of the full bore of the pipe caused by partial obstructions and the hundred other accidents to which house-drains are exposed. The effect of a clumsy joint, incrustation, settlement of ground, or a sharp bend, is to diminish materially the discharge through a pipe. Can it otherwise be explained why so many houses of small size drained by 4in. drains suffer from any unusual rainfall? In a number of districts in London a sudden or continued rainfall entirely disorganises the system; the basements are invariably flooded with diluted sewage water, the gullies get clogged, and offensive odours make themselves perceptible in the house. No doubt imperfect jointing and laying are accountable for many of these grievances; but they only prove the desirability of employing a size of pipe that will reduce the risks to which all ordinary drains are subjected whenever a more than usual rain occurs. The small drain-pipe under heavy rains is liable to run quite full and be subject to pressure. Hydraulicians have not themselves agreed as to the amount discharged through a pipe. Comparing the results of Eytelwein's formula with that of Neville's or Darcy's, we find differences, the first showing a larger discharge than that of the second or third, as any set of tables based on these formulæ will show. But confining our attention to practical matters, the loss of head in a water-pipe, due to a bend or an elbow, is a perceptible quantity, and if these are numerous, the loss is considerable; also it must be considered that the smaller the pipe the greater is the resistance of the bend. In the discharge of drainage through a small pipe, therefore, the straighter the pipe the better.

Architects and builders are not generally experts in determining how large drain-pipes should be to carry off heavy rains, and to what slope they should be laid. These are questions left to the builder or drain-layer or are decided by reference to ordinary practice. The pipes should at least be large enough, that they should flow partially full; should be inclined enough, so that the velocity be sufficient to keep the pipes clean. For small pipes the velocity ought, of course, to be greater than for large ones, and it has been laid down that for small drains of 6in. to 9in. in diameter, the velocity ought to be at least 3ft. per second, and for large ones where the water forms a large proportion of the discharge, not less than 2ft. per second. Very few ordinary house-drains fulfil these conditions of velocity.

According to a table calculated on Darcy's formula, a pipe 320ft. long, with a maximum discharge of 4c.ft. per second, and having a fall of about 3ft., ought to be 12in. diameter, which will run nearly full. The velocity of discharge is calculated at 5.4ft. per second, sufficient to keep it clear without flushing. In other words, the length of pipe divided by the inclination multiplied by the square of maximum discharge per second, or $\frac{320}{3.1} \times 4^2 = 1,650$, gives a value which corresponds with a diameter of 12in. In many drains of this length and fall a pipe of 6in. is thought enough. When the wetted perimeter is large in comparison with the amount of water, a small velocity is obtained, and flushing becomes important; but the main consideration is to make the pipe large enough to discharge the maximum quantity of rainfall without being quite full.

The question of storage has not been much considered in towns; perhaps the collection of rain-water would, considering the smoky state of the atmosphere in large towns, be scarcely

of any value. But why should not the "rain-water separator," such as that of Mr. Roberts, be more generally fitted up to ordinary houses, by which contrivance the first showers and cleanings of roofs and gutters runs to waste, while the after clean rainfall is stored? Anyhow, there may be some plan of collecting the rain-water after turning a tap to allow the first scourgings to be run to waste. No great expense would be entailed by a receptacle properly situated for collecting the cleaner water during heavy rains, which apparatus might be manipulated from the house. The present indifference about town rainfall collection, the allowing house-pipes to discharge into gullies, is no doubt owing to the ample water supply obtained, and it is thought justly, that as the drains want periodical flushings, the best plan is to utilise the rainfall for this purpose. But the irregularities of Pluvius have long taught us that we may have more rain than is good for us, that the Clerk of the Weather may sometimes bestow on one district or area a larger portion of his favours than another, and that if it were not for means of outlet his bounty would mean deluge. The surplus water often does incalculable harm in saturating the soil beneath our houses, in causing the sewers and drains to disgorge themselves, and to back-water our premises. We have to consider the means of diverting this overabundance. The reservoir-sewer or the storage-tank is available. The former, we know, has been objected to, because it increases the volume of dangerous gases, and adds to the cost. No doubt, good reasons in certain circumstances; but the large sewer has advantages in towns where temporary storage is a necessity, and of which we could point to several which have only been relieved by large outfalls and storage tanks. The second alternative of storing rainfall is the most desirable in many towns in the Midlands. But the town unit is the house and its curtilage, and here something more can be done than we are in the habit of doing. When we think that every quarter-inch of rainfall gives thirteen gallons on every 100ft. of area, or on a space of lead flat or yard of 10ft. square, we see the value of diverting or saving some of this. If we take an ordinary London house and its yard or back area, say a plot 95ft. deep by 20ft. in frontage, we get 1,900sq.ft. yielding 247 gallons, which, allowing 23 gallons for each individual per day, will provide for eleven persons; but if only used for washing and cleansing purposes would supply at least double that number. But as we get rainfalls of over 1in. or 1½in. per hour, we may soon calculate the large quantity of water that might be stored in the course of a few days' heavy rainfall in the year by a small outlay for storage reservoirs or tanks. In these days of monopolising water companies and river pollution, the subject is one that deserves the serious attention of every sanitary authority, property and house owner. The subject is at least a practical one for the architect as well as the engineer, upon the latter of whom has mainly devolved all questions of hydraulics as applied to building.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE closing meeting for the present session of the Royal Institute of British Architects was held on Monday evening, the President, Mr. J. MacVicar Anderson, in the chair, the chief business being the presentation of the Royal Gold Medal, which this year had been awarded by the council, with Her Majesty's permission, to M. César Daly. The President, in making the presentation, remarked that in their recommendation of a recipient for the honour, the council recognised no merely local, or metropolitan, or even national limit; the sphere of

selection was as unrestricted as that of art itself—it was the wide world, a consideration which materially added to the value of the honour. They had that year recommended to the Queen the name of one who was a veteran in the world of art, a giant when measured by the products of his pen, one whom they were proud to honour as a distinguished Frenchman, the octogenarian M. César Daly. Few could point to such monuments of literary research as embodied in the pages of the "Revue générale de l'Architecture et des travaux publics." Few there were who had found time and energy to publish such a series of important architectural works as "Motifs historiques d'Architecture et de Sculpture d'Ornement," "L'Architecture privée au XIX^e siècle," "L'Architecture funéraire contemporaine," "Mobilier d'Eglises," "Cours de Constructions," to say nothing of endless brochures and more fugitive essays which had emanated from his prolific imagination. Such a record as this, one would think, would be more than sufficient to satisfy the most ambitious author, but M. César Daly contemplated the compilation of no less a work than a dictionary of architecture. The President proceeded to give a biographical sketch of the medallist's career. Born in France in 1811, César Daly was, he explained, brought at an early age to England, where he was educated, remaining till he was 15 years old. Returning to France in 1826, he attended classes at the College of Douai; at 16 he joined the preparatory section of the Ecole Polytechnique, and at 17 carried off the first prize for drawing. He entered the office of M. Mallet, an architect at Douai, continuing at the same time the study of higher mathematics with M. Avignon, professor at the Ecole Polytechnique. He was nearly 20 when he left Douai for Paris, and entered the studio of M. Duban. Young Daly took notes of all that he met with in his provincial tours that appeared to him to possess architectural interest, and the influence of such studies of old work was soon apparent in his compositions, which drew forth the congratulations of Duban. Labrousse also showed him great kindness, and when, in 1839, César Daly established the "Revue générale de l'Architecture," it was Labrousse who designed the frontispiece. In 1843 M. César Daly was appointed diocesan architect of Alby, and fulfilled the duties of that office for twenty-five years, carrying out the restoration of the Cathedral of Alby. M. César Daly was the first, in 1848, to found a society for decorative or industrial artists engaged in designing for trade manufacturers, and he insisted on their admission to the societies representing the Fine Arts. In the same year he organised a meeting of architects, painters, sculptors, poets, and critics, in order to elect and send to the Constituent Assembly a representative, whose special province it would be, in all circumstances, to protect the interests of art. The assembled artists, however, could not agree, each department refusing to the others any claim to the title. Narrow-minded jealousy and deplorable ignorance rendered united action impossible, and M. Daly had to be content with recommending each section to meet independently and appoint delegates to represent the Arts. He was an original member of the Council of Architecture, founded by ministerial decree in 1848 for the purpose of examining and approving the design and construction of ecclesiastical buildings for which a grant was required from Government. Having referred to M. Daly's journeys of exploration in Mexico, Russia, Asia Minor, and Egypt, and to the many honorary distinctions he had received, the President presented him with the medal, expressing a hope that his life would still be spared for some years of useful activity.

M. DALY, who spoke in excellent English, said that he knew of no greater honour than that which he had received that evening. Many of his earliest associations were with England, and the affection he then conceived for it had never been weakened during the sixty-seven years that had passed away since he left it to become an architect in France. M. Daly referred to the present position and prospects of architecture before which, he said, a new world was opening.

Mr. J. D. CRACE read a description of the collection of architectural drawings by Palladio and others, originally obtained by the Earl of Burlington, and lent to the Institute by the Duke of Devonshire for a few days before removing them from Chiswick House to Chatsworth. A

detailed notice of the drawings appears on another page.

On the motion of the President, seconded by Mr. ALMA TADEMA, R.A., votes of thanks were passed to the Duke and to Mr. Crace.

LAND SURVEYING AND LEVELLING, AND THE TESTING, ADJUSTMENT, AND USE OF MATHEMATICAL INSTRUMENTS.

By G. W. COBHAM, P.A.S.I.,
("Crawter" and "Special" Prizeman of the Surveyors' Institution.)

(Continued from p. 793, Vol. LXII.)

TRAVERSING WITH THE CHAIN.—In the cases described in our last, the fields admitted of tie-lines being measured across them. There is, however, a large class of work where it is impossible that lines can be taken at any great distance on either side of the circumscribing chain-lines. We then have to have recourse to traversing. The straight lines present no difficulties; the matter resolves itself into the problem of finding the inclination of two lines. Figs. 9—13 illustrate various ways of doing this. In each case A B is one line and B C the other, B being the point where they intersect.

Fig. 9.—In this case a tie-line D E is taken

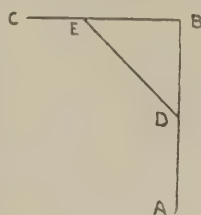


FIG. 9

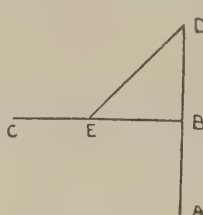


FIG. 10

between the two lines. It is used when the deviation of the direction of the new line from the direction of the old is large.

Fig. 10.—In this case the old line A B is produced to D, and a line D E measured to the new line B C. It is used when the deviation is small.

Fig. 11.—In this case both the old and new lines pass the intersecting point B, the tie-line being measured from the extra parts of the lines.

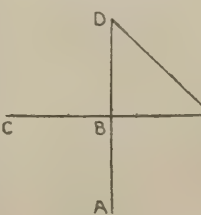


FIG. 11

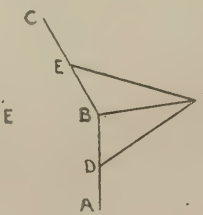


FIG. 12

It is used when the deviation is large. In each of these cases, the longer B E and B D are, the more accurate will the work be.

Fig. 12.—This is a useful form where the deviation is very small. F is a point outside the chain-lines. To plot, D B F is first laid down, then B F E and the new line B C drawn through B E.

Fig. 13 is practically the same as Fig. 12, except that the two triangles are taken on opposite

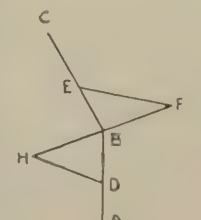


FIG. 13

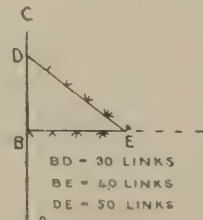


FIG. 14

sides of the chain-lines. To plot, D B H is laid down, H B is produced to F; then B F E is laid down, and B C drawn through B E. In these

two cases D B, B F, F B, B E, E F, H B, and D H should be as nearly as possible equal.

Setting out Angles with the Chain.—The most useful angle is the right angle, when the new line is required to be perpendicular with the old one.

Fig. 14.—Take B D on the chain 30 links. Hold one end of the chain at D and the 90 tab at B; the centre of the chain, when it is pulled tight, is on the perpendicular from B. Another way is to take B D 40 links, and hold the 80 tab at B; the result is the same. It is not necessary that the sides be 30, 40, and 50; but they should be in the same proportion as 6, 8, 10, or 15, 20, 25, &c.

Fig. 15.—Measure B E and B F on the chain;

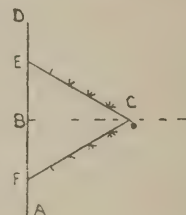


FIG. 15

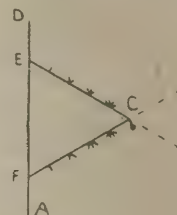


FIG. 16

they must be equal, and should be about 20 or 25 links each. Hold one handle of the chain at E and the other at F; when it is pulled tight, the centre will be on the perpendicular from B. This method is better than the last, as an error in the length of the chain will not vitiate the result, provided the two halves are alike, which can easily be tested by doubling the chain. Of course, it is not necessary to take up the chain to set out the perpendicular; a tape can be used, or even a piece of cord, having previously found the centre by doubling it. The first method must be used when the perpendicular is required at the end of the line. The only other angle that can be readily set out with the chain is one of 60° or 120°.

Fig. 16.—Take F E on the chain 50 links long; hold one handle of the chain at E and the other at F. F C makes an angle of 60°, whilst E C makes an angle of 120° with A D.

Setting out Lines parallel to existing Lines.—Fig. 17.—Set out A C and B D, making the same

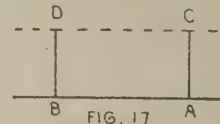


FIG. 17

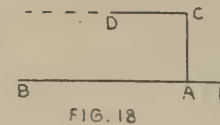


FIG. 18

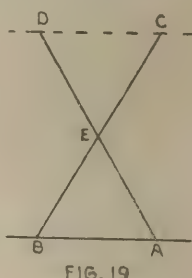


FIG. 19

angle with A B, and of equal length; a line ranged through C D will be parallel to A B. A C and B D are usually made perpendicular to A B.

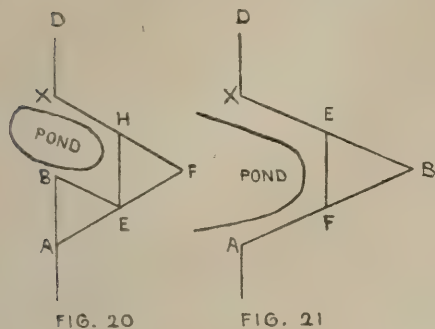
Fig. 18.—A C is set off from B E, and C D is set off from A C, the angle A C D being made equal to the angle C A E; C D is parallel to B E. The angles A C D and C A E are usually made right angles.

Fig. 19.—Take any point, E, also any two points, A and B, on the original line, produce A E to D and B E to C, making E D equal to A E and E C equal to B E; C D will be parallel to A B. It will be seen that E is just half-way between A B and C D. Of these methods that illustrated in Fig. 17 is the best. If a third line is taken, it will lessen the chance of error. Of course, in this case all three points will appear in the same line, or the work is incorrect; the mere fact of them being in the same line does not necessarily mean that the work is correct, but it would in this case be unlikely to be wrong. The method shown in Fig. 18 is unreliable unless great care is used in setting out the angles.

Obstacles.—In chaining a line it sometimes happens that we come to an obstacle which prevents us from proceeding with the line. These can be divided into two classes:—A. Those that prevent us measuring along the line, but which offer no impediment to sight, as rivers, ponds, or

quarries. B. Those that impede the sight, such as buildings or woods. Figs. 20 to 28 deal with the first class. In each case X is the inaccessible point. Figs. 29 and 30 deal with the second class.

Fig. 20.—AB, BE, and AE are made equal

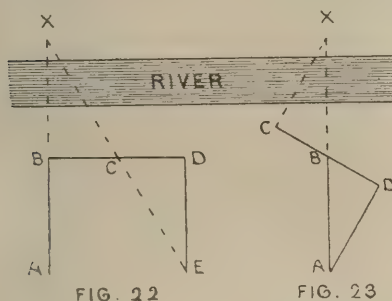


(most conveniently half a chain), AE is produced to F, and EF, EH, and FH are also made equal; mark X on AD where FH cuts it. If the work is correct HX should be equal to AE. AF and FX are equal to AX.

Fig. 21.—Take any point, B, visible from both A and X. Take F half-way from A to B, and E half way from B to X. The distance AX is double the distance FE.

In these cases it is not necessary that X should be visible from A, provided we have some means of continuing the direction of the line. It is frequently the case that the obstacle is in a valley, when the line can be ranged over it. Of course, the lines should be made to avoid obstacles as much as possible.

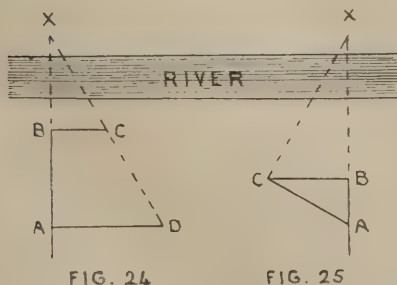
Fig. 22.—BD is set off perpendicular to AX, and its centre point O marked. DE is set off perpendicular to BD, and the point E is taken



in a line with XC. DE is equal to BX. It is not necessary that the angles DBX, BDE should be right angles; it is only necessary that they should be equal. This makes the accuracy of the method of setting out immaterial, provided it is the same in both cases.

Fig. 23.—This is the same as the last, only the lines are set out on opposite sides of the chain-line, thus saving space. Take any point C, set out the angle XCB, produce CB to D, making BD equal to CD; set out the angle BDA equal to XCB, marking A where it cuts the chain-line. AB is equal to BX. This method is perhaps the best that can be used. The lengths CB and BD can be measured with a tape; the distance AB is, of course, read from the chain.

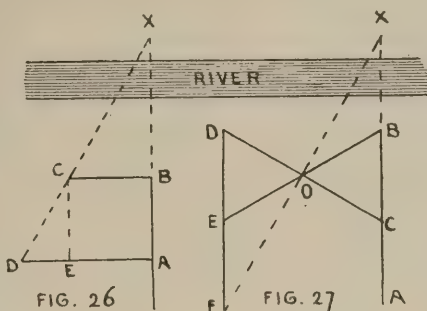
Fig. 24.—Set off BC at a known angle from



with CD, and on the chain-line; AB is equal to BX.

Fig. 25.—Set off BC at a known angle from AB. Set off CA, making the angle XCA equal to the angle ABC. Measure AB and AC. Square AC, and divide by AB, the result will be the length AB; or $AB = AC^2 / AB$.

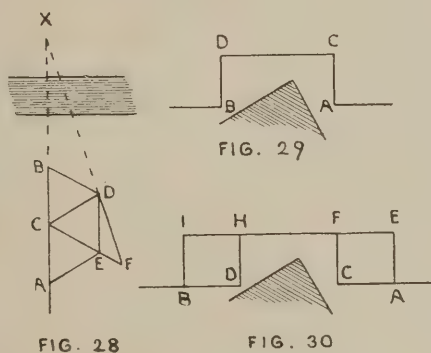
Fig. 26.—Set out AD at a known angle to



AX. Set out BC at the same angle, and put C in a line with DX, measure AB, BC, and AD. Multiply AB by BC, and divide the result by the difference between AD and BC, which will give BX; or $BX = AB \cdot BC / D E$.

Fig. 27.—Take any point O, also C and B on AX. Produce BO to E, and CO to D, making OE equal to BO and OD equal to CO, produce DE to F in a line with XO; EF is equal to BX.

Fig. 28.—Make AC, CB, AE, CE, CD, and

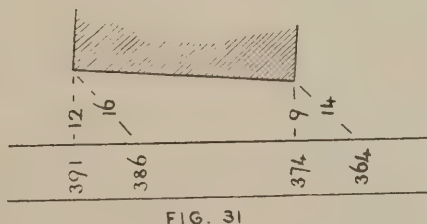


BD all equal. Produce CE to F, let F be in the line XD, measure EF. Square AC, and divide by EF; the result is BX; or $BX = AC^2 / EF$. AC, &c., may conveniently be made half a chain if BX is under two chains.

We now come to the cases where we have to find the direction of the line as well as the length.

Fig. 29.—Make AC perpendicular to the line, CD perpendicular to AC, DB perpendicular to DC and equal to AC. Then set out the line perpendicular to DB; the length AB will be equal to DC. This is a very inaccurate method, as a slight error in the instrument used to erect the perpendiculars will be magnified four times in the result, and any small error in setting out any of the perpendiculars makes the result erroneous.

Fig. 30.—This is a much more accurate way.



AE and CE are set off at a known angle with the chain line and of equal length; a line is ranged through EF and HD, and IB are set off the same angle with it that AE made with the chain line, they are also made equal in length to AE; the direction DB is the direction for the line to be ranged. The distance HF is equal to CD. AC and IH should be made as long as possible,

and AE, &c., as short as possible. Instead of setting off EF by means of AE and CF, the method shown in Fig. 19 could have been used, and the distance CD determined by any of the methods we have given.

Fig. 31.—When an important point is to be put in with a rather long off-set, the method shown in this figure should be used; it will be seen that the positions of the angles of the building are independent of the accuracy of the setting out of the off-set at the proper angle.

ERRATA.—On page 793, column 1, line 69, for C read G; 74, for C read G; 75, for C read G; 85, for ACO read AGO; 86, for ICO read IKO.

(To be continued.)

WATER-COLOUR PAINTING IN ENGLAND.*

THIS is one of the excellent series of "Illustrated Handbooks of Art," edited by Edward J. Poynter, R.A., and published by Messrs. Sampson Low and Company. Mr. Redgrave has in this volume brought into a small compass much that has been written on the subject, and has furnished the student with a comprehensive sketch of the history of the art of water-colour painting in this country. The reproductions of drawings by leading artists in the collection at South Kensington, and in the Print Room of the British Museum, add considerably to the value of the book; and the author has availed himself of the recent History of the Old Water-Colour Society by Mr. J. L. Roget, to furnish many points of interest, including the origin of the Old Water-Colour Society, which was founded by ten members in 1804. The early history of this society is told. In the first chapter Mr. Redgrave describes the different methods of painting, which he divides into three periods—1. Early period, prior to 1780. 2. Middle period, from 1780 to the establishment of the Water Colour Society in their new gallery in Pall Mall East. 3. The Later period, from the final removal of the Society to Pall Mall to the present time. This is a somewhat unscientific division to our minds, even if we admit that the old Society exercised considerable influence over the practice of its members. It would have been more exact and descriptive to have classified the periods according to technical methods and style. For example, the Dutch school of water-colour painters, from whom it is said sprang the earlier school of English painters, drew their outlines with a reed pen, adding local tints of Indian ink, sepia, brown, grey, and other colours in thin washes, and this kind of art was, with modifications, adopted by many of our early masters, as Paul Sandby, Dayes, Girtin, and Cozens. This school is properly called the topographic school, as it sprang from the love of antiquarian research and Classic landscape. The Print-room of the British Museum furnishes many examples of the Dutch and Early English school, and the student will learn much by looking over the collection at the S.K. Museum. Afterwards the pen outline gradually gave way to stronger washes of colour, and the topographic style was superseded by the truer water-colour method, of which Cozens may be ranked one of the pioneers. Full and richer colouring succeeded. Mr. Redgrave gives some instructive reproductions of landscapes in these early styles, with buildings by Dayes, T. Hearne, J. R. Cozens, T. Girtin, &c., and his remarks are interesting. This period might with propriety be distinguished as that of water-colour painting, as the earliest was merely washed or tinted drawing.

Chapter III. deals with the work of Francis Wheatley, R.A., W. Hamilton, R.A., Sawrey Gilpin, R.A., J. H. Mortimer, A.R.A., Michael Angelo Rooker, A.R.A., Samuel H. Grimm, W. Marlow, J. Cleveley, J. A. Gresse, T. Stothard, R.A., and W. Blake, brief notices of whom are given, and a characteristic work by Wheatley, "The Little Gleaners" is illustrated. Next the works of J. M. W. Turner, R.A., his early and late drawings, are noticed, and two good examples given. Chapters V. and VI. describe the formation of the Society of Painters in Water-Colours, the Royal Society of Painters, and other water-colour societies which came into existence because of the scant justice done by the Royal

* By GILBERT R. REDGRAVE. London: Sampson Low, Marston, and Company, Limited, St. Dunstan's House, Fleet-street.

AX, and set up a staff at C. Set off AD at the same angle, and double the length of BC. Measure AB. A staff, X, is then put in a line

3	ditto	ditto	ditto	0	0	6
4	ditto	ditto	ditto	0	0	6
5	ditto	ditto	ditto	0	0	7
6	ditto	ditto	ditto	0	0	9

BRONZED American ornamental cupboard catch, with screws and fixing—			£	s.	d.			
1½ in., all bronzed.....	each	0	0	11	3			
2½ in. ditto	ditto	0	1	1				
BRASS BLIND BOLTS, including screws and fixing—								
s. d.			s. d.					
2 in. No. 16 ... each	0	5½	5 in. No. 16 ... each	0	10½			
2½ ditto ... ditto	0	6	6 ditto ... ditto	0	11			
3 ditto ... ditto	0	6½	7 ditto ... ditto	1	2½			
3½ ditto ... ditto	0	7	8 ditto ... ditto	1	5			
4 ditto ... ditto	0	8½						
SHUTTER BOLTS, including screws and fixing—								
s. d.			s. d.					
6 in. japanned each	0	7	10 in. japanned each	0	9			
7 ditto ... ditto	0	7½	11 ditto ... ditto	0	10			
8 ditto ... ditto	0	8	12 ditto ... ditto	0	11			
9 ditto ... ditto	0	8½						
Add 1d. each for rings.								
SHUTTER BARS, and screws and fixing—								
s. d.			s. d.					
14 in. japanned, No. 20, with brass drop and cap	each	0	1	1				
16 ditto ditto ditto ... ditto	0	1	2					
18 ditto ditto ditto ... ditto	0	1	3					
20 ditto ditto ditto ... ditto	0	1	4					
22 ditto ditto ditto ... ditto	0	1	5					
24 ditto ditto ditto ... ditto	0	1	6					
14 in. ditto No. 41, with spring box	ditto	0	1	1½				
16 ditto ditto ditto ... ditto	0	1	2½					
18 ditto ditto ditto ... ditto	0	1	3½					
20 ditto ditto ditto ... ditto	0	1	4½					
22 ditto ditto ditto ... ditto	0	1	5½					
24 ditto ditto ditto ... ditto	0	1	7					
KING'S patent bolt and indicator for offices and water-closets, with screws and fixing each						0	4	0
ASHWELL'S patent indicator and bolt, and ditto—								
Brass, E 255			each	0	9	0		
Nickel-plated			ditto	0	11	0		
NIGHT BOLTS, with screws and fixing—								
5 in., No. 1200			each	0	3	0		
6 ditto			ditto	0	3	9		
7 ditto			ditto	0	4	6		
STRONGER ditto, No. 1201, and ditto—								
6 in., No. 1201			ditto	0	4	0		
7 ditto			ditto	0	5	0		
8 ditto			ditto	0	5	6		
SASH BOLT and ditto—								
No. 801			ditto	0	1	2		
No. 5339			ditto	0	1	0		
BRASS Espagnolette bolts, with screws and fixing—								
No. 3751, ½ in.			per foot run	0	4	3		
(Less than 5ft. is charged as 5ft.)								
½ in. ditto			ditto	0	4	9		
¾ in. ditto			ditto	0	5	4		
1 in. ditto			ditto	0	6	6		
IRON ornamental ditto—								
No. 3752, 6 ft. 6 in. long.								
9-16 in. diameter rod			each	0	5	6		
¾ in. ditto ditto			ditto	0	6	0		
¾ in. ditto ditto			ditto	0	7	0		
13-16 in. ditto ditto			ditto	0	8	8		
Extra length of bolt and fixing			per foot	0	1	0		
HART AND CO.'S Combined Bolts for casements, sashes, single or swing doors, including screws and fixing—								
6 ft. high and under with loose key or fixed handle for 3 in. stile			each	1	15	0		
6 ft. and under for 4½ in. stile, to throw top bottom and centre			ditto	2	12	0		
Ditto, but to lock out			ditto	2	17	6		
7 ft. high for 4½ in. stile, to throw with loose key or fixed handle			ditto	2	10	0		
7 ft. high, 7 in. case			ditto	3	7	6		
Two-bolt mortise lock for ditto and fixing			ditto	0	15	6		
Mortise case, external bolts of iron, and fixing			ditto	2	15	0		
Two-bolt mortise lock for ditto and fixing			ditto	0	15	6		
Top and bottom bolts with rim lock combined, for cloth-covered doors, fixed complete			ditto	3	12	6		
Ditto bright iron, with brass mountings, and ditto			ditto	4	7	6		
Ditto all brass ditto ditto and fixing, &c. ditto			ditto	5	7	6		
ADAMS' double and triple action Secure casement bolts—								
¾ in. double action, all iron			each	0	9	6		
¾ in. ditto brass ditto			ditto	0	13	0		
¾ in. brass mounts			ditto	1	5	0		
All brass ditto			ditto	1	10	0		
Triple action			ditto	1	10	0		
¾ in. all brass ditto			ditto	1	18	0		
SMITH AND STEVENS' Janus fasteners for casements, fixed, including screws—								
4 ft. long			per foot run	0	8	0		
5 ft. ditto			ditto	0	7	6		
6 ft. ditto			ditto	0	7	0		
7 ft. ditto			ditto	0	6	6		
8 ft. ditto			ditto	0	6	3		
9 ft. ditto			ditto	0	6	0		
Double levers extra			each	0	6	0		
Lock and key			ditto	0	7	6		
Draw bars and groove for long bolt to shoot into an opposite stile			per foot run	0	3	6		

CARPENTRY AND JOINERY.—XLIV.

SKIRTINGS AND PLINTHS.

ALL the skirtings that have been dealt with up to now have been those composed of a single piece; but it will be obvious that this would only suit for comparatively narrow skirtings or plinths, or else for those of slight projection; but these difficulties are easily remedied by breaking up the skirting or plinth into two or more portions, as is convenient for the working thereof. For instance, take Fig. 290. This

plinth (deep skirtings composed of two or more pieces are usually termed plinths) would require 1½ in. of timber to get it out, and of such breadth as is required, which would be rather costly in most cases; but got out by this method, a bold moulding can be taken out of 1 in. thick, or, better still, out of 1½ in., and the plain portion with the scotia on its upper edge may be taken out of ¾ in. or ¾ in., and, of course, the breadth may be

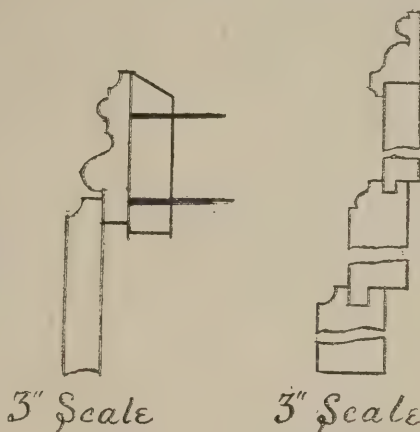


FIG. 290.

FIG. 291.

arranged to suit. It will be seen that the moulding must be fixed first, and this is usually done to a strap which has been nailed along the wall before any plastering has been done, and the grounds are put up at the same time for the other portion. The strap is, of course, continuous around the room, except where windows and doors occur. The grounds for the plinth will be upright pieces fixed about 2 ft. apart, except in cases where the distance is less than this, or where two grounds are required to fasten it properly. The moulding will be put up all round first, scribing the internal angles, and mitring the external ones. It is to be observed that the upper edge of the strap to which the moulding is nailed is bevelled; this is to form a key for the plaster. Another point to be noticed is that there is a space between the moulding and the plinth, so as to form a quirk to the moulding. There may be designs of moulding wherein this is not necessary, and of course these will be arranged for accordingly.

Fig. 291 provides for two contingencies which may arise—viz., ¾ in. or ¾ in. may be too light for the plinth, and so the moulding may have a tongue or feather provided upon it, so as to enter a groove in the plinth, allowing for the plinth at least an inch in thickness, which will be heavy enough for most ordinary situations, and in addition it is seen that where the plinth would be so broad as to be unsightly, its breadth may be broken up by introducing the scotia shown in the bottom part of the figure. In this case the moulding will not be put on first, but last. Of course a strap will be required for the moulding; but the other portion, on account of its extra thickness, would only require grounds, say, 2 ft., 6 in. or 3 ft. apart. This plinth will be scribed and mitred as described for the previous one.

If any difficulty should present itself at some of the angles owing to the scribing being troublesome to get entered, a little might be taken off the tongue at the end which is to be first inserted, and if a length should occur too short to admit even of this, the simpler way would be to mitre it, and then it could be driven straight down.

Fig. 292 is evolved out of, or suggested by, Fig. 291, to avoid using such thick timber.

The grounds will be put up to suit, and the bottom piece of the plinth will be put up first. The bottom edge of the under-piece may be arranged so as to be put into a groove in the floor. This would require that it be rebated similarly to the edge of the piece above it.

The track or groove for the tongue left thus upon the under edge of the bottom portion of the plinth is made in the floor with a dado or trenching plane, a lath being nailed along the floor at the proper distance from the wall for that purpose. This lath requires to be planed straight on the working edge, seeing that the side of the plane is moving along it.

Of course, the proper distance from the wall will be best obtained from the sectional elevation, which should be got out in every case in order to prepare the various parts. A plinth such as this would be put up after the plastering is completed, and then the plumb-line of the plastering carried down to the floor would give the point to take the projection from. The plastering is stopped upon the strap to which the base-moulding is nailed, as shown in Fig. 290, and if the plinth is a deep one there will be no fear of the hands coming in contact with the plaster during the working of the groove in the floor. When corners interfere with the readily doing the work with the dado-plane, then the joiner must have recourse to chisels, large and small, or extemporised tools, so as to reach into these corners where the grooves join at right angles, and in most cases it will be found necessary to begin at the extreme end with the chisels in order to allow the dado-plane to work down.

Fig. 293 gives a case of skirting in four pieces; the method of its construction is easily seen from the drawing. Instead of grooving the floor, a heavy under-base is spiked to the floor. The spiking to the floor may be done where the groove for the portion above it occurs, so that the nailing may be concealed. No further preparation requires to be made for this, seeing that wherever joists occur a longer nail may be put in so as to reach into the joist. A strap would

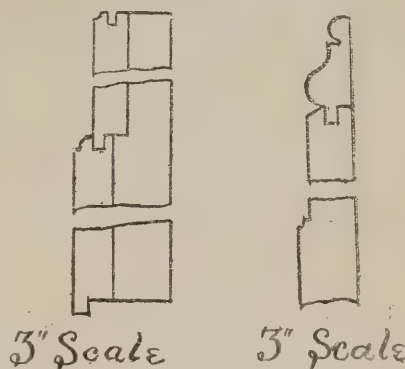


FIG. 292.

FIG. 293.

be put along for the moulding, and grounds for the remaining portions of the skirting. It should not be necessary to state that these grounds should be put up previous to any plastering, nor should it be required to enter into further details, as the drawing is self-explanatory.

It needs only to be mentioned that such a skirting as that could be made of any depth required, as all the members could be extended in proportion.

Figs. 290 to 293 will serve as types of skirtings from which others may be modelled. It will be readily seen that some of them will do without base-blocks; but some of them must have them, and in the case of Fig. 293 it would be well if the base-block followed the outline of the skirting—at least, to some extent. But in what follows this will be entered into.

However, it may be stated that, if necessary, and with such a skirting as Fig. 293, if polishing or varnishing is intended, a good effect may be obtained by various coloured woods, the number of parts into which it is divided lending itself readily to this method of treatment. In Figs. 266 and 267, which occur in the 39th article of this series, there was given a plan and elevation of the base-block of an architrave which formed part of the finishing of a room where the skirting now to be illustrated was used.

Fig. 294 shows the upper portion of the Plinth and base moulding; there is nothing about this except that the moulding may be considered to be a very effective one on account of its outline. The entire trimmings of the dwelling to which this belongs were unique in character. As was then stated (Figs. 266 and 267) teak and pitch-pine were the timbers used, so also in the skirting the mouldings were teak, and the plain portions were pitch-pine, thus forming an excellent contrast.

Fig. 295 gives the remaining portion of the elevation of this plinth in order to have the idea of the whole. This section of the elevation is what occurs at the junction of the upper and lower plinths, showing the ogee moulding, which

breaks the continuity of the outline, and corresponds with a smaller moulding in other skirtings which have been described, but in which the mouldings formed part of the bottom plinth, and differed from this in that it was worked on the



3" Scale

FIG. 294.

solid. The drawing (Figs. 294 and 295) is self-explanatory, and the method of construction does not need to be fully dwelt upon.

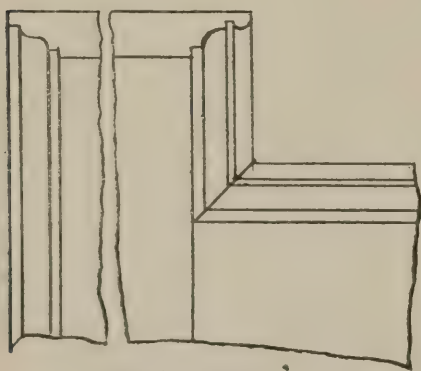
The total height of this skirting was 13½ in. The point to be noticed is that the ogee shown in Fig. 295 was continued round the base block, as will be seen by referring to Fig. 267, and comparing the two drawings. Also by comparison of these drawings it will be noted that the scotia under the base moulding occurs on the same horizontal line as the scotia at the top of the base block, and immediately under the return architrave



3" Scale

FIG. 295.

moulding; however the skirting moulding is not scribed into the scotia of the base block, but simply abuts against the capping of the architrave. In regard to the fixing of this skirting, it will be readily seen that the base moulding must be put around the room first; this will be done just as described in other cases which have preceded, then from the construction it is seen that the upper plinth is next fixed, then the bottom, and, last of all, the ogee moulding. Let it be carefully noted that the space left for the ogee moulding must be very



3" Scale

FIG. 296.

exact, seeing that it fits into the groove in the lower plinth, and the rebate formed for its reception in the bottom part of the upper plinth. There should be a good joint along the upper edge of the ogee moulding. If the upper edge of the ogee is bevelled slightly to the inside, and the tongue of its bottom edge left slack, there will

be no difficulty in getting this moulding into its place.

When, as in this case, the skirting is to be polished or varnished, it is desirable that the fixing should be done with needle points, so as to make the smallest holes possible to be stopped in the process of decorating. Most varieties of skirting have been dealt with now. Fig. 260 gave an illustration of an architrave in which the moulding of its outer edge is the same as that which occurs on the skirting, and hence the moulding of both intersects, seeing that architrave and skirting are in the same plane, and so as to show the continuation of the moulding, along the skirting, up the architrave, along the architrave head, down the architrave of the other side, and on round the skirting, and wherever it is possible to continue this moulding it is continued.

Fig. 296 gives a section and elevation of skirting and architrave to show the arrangement of mitring where the skirting and architrave intersect. It hardly seems necessary to state that if richness, ornateness, or variety is required in the skirting, it may be obtained by introducing various coloured timbers, either to contrast, match, or anything else that may be needed.

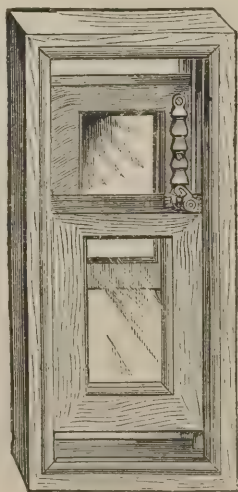
Sufficient has now been said upon this subject. The workman will be able to adopt from the specimens illustrated what will suit anything which may be called for. In concluding this article the reader should know that for the deeper kinds of skirting framed grounds are sometimes used. These are formed of parallel rails and cross-pieces, occurring at intervals of from 2ft. to 3ft., mortised and tenoned together. They might be spoken of as skeleton framing, and it is usually 1 in. or 1½ in. thick.

This is only done where the work is of a superior class.

A. C. SKILLING.

ROGERS'S PATENT SELF-ACTING AND VENTILATING SASH FASTENER.

THIS fastener, as will be seen by the sketch, consists of a metal toothed rack, affixed to



the upper sash, with which the detent or cam-catch on the lower sash engages at any height or degree of aperture desired, both of upper and lower sashes. The arrangement firmly holds the sashes safe and stable in any position required for ventilation, and cannot be opened from the outside.

BOOKS RECEIVED.

Archæologia Oxoniensis, Part I. (Oxford: High-street; London: Henry Frowde, Amen-corner).—"Prehistoric Oxford," by C. W. C. OMAN, is the first article in this new work on the antiquities of Oxford, in which the author gives an interesting account of the various "finds," and challenges the opinion that there is no evidence of British occupation on the site of the city, or that any settlement of importance existed. Attention is drawn to late discoveries in North Oxford, where British interments have been found. Roman coins, gold rings, pottery, and other remains are to be seen in the

Ashmolean Museum, proving the existence of British and Roman-British occupation long before the Saxon era. The author gives a map of the finds, including many remarkable interment remains, as those of the Roman vase from Mansfield College foundations, and a large fluted ovoid pot found in New Inn Hall-street. The New Schools discoveries, or pit dwellings, on the site of those buildings in the High-street, is the subject of another paper. A third paper of interest is contributed by Mr. J. P. Harrison on "The Pre-Norman Clerestory Window and other Early Work Discovered in Christchurch Cathedral."—*Linear Perspective*, by HENRY HODGE, B.A. (London: William Collins, Sons, and Company) is designed to meet the requirements of students preparing for the second grade examination of the Science and Art Department, and from a general glance at the principles and treatment of the book, and the problems given and illustrated, we should say that Mr. Hodge's book is well adapted for the purpose intended. The diagrams and solutions are clear and concisely stated. The method of obtaining perspective from a ground plan would have been a useful addition to the architectural student, and we confess the methods and examples savour a little too much of the Department and its system. The examples of buildings might have been improved, and show a little more architectural propriety; while many of the problems set by the S. and A. Department, such as cylinders piled on prisms, cones piercing parallelepipeds, and other unusual combinations of objects, would have been better replaced by forms of objects and features of buildings which are more frequently required in architectural drawings and landscape. The book is well printed, and is published at the very reasonable price of 2s.

CHIPS.

Lord Rayleigh, Lord Lieutenant of Essex, opened on Wednesday new Grammar School buildings which have been built at Chelmsford, from designs by Mr. Henry A. Cheers, of Twickenham.

The annual conversazione of the Society of Arts took place on Wednesday evening at South Kensington Museum, and was largely attended. In the absence of the Attorney-General, the chairman of the Society, the guests were received by Sir Philip Cunliffe Owen and the members of the council. The whole of the courts and corridors of the ground-floor were opened, together with the galleries containing the Raphael cartoons, the Sheepshanks collection, the William Smith collection of water-colour drawings, the Dyce and Forster pictures, and the Chantrey Bequest.

Mr. Thomas Kidd has been appointed city engineer and sanitary inspector of Ripon.

The will of Mr. Lumb Stocks, R.A., line engraver, has been proved, the personality amounting to £37,000.

A fatal accident took place on Monday at Fettykil paper works, near Leslie, Fife. A single-span bridge is being constructed over the river Leven, on which part of the warehouse will stand, and this 12ft. span, which was finished last week, collapsed while the centre piece and scaffolding were being taken down. The river was running very high and strong, and five men were crushed to death or drowned, viz., Mr. William Gould, the manager of the mill, under whose supervision the work had been carried out; Robertson and Paul, workmen, and Galloway and Brunton, labourers.

Mr. Arnold Taylor conducted a Local Government inquiry at the Town-hall, Lancaster, on the 27th June, in respect of the application of the town council for power to borrow £42,590 for street improvements, new roads, fire brigade, market, baths, and other purposes, £15,000 for works of water supply, and £2,600 for extension of the municipal buildings.

In order to arrange a division of the businesses carried on under the styles of Rowson, Drew, and Co., and George Wright and Sons, the partnership existing between Mr. Thomas Drew, his son (Mr. Lewis Harry Drew), and his nephew (Mr. T. Drew Bear) was dissolved by mutual consent on the 30th ult. Mr. Drew and his son retain the bar iron, steel, hardware, and stove and range businesses, and will carry them on in the names of Rowson, Drew, and Co. and George Wright and Sons as heretofore, and will receive and pay all debts due to, and owing by, these firms. Mr. T. Drew Bear takes over the engineering department, which has always been under his management. Mr. Drew Bear has taken into partnership Mr. Frank Ransome, of Ipswich, and Mr. E. Hollis Perks, and the business will be carried on in the name of Drew Bear, Ransome, and Perks, at 71, Queen Victoria-street, E.C., and at the Works, Prince's Wharf, Lambeth, as before.

CONTENTS.

The Clerk of Works and His Duties	1
Architectural Examination Programmes	2
Rainfall: its Discharge and Storage	3
Royal Institute of British Architects	3
Land Surveying and Levelling, and the Testing, Adjustment, and Use of Mathematical Instruments	4
Water-Colour Painting in England	5
Prices.—XXXIX.	6
Carpentry and Joinery.—XLIV.	7
Rogers's Patent Self-Acting and Ventilating Sash-Fastener	8
Books Received	8
The Building News Directory	XIII
Our Illustrations	9
Thirty Thousand Volumes	9
Ground-keeper's Lodge, Carbrook	10
Autograph Architectural Drawings of the English Renaissance	10
Hygienic Congress at Portsmouth	10
Wayside Notes	28
The Society of Architects' Visit to France	28
Obituary	28
Filtering Water.—II.	29
Masonry Retaining Walls	29
Building Intelligence	30
Engineering Notes	30
Architectural and Archaeological Societies	31
Archaeological	31
Competitions	31
Correspondence	31
Parliamentary Notes	32
Water Supply and Sanitary Matters	32
Intercommunication	32
Legal	33
Legal Intelligence	33
Our Office Table	34
Trade News	34
Meetings for the Ensuing Week	34
Tenders	34

ILLUSTRATIONS.

WANDSWORTH POLICE-COURT.—"GLENROY," FINCHLEY.—ALL SAINTS CHURCH, PENARTH.—INTERIORS OF MANSION AT PRINCE'S-GATE.—SCULPTURE AT THE ROYAL ACADEMY.—REFRESHMENT PAVILION AND GROUND-KEEPER'S LODGE, SHEFFIELD.

Our Illustrations.

WANDSWORTH POLICE-COURT.

THIS important police-court is to be used for the first time to-day, and to be known as the South-Western Court. The plan which we give, with the front elevation, among our accompanying plates, clearly shows the commodious arrangement of the court, with its waiting-rooms, various entrances, the offices, and also the necessary cells for prisoners of both sexes. Mr. J. Taylor, F.R.I.B.A., of H.M. Office of Works, is the architect. Messrs. Mowlem and Co., of Grosvenor Wharf, S.W., were the builders. The building has been erected on Lavender-hill, Clapham Junction. The principal front and return façade are of red brick, with Portland stone ground story and dressings, as well as the pediment over the main entrance. The cost of the work, including warming and lighting, has been about £14,000. Mr. W. Dyer was the clerk of the works.

"GLENROY," ETCHINGHAM PARK, FINCHLEY, N. The whole of the exterior brickwork to the ground-floor story has been built in red brick of a light colour; the first floor is rough-cast plastering, and the gables have been executed in half-timber work. The roof is covered with Broseley tiles of a stronger colour than the bricks. The builder is Mr. F. Voller, of Wood Green, N., and the architect is Mr. E. W. Poley, A.R.I.B.A., of 22, Surrey-street, Strand, W.C.

ALL SAINTS CHURCH, PENARTH, GLAMORGAN.

THIS church was built last year to take the place of a temporary iron structure which for many years has been the only church on the residential side of the town. The site for the present building, which is in the middle of a public garden of three acres, was given by Lord Windsor, who owns the ground on which Penarth stands, and who also generously contributed half the cost of the building. The church, which seats 600, is lofty in proportion internally, with arcades of five bays on each side of the nave, the columns and arches increasing in richness towards the east. The roof, which is continuous throughout the nave and chancel, is barrel-shaped, and in the chancel is decorated in colour. The walling externally is faced with Pennant stone in thin courses; the quoins and dressings internally and externally are Bath stone; the roofs are covered with Whitland Abbey slates.

The carving is by Mr. W. Clarke, of Llandaff. Mr. L. Purnell, of Cardiff, was the contractor, the contract price being £6,000. Messrs. J. P. Seddon and Carter are the architects. The drawings here reproduced are in the present Royal Academy Exhibition.

NO. XLIX. PRINCE'S GATE, KENSINGTON.

THESE photographs were taken in the drawing-rooms of this mansion, the residence of the late Mr. F. R. Leyland, the Liverpool merchant, before the house was dismantled for the recent great sale of Pre-Raphaelite and Early Italian pictures. The furniture and works of art are also shown in the views just as they were left by the owner. The celebrated "Peacock room," as the dining-room is called, was fitted up from designs by the late Mr. Jeykell, whose taste for Japanese design made him a name in connection with the adaptation of that style so fashionable a few years ago. After him Mr. James McNeil Whistler was employed to elaborate the room which he covered entirely with gold, patterned out in the squares of the leaf after a random manner, smearing the surface with blues and greens blended together as if by mere chance, thus obtaining an indefinite erudescence effect of gilding, clouded like aventurine, while the panels and framings of the doors, shutters, and cases of shelving are enhanced by imbrications of peacock's feathers and other devices. We thought the effect, at any rate, curious, and can well understand Jekyll's rage at the fine old Spanish leather, with which he hung the walls, and for which Mr. Leyland paid over £1,000, being thus covered with gilding to destroy the red flowers with which the leather was powdered, only to make it harmonise with the turquoise blue painting by Whistler of "La Princesse du Pays de Porcelaine," hung at the end of the room. The stone staircase in the hall of the house, with its balustrade of gilt bronze, came from Northumberland House at Charing Cross, and is of 18th-century date. Upstairs, and in the morning-room below, Mr. R. Norman Shaw, R.A., was employed. The three drawing-rooms or salons on the first floor communicate with each other, and between them Mr. Shaw contrived two costly screens made with folding gates, as seen in the upper view on the accompanying plate, with shaped pediments over the centres. The woodwork is executed in walnut, but the arcaded filling in the upper parts of the gates has posts of burnished brass with Ionic caps and scrolls between them. This work is said to have been suggested to Mr. Norman Shaw by the roof-loft screen from the Cathedral of Bar-le-Duc, now in the South Kensington Museum. These screens can be taken down and removed entirely when it is desired to throw the three rooms into one, as on the occasion of grand receptions. The lower view shows the west salon, which has a choice antique marble chimney-piece in it from Italy. Over this Mr. Shaw has designed a walnut arcade for the display of works of art. On either side of the fireplace hang two of Sandro Botticelli's famous paintings illustrating the story of "Nastagio degli Onesti" in the "Decameron" of Boccaccio, and which came from the collection of the Pucci family. The doors and woodwork of these apartments are by Mr. Shaw. All the ceilings are alike with walnut framings inclosing caissons of gilt arabesque design. The gas lantern pendants remind us of some in the Chinese rooms of the Pavilion at Brighton, filled as they are with ground glass. Electric light has been introduced above these at the springing of the fan vaulting. Both gas and electric light are governed by switches outside the rooms. The agents who have the property in hand are Messrs. Osborn and Mercer, of Albemarle-street, W.

SCULPTURE AT THE ROYAL ACADEMY.

THIS sheet illustrates some of the best works in the sculpture gallery at Burlington House this year. We have already published a photograph of the Shelley memorial for Oxford. Taking the present subjects in the order in which they occur on our plate, we have nothing but praise for Mr. Henry C. Fehr's "Favourites," which we spoke of favourably in our general notice of the sculpture at the Royal Academy some few weeks ago. The bright and graceful statuette called "Morning" next to it is by the same skillful hand. "Fate-led," by Mr. Albert Toft, occupies one of the places of honour in the lecture theatre as a dignified and pure figure entirely sculptural in treatment. Mr. Onslow Ford's bust of

the Right Hon. A. J. Balfour, M.P., the distinguished Leader of the House of Commons, is a fine likeness which at once commands recognition. The Gordon Memorial shield, likewise by Mr. Onslow Ford, A.R.A., is a chaste and exquisite work in silver very delicately detailed. The bust of "A Woman" in green bronze by Sig. Andrea C. Lucchesi is worthy of its title, emblematic of all that this simple name implies.

REFRESHMENT PAVILION AND PARK-KEEPER'S LODGE, ENDCLIFFE, SHEFFIELD.

THIS building, recently completed, occupies a site near the principal entrance to the Endcliffe Woods, one of the most beautiful public parks of Sheffield. It contains a refreshment-room, 26ft. long by 16ft. wide, with alcoves projecting from either end. An attendant's room adjoins, with kitchen, store-rooms, and cellars conveniently arranged. A park-keeper's lodge forms part of the building, but is self-contained, and comprises parlour, kitchen, and offices, with three bedrooms on first-floor. Public conveniences are provided for ladies and gentlemen, with distinct approaches. The interior of the refreshment-room is finished with a salt-glazed brick dado, having moulded plinth and capping courses, the upper part of walls being in red brick. The ceiling is in wood, with moulded ribs dividing it into panels, the upper part of the room being lighted by dormer windows. The fireplace has an open hearth and wrought-iron dog-grate, and is worked in blue Yorkshire stone. The floor is laid with marble mosaic of warm tone, which gives a cheerful effect to the interior. Externally the materials used are red-pressed bricks and stone dressings, the roofs being covered with red tiles. The deep verandah is a prominent feature, and gives light and shade to the design, and is of practical service as a shelter for the public. The whole of the works have been carried out by Messrs. Ash, Son, and Biggin, of Sheffield, at a cost of about £1,400, from the designs, and under the superintendence of the borough surveyor, Mr. Charles F. Wike, Mem.-Inst. C.E.

THIRTY THOUSAND VOLUMES.

MR. J. PASSMORE EDWARDS has recently promoted the Free Library movement by presenting to various libraries and institutions in operation, and others in the course of formation, 30,000 volumes of popular standard works. The number includes 1,000 to the Village Library Association of Yorkshire, 1,000 volumes to the Southampton Free Library, 1,000 volumes to Clubs and Libraries in Salisbury, 1,000 volumes to the Cobden Club and Institute, Kensal-road; 4,000 volumes to Town and Village Libraries and Convalescent Home in Cornwall, 1,000 volumes to the Bethnal-green Free Library, 1,000 volumes to the Victoria Hall, Waterloo-road; 1,000 volumes to the People's Palace, Mile End-road; 3,000 volumes to various hospitals, schools, and evening classes in London; also 3,500 to various workmen's, boys', and girls' clubs in London; 500 volumes to the Mortimer-street Free Library, 500 to the Marylebone Free Library, 500 to the Paddington Free Library, 500 to the Working Lads' Institute, Whitechapel, 500 to the Chiswick Library and Mission Hall, 1,000 to the Whitechapel Free Library, 1,000 to the Poplar Free Library, 1,000 to the Shoreditch Free Library, 1,000 to the Chelsea Polytechnic, 1,000 volumes each to the three Polytechnic Institutions for South London, and 1,000 to school children in East and West London.

CHIPS.

Mr. Arthur W. Smith, of Radcliffe, has been appointed surveyor to the local board of Ramsbottom, Lancs.

The Bishop of Chester consecrated on Saturday the church of St. Wenefrede, Bickley, near Malpas. The Marquis of Cholmondeley gave the site, and has erected the church, which is seated for 250 persons, at his own expense.

The name of Mr. Charles Parsons, architect and valuer, has been placed on the commission of the peace for the borough of Burnley, and that of Mr. William Huntington, timber merchant, of Ashford House, Scotford, on the commission for Lancaster.

Mr. Thomas Hutton, joiner, an old tradesman of Durham, who has sat for many years in the Durham city council as a member for the south ward, died suddenly on Saturday night at his residence, New Elvet, Durham. Deceased was 67 years of age.

GROUND KEEPER'S LODGE RECREATION-GROUND. CARBROOK · SHEFFIELD.

CHAS. F. WIKE C.E. ARCHT.

BOROUGH-SURVEYOR · SHEFFIELD.



PLAN



GROUND-KEEPER'S LODGE, CARBROOK.

A PIECE of land at Carbrook, about $4\frac{1}{2}$ acres in extent, to the north-east of Sheffield, has been laid out as a recreation-ground, having gymnastic apparatus, swings, &c. The lodge has a parlour, living-room, and kitchen on ground-floor, with yard and offices and cellars in basement on first-floor; there are three bedrooms. The walls are of red brick, the windows being in wood, with moulded bars, &c.; roofs covered with slate, with tile ridges. Mr. J. Martin, of Sheffield, carried out the work at a cost of £430. Mr. Charles F. Wike, M.I.C.E., borough surveyor, Sheffield, prepared the design and superintended the building.

AUTOGRAPH ARCHITECTURAL DRAWINGS OF THE ENGLISH RENAISSANCE.

THE collection of architectural drawings by Palladio and Inigo Jones, now on view at the Royal Institute of British Architects, in Conduit-street, W., are unquestionably of considerable interest. They formed part of the series originally obtained by the celebrated Earl of Burlington, and are now owned by the Duke of Devonshire. For many years these drawings have been kept at Chiswick House; but as that historic villa is now being converted into a private asylum for Dr. Tuke's patients, the collection will ultimately be forwarded to Chatsworth. The drawings, of course, as specimens of draughtsmanship, compared with the productions of architects nowadays, are rough and out of perspective; but they are undoubtedly marked by an artistic handling of the pen, and force of intention on the part of the designer, who not infrequently, however, permitted his fancy to run riot in the exuberance of his detail and love of the picturesque. We reproduced some of these same drawings in the BUILDING NEWS for Jan. 30, 1885, when they were

shown in connection with the Exhibition of Architectural Drawings held then in the galleries of the Institute on the occasion of Mr. Maurice B. Adams's lecture on this subject. Kent helped Lord Burlington in the production of the volume of Inigo's Jones's drawings, which was published early last century. For this work all the originals were, however, redrawn, and much of their character was consequently lost. The most interesting studies to the architect now on view are those of sundry chimneypiece designs for several houses in different parts of the country. Some of the drawings are of old foreign buildings in Denmark and Italy, indicating proposed restorations and the like. By far the greater number of the sketches shown, however, are for stage-play scenery, and for actors' dresses, which Inigo Jones had to arrange as Master of the Court revels, and in this capacity he contrived many curious and wild conceits for stage displays, showing a brilliant imagination no doubt, but hardly worthy of his greater powers as a serious architect. Living under so flippant a master as James I., Jones often had much to discourage him; but his drawings as here seen were made chiefly, no doubt, when he enjoyed the smile of Royal favour, and endeavoured to realise the extravagant ideas of the court in which he was engaged after his second journey to Italy.

HYGIENIC CONGRESS AT PORTSMOUTH.

THE thirteenth congress of the Sanitary Institute will be held at Portsmouth from the 12th to the 17th September next. As in former years, the congress will be divided into three sections, each commencing on a different day. On Monday, Sept. 12, the proceedings will be opened with a reception by the mayor, to be followed by the inaugural address by the President, Sir Chas. A. Cameron; and in the evening an exhibition will be opened by the mayor in the

drill-hall. On Tuesday, the 13th, there will be five conferences—of municipal and county engineers, presided over by Mr. H. Percy Boulnois; of medical officers of health, and of naval and military hygienists, who may be expected to muster in force at such a centre as Portsmouth; of inspectors of nuisances, and one of ladies on domestic hygiene, the latter to be presided over by the mayoress. On the Wednesday, the 14th, Section I., "Sanitary Science and Preventive Medicine," will meet; and on Thursday, the 15th, Section II., "Engineering and Architecture," will be opened by an address by the President, Mr. James Lemon, M.Inst.C.E., F.R.I.B.A., the Mayor of Southampton. On Friday, Section III., "Chemistry, Meteorology, and Geology," will meet, Dr. W. J. Russell being the President; and in the evening an address to the working classes will be given by Dr. W. H. Corfield. Among the vice-presidents of the congress is Mr. A. Waterhouse, R.A., and the council include such well-known architects as Messrs. Arthur Cates, T. W. Cutler, H. Saxon Snell, and Ernest Turner.

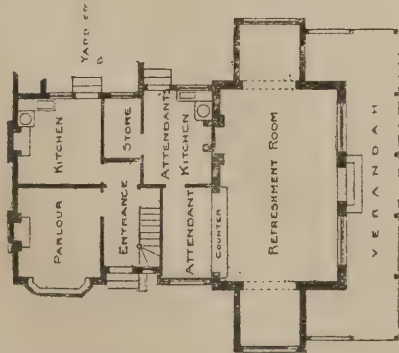
A blue limestone cross of Early Celtic type has this week been placed over the grave of the Rev. George Taaffe at Collon, Co. Louth. The cross has a total height of 16ft.; the base is covered with interlaced ornament, the shaft is divided into panels, and the bosses on the arms bear the shamrock leaf. Mr. J. Gibney, of Drogheda, was the sculptor.

The corner-stone of a new Roman Catholic school in connection with the Church of the Immaculate Conception, Penzance, was laid on Tuesday week. The building will consist of a single story, and will accommodate 100 children. The whole will be built of Castle-an-Dinas stone, with granite dressings. The architect is Mr. Oliver Caldwell, F.R.I.B.A., and the building contracts have been taken by Messrs. W. H. Trounson (carpenter) and Alfred Trythall (mason). The cost will be £1,000.

REFRESHMENT PAVILION AND LODGE: ENDCLIFFE WOODS, SHEFFIELD.

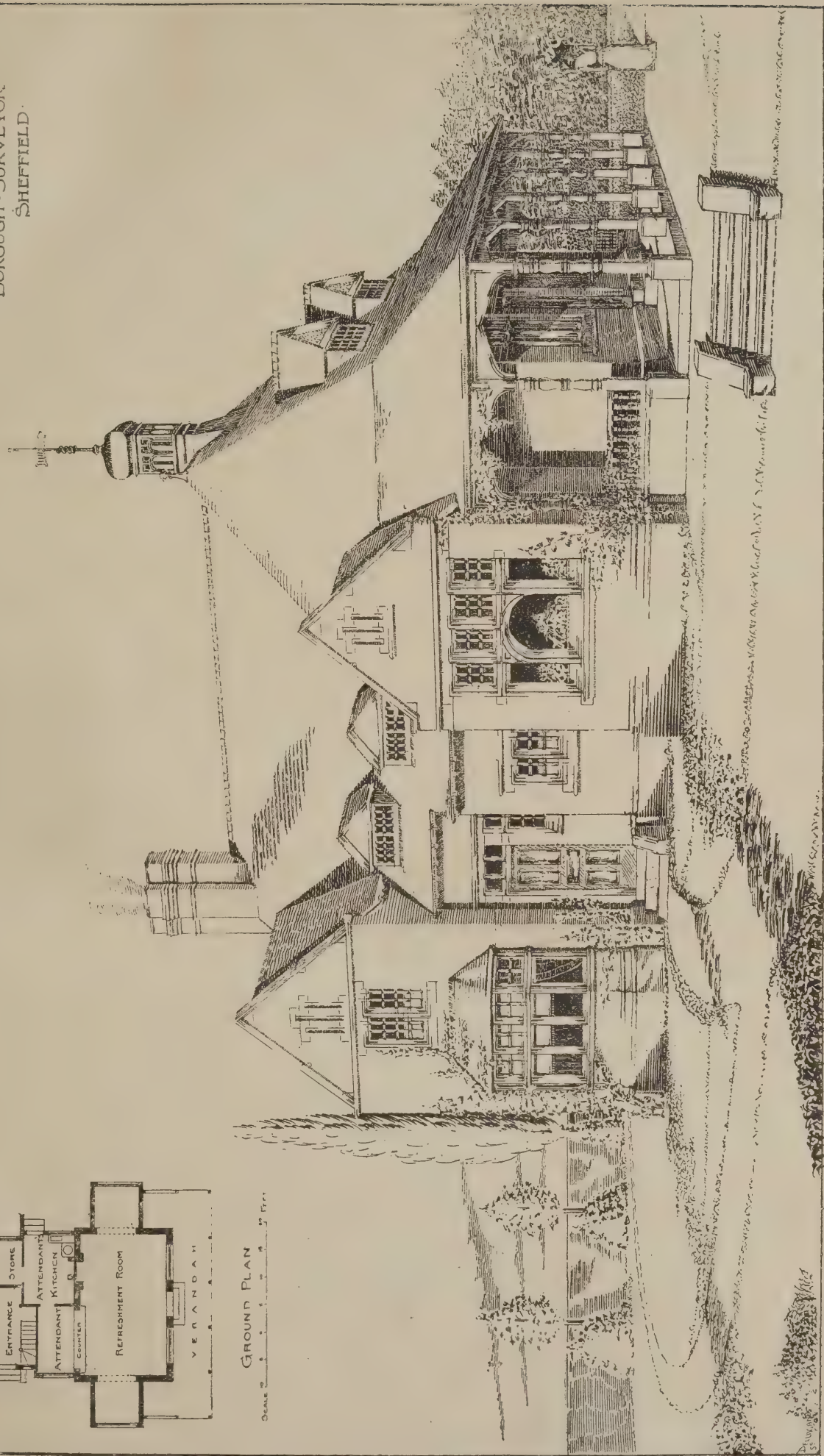
CHAS. F. WIKE, C.E.

BOROUGH SURVEYOR,
SHEFFIELD.



GROUND PLAN

SCALE 2 3 4 5 6 7 8 9 10 FEET



WAYSIDE NOTES.

HAVING thus far survived all "perils of the seas, perils of rivers, perils of navigation," I am in a position to continue my remarks upon the course of my pilgrimage round England, for by the time—all going well—that I return by way of the East Coast I shall have circumnavigated the country, the length and breadth of my wanderings in Scotland alone excepted. Scarcely had I consigned my last communication to the postal authorities at Waterford, than I repented me of the statement as to the lack of the interesting in that particular corner of Ould Ireland. There remaining some couple of hours or so before our good ship left for Glasgow, I essayed to climb the hills across the water and over against the town. Therefrom appeared a most beautiful view of rolling green countryside, with a bold sweep of the river Suir, while in the background appeared mountain-tops of that strangely beautiful blue peculiar to Ireland. So, at least, I was given to understand—and so, in truth, I discovered; the humidity of the climate apparently giving atmospheric effects quite unique. Certain it is that though for some days I have beheld Scotch mountains afar off and near at hand, and have clambered up 2,745ft. to the summit of Ben Ledi, into and above cloudland, I have seen no such beautiful blue as seemingly pertains to distant mountains in the South of Ireland. I see a distant height over the brow of some hills, out of the window, as I write, but it is as a cold grey, wholly unlike the blue to which I have referred.

It was pleasant steaming northwards, with the Irish coast on the west of us. The Wicklow mountains are most picturesquely disposed, and look wild and forbidding in the distance, across an Atlantic-grey sea, the clouds hanging about their summits, and curling over into the valleys. Speedy as is the *Pladda*, whilst steaming round the coast of Wicklow at some miles from the shore, it seems to take a long while to completely change the scene we behold across the waters. So it happened that, returning from the tea-table, we were still, apparently, opposite the Wicklow Mountains, though the evening had advanced and the sun was setting behind their broken, purple outlines, to the south, lost in masses of grey storm-clouds, and to the north relieved with a glowing crimson background.

I immensely regret that at Greenock, instead of waiting the few hours the steamer had to stay, I followed the general rush for a train to Glasgow. Thus I have missed a review of the shipping industry, and left unseen the mighty new vessels that I am told the Cunard Company are building on the Clyde with the object of cutting down the voyage across the Atlantic to some five days or so, and "licking creation." Two big steel ships are on the stocks at Greenock, and a noisy, busy scene it is—one continuous roar and crash of riveting. By good fortune I beheld the P. and O. Company's new *Himalaya* lying alongside the wharf, and she is a very fine vessel. By the bye, going down Channel we passed a large liner at night, every porthole glowing with the electric light. The ship's coloured lights, the masthead light, and diverse brilliant lamps elsewhere on the vessel made up a something fairy-like, more easily to be imagined than described. The electric light on board ship is a grand thing, as I found by experience on the *Pladda*. It is convenient to be able to put out one's hand whilst lying in a berth and switch on the light.

The Glasgow Municipal Buildings received early attention. It is a magnificent building, creditable to all concerned. The marble staircase is very beautiful. Perchance the stone here and there employed does not harmonise with the other materials. Where so much marble is used one looks for a complete exclusion of all other materials. Anyhow, the conception is very fine, and the execution irreproachable. So, too, the suite of reception-rooms are as fine as anything hitherto attempted in the way of municipal architecture. I like the general aspect of Mr. William Young's exterior.

I saw no works of restoration in progress at Glasgow Cathedral. Here, at Dunblane, much has been done, and one of the choir aisles is now being roofed. This is a very magnificent building. The west front is fine, and the little leaf-shaped west gable window deserves all that has been said about it. Mr. Ruskin was, I

believe much taken with its beauty. I have never seen such a mass of mouldings as that round the archivolts of the west door. It is in six orders, and, without counting small secondary mouldings, there seems to be some fifty hollows and projections.

I have well "done" Loch Lomond, the Trossachs, and Lochs Katrine and Vennachar. After one more run in the Highlands, I hope to see "Auld Reekie," and then home. I do not, however, intend to miss seeing the Forth Bridge, which yet attracts great attention, and "draws crowds." It has struck me that the promoters of the bridge did well in making it a wonderful construction; the mere work itself creating a traffic in sight-seers over and above regular business. GOTH.

THE SOCIETY OF ARCHITECTS' VISIT TO FRANCE.

THE Society of Architects will follow up its interesting and successful excursion to Belgium last year by a visit to France this, starting on Friday, August 19th. Train leaves London (Waterloo Station) at 9.45 p.m. Boat leaves Southampton at 12.0 midnight.

The following is the programme, subject to revision:—

SATURDAY, Aug. 20.—8.30 a.m., breakfast at Grand Hotel de Normandie, 166, Rue de Paris, Havre. 10.30 a.m., visit Hotel de Ville. 12.23 p.m., leave Havre for Rouen. 2.3 p.m., arrive at Rouen. 2.30 p.m., lunch at Grand Hotel de France, Rue des Canes, Rouen. 4.0 p.m., visit Cathedral (12-16 cys). 7.30 p.m., dinner at Grand Hotel de France. Sleep at Grand Hotel de France.

SUNDAY, Aug. 21.—9.0 a.m., breakfast at Grand Hotel de France. 2.0 p.m., lunch at Grand Hotel de France. 7.30 p.m., dinner at Grand Hotel de France. English Church Services at 11 a.m. and 3.30 p.m., at the Church of All Saints, Ile Lacroix. Sleep at Grand Hotel de France.

MONDAY, Aug. 22.—8.30 a.m., breakfast at Grand Hotel de France, Rouen. 10.30 a.m., visit church of St. Ouen (14-18 cys). 1.30 p.m., lunch at Grand Hotel de France. Sketching in afternoon. 7.30 p.m., dinner at Grand Hotel de France. Sleep at Grand Hotel de France. (Note: Other places worth seeing are the Palais de Justice, the Hotel de Ville, the Churches of St. Patrice, St. Godard, St. Gervais, St. Mallon, and St. Laurent, and the old Streets of Epicerie and Grosse Horloge.)

TUESDAY, Aug. 23.—8.30 a.m., breakfast at Grand Hotel de France. Sketching in morning. 12.30 p.m., lunch at Grand Hotel de France. 2.9 p.m., leave Rouen for Paris. 4.35 p.m., arrive at Paris (Rue St. Lazare). 7.30 p.m., dinner at Hotel de Lille et d'Albion, 223, Rue St. Honoré, Paris. Sleep at Hotel de Lille et d'Albion.

WEDNESDAY, Aug. 24.—8.30 a.m., breakfast at Hotel de Lille et d'Albion. 10.30 a.m., visit Cathedral de Notre Dame. 12.0 noon, visit church of Sainte Chapelle. 1.30 p.m., lunch at Hotel de Lille et d'Albion. 3.30 p.m., visit Hotel de Ville. 7.30 p.m., dinner at Hotel de Lille et d'Albion. Sleep at Hotel de Lille et d'Albion.

THURSDAY, Aug. 25th.—8.30 a.m., breakfast at Hotel de Lille et d'Albion. 10.30 a.m., visit the Louvre. 1.30 p.m., lunch at Hotel de Lille et d'Albion. 3.30 p.m., visit the Pantheon. 7.30 p.m., dinner at Hotel de Lille et d'Albion. Sleep at Hotel de Lille et d'Albion.

FRIDAY, Aug. 26.—8.30 a.m., breakfast at Hotel de Lille et d'Albion. 10.30 a.m., visit the Opera House. 1.0 p.m., members joining the party for the first week only, leave Paris (Rue St. Lazare) for London, via Havre. 1.30 p.m., lunch at Hotel de Lille et d'Albion. 3.30 p.m., visit the Church of the Madeleine. 7.30 p.m., dinner at Hotel de Lille et d'Albion. Sleep at Hotel de Lille et d'Albion. 9.45 p.m., members joining the party for the second week only, leave London (Waterloo) for Paris, via Havre. They are recommended to leave Havre at 12.23 p.m. on Saturday, Aug. 27, arriving at Paris (St. Lazare) at 4.35 p.m.

SATURDAY, Aug. 27.—8.30 a.m., breakfast at Hotel de Lille et d'Albion. 9.55 a.m., leave Paris (Rue de Dunkerque) for Chantilly. 10.35 a.m., arrive at Chantilly. Visit Chateau. 1.30 p.m., lunch at Hotel d'Angleterre, Chantilly. Sketching in afternoon. 5.35 p.m., leave Chantilly for Paris. 6.25 p.m., arrive at Paris. 7.30 p.m., dine at Hotel de Lille et d'Albion. Sleep at Hotel de Lille et d'Albion.

SUNDAY, Aug. 28.—9.0 a.m., Breakfast at Hotel de Lille et d'Albion. 2.0 p.m., lunch at Hotel de Lille et d'Albion. 7.30 p.m., dinner at Hotel de Lille et d'Albion. English Church Services: St. George's, Rue des Bassins, 8.30, 10.30, and 7.30; English Church, Rue d'Agnesseau, 11.0, 3.30, and 8.0. Sleep at Hotel de Lille et d'Albion.

MONDAY, Aug. 29.—7.0 a.m., breakfast at Hotel de Lille et d'Albion. 8.20 a.m., leave Paris for Evreux. 10.31 a.m., arrive at Evreux, visit Cathedral. 1. p.m., lunch at Hotel, Evreux. 2.20 p.m., leave Evreux for Lisieux. 4.31 p.m., arrive at Lisieux. 7.30 p.m., dinner at Hotel de France, Lisieux. Sleep at Hotel de France.

TUESDAY, Aug. 30.—8.30 a.m., Breakfast at Hotel de France. 10.30 a.m., visit Cathedral (1045). 1.30 p.m., lunch at Hotel de France. Walk to Mesnil Guillaume Chateau, three miles from Lisieux. 7.30 p.m., dinner at Hotel de France. Sleep at Hotel de France.

WEDNESDAY, Aug. 31.—8.30 a.m., breakfast at Hotel de France. Sketching in morning—many old houses are worth visiting. 12.32 p.m., leave Lisieux for Caen. 1.28 p.m., arrive at Caen. 2.0 p.m., lunch at Hotel d'Angleterre, Caen. 3.30 p.m., visit Cathedral of St. Etienne (Abbaye aux Hommes, 1074). 7.30 p.m., dinner at Hotel d'Angleterre. Sleep at Hotel d'Angleterre.

THURSDAY, Sept. 1.—8.30 a.m., breakfast at Hotel d'Angleterre. 10.30 p.m., visit Church of La Trinite (Abbaye aux Dames). 1.30 p.m., lunch at Hotel d'Angleterre. Sketching in afternoon. (Note: Other places worth visiting are the Churches of St. Jean, St.

Sauveur, and St. Pierre, the University (1417-1450), Old Walls, Palace of the Bishop of Bayeux, and the Hotel de Thau. Short excursions can be made to the Quarries (two miles), and the Abbey d'Ardenne (six miles). 7.30 p.m., dinner at Hotel d'Angleterre. Sleep at Hotel d'Angleterre.

FRIDAY, Sep. 2.—8.30 a.m., breakfast at Hotel d'Angleterre. 12.0 p.m., lunch. 4.30 p.m., dinner. 6.58 p.m., leave Caen for Cherbourg. 10.26 p.m., arrive Cherbourg. 11.30 p.m., boat leaves Cherbourg for Southampton.

SATURDAY, Sep. 3.—8.45 a.m., leave Southampton. 10.40 a.m., arrive London (Waterloo).

Tickets for the excursion must be obtained from the Secretaries on or before August 1st, and applications for them must be accompanied by remittances at the following rates:—For the whole tour, according to this programme, £15; for the first portion, returning August 26th, £9 10s.; for the second portion, starting August 26th, £10 10s.

Each member will be entitled to introduce one friend (lady or gentleman), whose name and address, and, if a gentleman, whose profession, must be stated when application is made for his ticket, and such application shall be subject to the Council's veto.

These rates include travelling (first class between London and Paris via Havre; second class between Paris and Chantilly and Paris and Cherbourg; and first class from Cherbourg to London), and hotel expenses, portage, sight-seeing fees, and the expenses of a conductor, but not beer, wines, or spirits. Two beds will be placed in each room, therefore Members who may wish to be companions are requested to mention this fact when taking tickets.

Members are requested to encumber themselves with as little luggage as possible.

Arrangements will be made for washing linen at Paris. It will be found advisable to carry soap, as it is never provided at French hotels.

Members are requested to label their luggage each day carefully, and to look after it themselves, although all necessary portage will be provided, and everything possible done to prevent mishap.

OBITUARY.

THE death is announced of Mr. J. E. Jackson, builder, and in later years an architect, of 33, Park-place, Cardiff, which took place on Friday at Tredelech, near Cardiff, the residence of his son-in-law, Mr. Lascelles Carr. The deceased was born in 1817 at Monmouth, where his father, who was the son of an Edinburgh surveyor, had occupied a very prominent position, both in his business as a builder and as a politician. Educated at Monmouth Grammar School, on leaving it, in 1834, Mr. Jackson became engaged in his father's business, and his early manhood was occupied in the restoration of many of the interesting parish churches of Monmouthshire and the adjoining counties. While so engaged he was—says the *South Wales Daily News*—brought into close and frequent contact with the late Sir Gilbert Scott, Mr. G. E. Street, and Mr. M. and Sir J. D. Wyatt. He was a "craftsman-architect" of the old school, as distinguished from the professional architect. As a craftsman-architect, Mr. Jackson not only designed his buildings, but constructed them also with marked success. He came to settle in Cardiff thirty years ago, at a time when Cardiff, even in its most important streets, possessed but few buildings of any importance, and he was one of the first to bring private enterprise to bear in rearing edifices in Cardiff which may be compared not unfavourably with the buildings of the most important towns in the provinces, and to his enterprise and skill Cardiff is very largely indebted for much of the improvement which has been effected in its street architecture during the past quarter of a century. Mr. Jackson married Mary, third daughter of Edward Lucas Bass, of Monmouth, and two years ago Mr. and Mrs. Jackson celebrated their golden wedding at their residence, Park-place, Cardiff. Besides his widow, he leaves one son, Mr. C. J. Jackson, barrister, of Cardiff, and two daughters, both married.

Mr. John Shaw, cabinet-maker, of West Derby, Liverpool, died on Saturday, at an advanced age, in that city. The late Mr. Shaw was perhaps most widely known from the active interest he had taken during the past thirty years or more in public affairs. He was at one time a prominent figure at important public meetings, and was more recently an active member of the Liverpool Burial Board, West Derby Waste Land Commissioners, and other local bodies.

FILTERING WATER.—II.

In making any description of brick-built filter (or it may be made with concrete walls and bottom), it is requisite that the walls and bottom be puddled outside with clay. Water will only too readily find its way through brickwork and even concrete, and it is not so much water passing out of the filter that has to be guarded against as the possible liquid inflow. Clay is practically impervious to water; but, to make quite sure, if the clay is very wet, it is worked or puddled to express some of the liquid it holds, and to make it more consistent or dense.

In dealing with roof-water, it can be readily understood that the first part of this rainfall washes many objectionable matters down through the gutters, and until the introduction of the somewhat modern "separators," this first washing of the roof was a feature difficult to deal with. The "rain-water separators" that can now be obtained act very well, and their action is to divert the first two or three minutes' fall into the drains or elsewhere; but after this quantity has passed a movement occurs in the mechanism which sends the water through a different outlet, which leads to the storage tanks. By this means a very good water is obtainable with little trouble, the gutters only requiring to be freed from leaves and general debris somewhat frequently. In a general way this water may be used without filtration, but it is necessary in the autumn to keep the gutters as free from leaves as possible (assuming there are trees near by), as the foliage of different trees have characteristics of their own: oak leaves, for instance, if soaked in water, impart tannic acid.

If roof water requires any filtration at all, it is usually considered that sand is sufficient, or, better still, let the water be filtered through porous stoneware. In many forms of modern filters porous stoneware forms a conspicuous part. It is really unglazed pottery-ware as a rule, and obtainable in different forms from any well-known pottery factors. Its pores are so minute as to bar the passage of everything except what exists in an actually fluid form. Coloured liquids, however fluid their colouring matter may appear to be, usually arrive colourless on the other side. Impurities penetrate such a short distance that the cleaning of the material is effected by scrubbing with a brush. Should there, however, be a doubt, then assurance can be gained by boiling and scraping the stoneware if its size will permit. It will be understood that the passage of water through such a dense material as this is necessarily slow, and the action in this case, as with sand, is purely mechanical. The stone will not arrest impurities of a gaseous or strictly liquid nature by any attractive property as we experience with animal carbon. A filter that is made with a porous-pot filled with loose carbon stands decidedly high in the standard of efficiency. As a last reference to roof-water, it has to be pointed out that the few remarks made are intended to apply to roofs formed of materials that are not deleterious to health. A roof with copper or lead sheathing would introduce objectionable features, so would roofs that are treated with certain paint materials. The same remarks apply to the materials of the gutters, &c. It must always be remembered that in dealing with rain-water, very different results may be obtained to what are experienced with well-waters. Rain-water is soft—very so; and soft-water has a very vigorous action upon many substances. Its action upon lead has in several cases been sufficient to bring about epidemics of lead-poisoning in districts where soft-water has been distributed through lead pipes, or stored in lead-lined cisterns. Hard-water, water having lime (chalk) in solution, acts very differently; in fact, it, in a measure, has a preservative effect.

We can now speak of materials which not only act merely as strainers to arrest impurities, but have an attractive or absorbent power, an inclination to arrest impurities that merely come in contact, or come within their influence. The material that needs to come first is animal carbon, a charcoal obtained by subjecting bones to a high temperature in a closed space, practically the same means that is adopted to convert wood into charcoal. Now, although wood and animal carbons are prepared in a similar manner, they differ very greatly in their capabilities of filtration. Wood charcoal will act as a strainer, by arresting solid impurities that are too large to pass through its minute pores; but this is about

all it will do. It is almost inert as regards deodorising or dealing with gaseous impurities. On the other hand, animal carbon has a most pronounced and active effect in this direction. There is hardly a single cause of impurity that this substance will not deal with. If we have in water organic or colouring matters in a fine state of division, or in a fluid state, sufficient to permit their passing through the minute pores of charcoal, so far as the straining qualities of the material is concerned; still, these matters or fluids would be arrested by animal carbon. Undoubtedly the action is that of attraction, for there are other ways of ascertaining that carbon of this kind will deal with impurities under different conditions, and it always seems to act as if it were a collecting place for foul materials. All this goes to show that animal carbon really excels as a purifying material in filtration works, but, like many other tolerably perfect things, it has its failings. In the first place, it is merely a collecting place for foul materials, as just stated; it simply stores them up, and, as explained with sand, it is not long before the collection becomes a very unsuitable mass to pass water through at all. It will be understood that as the impurities go on collecting, they choke up the pores in the charcoal, and the good and active qualities we seek for are destroyed for the time being. Further than this, it is openly asserted by most authorities that this ordinary description of bone carbon is positively favourable to a low form of life when once the necessary impure matter is collected within its pores. By this is meant that when foul matter has collected or begun to collect in the mass of the filtering material, the nature of the carbon goes to promote the formation of life, or what we may term the putrefying action of the impure substances.

This doubtless seems a very serious drawback to the use of animal carbon, notwithstanding its otherwise good character. It certainly is a fault, but not sufficient to put it entirely out of favour. It is largely used by many very good firms, and the writer uses it frequently. The fault is not so serious that it cannot be remedied with a moderate degree of ease, yet it is sufficiently serious to cause a deal of investigation to be made towards finding some substances, or combination of substances, that will act without this ill-feature, as will be explained directly.

The remedy for the trouble is to provide ample facilities for removing this filtering material periodically for cleaning purposes. This cleaning process is most essential, as will be understood, and the somewhat prevalent idea that filters (of all kinds) never require attention after once having been fitted up and got to work satisfactorily, is most erroneous. In fact, it is apt to prove highly dangerous, for there is no gainsaying the fact that a filter can get into such a condition that water passed through it would be more injurious to health than drinking the unfiltered water. There is a considerable difference of opinion as to how often animal carbon should be purified. Some authorities suggest every year; others have even suggested so short a time as a few weeks; but in a general way it is recommended that the charge of carbon be changed every six months. It is easy enough to see how different opinions upon this can be formed, for in no two cases can the degree of impurity of the water be alike, nor can the nature of the impurity be similar either. Six months cannot be regarded as a fixed period by any means; it will bear a deal of variation, according to the state of the water. Some waters vary in purity at different times of the year, and this has often to be considered.

The purifying of animal carbon is a somewhat inconvenient business, so much so that in many cases it is preferred to remove the foul charge and replace it with new, and in any case it is usually necessary to have two charges, as the foul one has to be sent to the manufactory to be purified. This form of carbon, in as good and perfect a quality as can be obtained, is to be purchased for 36s. per cwt., so it can be judged whether the carriage and other charges are worth paying on the fouled material. It is, of course, governed by the quantity and distance. The purifying is a re-carbonising process, a burning with exclusion of air. Previous to this the material is thoroughly washed and boiled to remove all foreign substances possible; otherwise to carbonise the dirt matter in the pores would only go to choke them. It would be thought that a good boiling would not only cleanse the carbon, but

quite destroy all germs, animalcules, and organisms that have life in the foul collection; but it is authoritatively asserted that water at boiling temperature will not wholly destroy this life, and the higher temperature of the carbonising process is absolutely necessary. It has been rather doubtfully asserted that even this is not sufficient, it having been thought on some occasions that carbon treated this way showed signs of life quicker afterwards than if quite new carbon were used.

The general arrangement when treating water that needs both sand and carbon filtration (for drinking purposes) is to keep the two kinds of filtration separate. The sand filtration is generally carried out in a filter pit or bed near the source of the water supply, so that the flow from one to the other is natural and needs no mechanical aid. From this filter bed the water passes into a reservoir of some kind. From this source it flows or is pumped to the different points required, for some purposes no further filtration being needed; but for cooking and general domestic and drinking purposes, the carbon filtration is arranged in the house cisterns or in an auxiliary cistern beside them. Carbon filters are sufficiently expensive to insure care being exercised not to treat more water than is really necessary, and this kind of filtration is done as immediately before the water is used as possible. There would be a loss, and not a gain, in allowing the water, which has been subjected to this final filtration, to rest and remain unused for any length of time.

Should it, under some circumstances, be desirable to pass the water through carbon immediately after the sand, then care must be devoted to arrange so that the carbon portion is sufficient and compact, yet not in such bulk, or so spread about as to be extravagant in material. The next paper will speak of materials introduced to overcome or minimise the failings that animal carbon has.

(To be continued.)

MASONRY RETAINING WALLS.

FOR low retaining walls of masonry, the recognised section is the trapezoidal form, as being the most economical for walls of ordinary height. A recent writer, Professor M. Merriam, has shown the conditions of economic construction, and has given a table showing the thicknesses for walls of a given height to sustain a level bank of earth whose angle of repose is 34°, and which weighs 100lb. to the cubic foot. The height of wall is taken at 18ft., and the weight of masonry as 150lb. per cubic foot. The well-known formula for vertical back is given—

$$P = \frac{1}{2} w h^2 \tan^2 (45 - \frac{1}{2} \phi),$$

The normal pressure P is found to be 5,690lb. when the back of wall is inclined forward at a batter of 2in. to the foot, or inclination to horizontal, $\theta = 99^\circ 28'$. Assuming a top thickness of wall of 1ft., and a base thickness of 9.5ft., the "cubic yards" column gives 3.50 as the quantity of masonry in one linear foot of wall. For a wall with vertical back, where $\theta = 90^\circ$, for the same top thickness and base thickness of 7.3, the cubic yards are tabulated at 2.77, and the earth pressure on P being 4,580lb.; so that it is evident the sections of vertical wall require less masonry than those with their backs with a forward batter, and that the wall, as a consequence, needs not to be so thick at the base. In another column of the same table, under "per cent.," is given the comparison with vertical rectangular walls, which is taken as 100. Thus, in the wall above mentioned with battered back, 67 per cent. is shown, and in the vertical wall only 53 per cent. The table shows walls of 2ft., 3ft., and other top thicknesses, by which the economic section may be obtained.

Owing to the curtailment of their Carr-street premises by an extensive scheme of street improvement, Messrs. Peils and Son, who have been established in Ipswich as builders for over half a century, have just erected a new range of workshops in Old Foundry-road, at the rear of their old works. The two chief workshops are of two floors each, one being 60ft. by 20ft., the other 30ft. by 17ft. A new chimney-shaft and offices have been erected, and an old steam mill on the opposite side of Old Foundry-road has been converted into stores and stables.

Building Intelligence.

ALDERSHOT.—Her Majesty the Queen laid, on Monday, the foundation-stone of the new Military Church of St. George in Stanhope Lines, South Camp. The building is of Early English character, the walls being in red bricks and the dressings in St. Aldhelm Box Ground stone from the quarries of the Bath Stone Firms, Limited, Bath. The contract is being carried out by Messrs. J. Dorey and Co., of Brentford, under the superintendence of Colonel Waller, Major Pitt, and Lieutenant Michie. When finished it will have a length of 169ft. and a width of 64ft., and is calculated to seat 1,012 people.

CHILWORTH.—The new Franciscan church and friary on Blackheath were opened on Thursday in last week. The building is in the Late Perpendicular style, of a very severe character. It is constructed of Ewhurst stone, with Chilmark stone facings, and the internal woodwork is of oak and Oregon pine. In addition to the high altar there are four side altars, which are chiefly of alabaster. There is accommodation in the friary for 26 members of the Order. The architect was Mr. Walters, F.S.A., of Westminster, and the contractors were Messrs. Longley and Sons, of Crawley.

COVENTRY.—New board schools are in course of erection in Priory-street. Viewed from that street, the building appears to be a two-story structure; but upon approaching it on the Wheatley-street and Cox-street sides it will be seen that the main portion is raised upon arcades and columns. Both sexes will be massed at the opening of school in the assembly-hall, and afterwards dismissed to the various classrooms—of which there are fourteen, seven for the boys and seven for girls—which open on all sides, for lessons. The infants' department is entirely separate from the other two. The large hall will be lighted by clerestory windows, and the timbers of the roof—pitch-pine, wrought and varnished—will be exposed to view. Private rooms are provided for the head teachers. The schools will be ventilated on the system of Messrs. Jackson and Son, of Birmingham. The architects are Messrs. G. and I. Steane; Mr. J. T. Winthrop is the contractor, and Mr. A. Davies is clerk of the works.

EDINBURGH.—The Drumsheugh Baths in Old Queensferry-road, which were recently destroyed by fire, are about to be reconstructed on the same site. It is intended to utilise the outer walls in the construction of the new building, which, when completed, will be similar in almost every respect to the old one. The new building will, however, be fireproof, the plans providing for a concrete floor over the engine-room, which is situated in one of the wings below the level of the large pond. The building is executed in the Moorish style, and finished in rough-cast with brick dressings. As the swimming-pond is situated some depth below the level of the street, the main entrance is on the third floor. Here is situated the club-master's office with vestibule, and descending to the next floor is the Turkish baths department. It comprises tepidarium, outer and inner caldarium, plunge bath, and dressing-rooms. On the lower floor is situated the swimming-pond, 70ft. by 35ft., a gymnasium, the washing-rooms and lavatories. The swimming-pond will be lighted by two lantern lights from the roof, and also by flat roof-lights over the galleries. The architects are Messrs. Burnet, Son, and Campbell, Glasgow; and the contract has been entrusted to Messrs. Beattie and Sons, Edinburgh. The reconstruction will cost £6,000.

GREAT CROSBY.—Dr. O'Reilly, Roman Catholic Bishop of Liverpool, on Sunday blessed and placed the foundation stone of the new church of SS. Peter and Paul, Great Crosby. It is Early English in style, designed by the firm of Messrs. Synott and Powell, architects, of Harrington-street, Liverpool, and will replace, at a cost of £6,000, the old church, to the rear of which it is being built by the sole contractor, Mr. Samuel Webster, of Bootle. It will seat 500 persons, and will consist of nave, with two side aisles and two side chapels, sacristy and organ-chamber, the eastern end terminating in an octagonal apse. The old presbytery has been demolished, and a new one will be built adjoining the church. The masonry will be executed by Mr. James McDermott, of Walton; and the brickwork by Messrs. Sawyers, of Waterloo.

LIVERPOOL.—The foundation stone of the new hospital in Smithdown-road, in connection with the Toxteth workhouse, was laid on Monday. The new hospital is to cost £25,799, the architects being Messrs. C. O. Ellison and Son, of Liverpool. The premises are arranged in blocks as follows:—1, the porter's lodge and reception and vagrants' wards; 2, hospital pavilions. 3, administration block; and 4, nurses' home. The hospital is arranged in seven two-story pavilions, running north and south, each with space all round, and approached by a 10ft. corridor, open on both sides. Of these pavilions, four only are included in the present contract. The first pavilion to the north consists of four wards, two for 18 and two for 16 beds each, with 8ft. wall space where required for special cases, and 6ft. for the others. Each of these wards is complete in itself, and has its own bath, lavatories, and entrance and airing court. The first pavilion to the south is for 64 beds, in two long wards for 30 each, and two wards for two each, with two day rooms at the south end. A kitchen is provided at the entrance end of each large ward. The large wards and the day rooms are separated by a light screen of pitch-pine and glass, and fronting the day rooms is an airing balcony, having a south aspect and special stairs. Three other large pavilions, one for 72 and two for 56 beds each, are provided for, but one only is to be built at present, together with one on the north side for 48 beds. The buildings are of ordinary brickwork with red bricks in prominent places, and red stone heads and sills. The entire work is being done under the supervision of the architects, Mr. Mather acting as clerk of works.

—St. Saviour's Church, Falkner-square, has recently undergone extensive alterations, the chancel having been entirely reconstructed and enlarged. The main walls of the church are painted in various shades of terracotta, which colour is repeated with pale buff on the front of the galleries and pulpit. The choir stalls are constructed of walnut on Classical lines. The chancel wall colouring, whilst being generally similar, is richer and of more warmth and luminosity than that applied to the nave. The panels of the dome are worked in a rich geometrical diaper, of which celestial blue is the prevailing colour, and are broken up by the introduction of seven circular panels, the central one, on which is painted the Saviour, being of glass. The remaining six will be filled with heads of the Apostles. These are being painted by Mr. W. H. Lonsdale, and are not yet completed. The whole forms a harmony in dull red, celestial blue, and gold, executed by Messrs. Shrigley and Hunt, of Lancaster.

MANCHESTER CATHEDRAL RESTORATION.—The finishing stroke of the present restoration of Manchester Cathedral, which has now been going on for some twelve years or more from plans by Mr. Crowther, the architect to the Dean and Chapter, has been commenced. This is the taking up of the entire flooring in the south aisle of the nave, forming what are known as the Trafford Chapel and Brown's Chapel, and lowering it to the same level as the floor of the nave. This is preparatory to the scheme for relaying the whole of the floor of the nave in diamond-shaped blocks of black and white marble. By the time this work is completed on the south side of the nave, it is anticipated that the new south porch and baptistry will also be completed, and the former south entrance, which has been closed for a considerable time, will be once more utilised.

SANDGATE.—The Beach Rocks Convalescent Home at Sandgate, connected with the London Samaritan Society, was opened on Saturday. The principal front faces the sea, and the terrace is approached from the beach by broad flights of steps. The entrance is from Sandgate High-street, the main thoroughfare from Folkestone to Hythe. The building has been erected by Messrs. Wallis and Sons, contractors, of Maidstone, from the designs of Messrs. J. Shaw and W. M. Dabbs, of London. The building and the furniture have cost in all about £20,000. It was the aim of the designer to get as much light and air within the building as possible. The porchway is fitted with bevelled plate-glass, and the same material is used for the inner doors and the screens, and also for the doors of the dining hall, which has large plate-glass windows looking out on to the sea. The home comprises a central block and two wings. It is constructed of red brick, with Portland stone dressings; the upper

story is rough cast, and the roof of Broseley tiles. The style may be described as Victorian Gothic. The floors of the corridor are covered with red tiles, herringboned, and with borders of black tiles. The dining hall is 50ft. by 28ft., and 20ft. from the floor to the ceiling, which is coved and panelled. At each end there is a tiled fireplace, with overmantels. The floors throughout the building are of herringboned wood blocks. The bedrooms contain altogether 250 beds.

SUNDERLAND.—The foundation stone of the new Sunderland and North Durham Eye Infirmary will be laid on Saturday (to-morrow). The building is two stories high, and provides accommodation for 16 in-patients in four wards, two each for males and females, each ward having separate w.c. and lavatory in a through-ventilated outshoot in direct communication with the ward. These, with two nurses' rooms, two bath-rooms (one for males and one for females), servants' bedroom, operating room (with north light, lavatory, and sink), and linen closets, occupy the whole of the first floor. Ample accommodation can be provided in the attics for nurses and servants. The style of the building is Domestic Queen Anne. It is faced with Grosmont red bricks, relieved by stringcourses of moulded red rubber bricks and massive stone cornice with dental blocks, and the roof is covered with Broseley tiles. The building is being erected from designs, and under the superintendence of Mr. J. Wardle Donald, A.R.I.B.A., of South Shields, by Messrs. D. and J. Ranken, of Sunderland, at a cost of £4,590, Mr. L. R. Todd being the clerk of works.

Engineering Notes.

PRESTON.—The Duke of Edinburgh opened, on Saturday, the Albert Edward Dock, constructed by the Preston Corporation. The entrance to the tidal basin is 90ft. wide at the Bullnose, and tapers to 66ft. at the outer tidal gates. Vessels entering the dock have to pass through the outer pair of tidal gates into the tidal basin of 4½ acres, in which basin the traffic will be marshalled. The total length of the tidal basin is 850ft., and the width 300ft., with a quayside of 560 lineal yards. The tidal basin is connected with the wet dock by a lock 550ft. in length and 66ft. in width, divided by intermediate gates into two compartments, one 325ft. long and the other 225ft. long, enabling vessels up to 225ft. to use the western lock, vessels over 225ft. and under 325ft. will use the eastern lock, while vessels over 325ft. will require the full length of the locks. The wet dock is 40 acres in extent. The dock sill is 38ft. below coping level, giving 29ft. of water at high water ordinary spring tides. The total length of dock is 3,020ft. by 600ft. wide, giving a quayside of 2,266 lineal yards. Entrances for two proposed graving docks 50ft. and 66ft. wide respectively have been put in at the south-west corner of the dock, and temporary dams put across the openings. An entrance has also been built at the north side of the dock for the proposed timber pond of 20 acres, to be formed at the west end of the old river course. One small warehouse, 200ft. by 50ft., has been erected, and there are 4,480 yards of permanent railway and sidings. The works were designed by Messrs. Garlick and Sykes, engineers, of Preston, and the engineers of the scheme submitted to Parliament were the late Sir John Coode and Mr. Benjamin Sykes, M.I.C.E., F.G.S. The works were commenced under the engineership of Mr. Edward Garlick, M.I.C.E., and on his retirement through ill-health were carried out to completion by his partner, Mr. Sykes, with Mr. T. G. Lumb, A.M.I.C.E., resident engineer, and Mr. Robert Sykes as assistant resident engineer. The original contract of £456,600 has been greatly exceeded owing to various causes, and the dock and river diversion have cost over one million sterling.

Important extensions are about to be carried out at George Watson's College for Boys, at Edinburgh, from plans by Messrs. McGibbon and Ross, of that city. They include the addition of a three-storied wing at each end of the present buildings in keeping with the existing main structure, and at the rear a new gymnasium, 70ft. by 50ft., and a workshop and laboratory will be provided.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

LIVERPOOL ENGINEERING SOCIETY.—On Saturday afternoon, Mr. J. H. Tudsbery Turner, B.Sc., M.Inst.C.E., who has been appointed assistant secretary of the Institute of Civil Engineers, London, was the recipient of service of plate subscribed for by members of the Liverpool Engineering Society, in recognition of his services as honorary secretary for the past five years. The presentation took place in the rooms of the United Service Club, Dale-street, Liverpool, and there was a large attendance, including Alderman J. T. Wood, C.C. (president), Mr. R. Johnston (president-elect), Mr. Percy Boulnois and Professor Hele-Shaw (vice-presidents). Alderman Wood made the presentation, and also presented Mrs. Turner with a diamond bracelet.

THE PROTECTION OF ANCIENT BUILDINGS.—The 15th annual meeting of the Society for the Protection of Ancient Buildings was held on Tuesday evening in the old hall of Barnard's Inn, Holborn. His Honour Judge Lushington presided, and in the course of his address said that the society was actuated by the modern historical spirit which desired to promote a care for, interest in, and study of the past, and piety towards the past. That was often done in a narrow parochial way; but it need not be so. Had the age in which we lived any real care for outward beauty or for the arts that echoed and illustrated that outward beauty, or for the historical associations that were often so very deeply bound up with ancient and beautiful monuments? He thought he would be a brave person who would claim praise for it in that respect. Let them think of the long lines of jerry-built houses and the loss of the race of art workmen disappearing from among us. Let anyone think of the immense difficulty under which architecture, painting, and sculpture were now being carried on among us. There had been a beautiful architecture in England, and a fine race of art workmen, and a great number of churches scattered up and down the land, so that there really had been opportunity for everyone to familiarise himself with beauty and dignity of work. Those churches which had been praised by the poets were the victims of our ignoble restoration. Mr. Reginald T. Blomfield, the next speaker, said that he thought the architects were the people who needed educating more than anyone else on this point, as they were the agents by whom the work of what was called restoration was performed. Mr. Hunter expressed the hope that the whole site of Christ's Hospital in Newgate-street would not be sold, and that a jealous eye might be kept upon it to prevent it from being devoted exclusively to building purposes. Mr. William Morris moved a vote of thanks to the chairman.

ARCHÆOLOGICAL.

THE TOWER OF LONDON.—A visit was paid to the Tower of London on Wednesday by the members of the London and Middlesex Archæological Society, when the various points of interest in connection with the buildings were described by Messrs. E. W. Brabrook, F.S.A., R. Chandler, E. Freshfield, jun., F.S.A., Major H. A. Joseph, Lieutenant-Colonel G. Lambert, F.S.A., T. Milbourn, E. W. Streeter, and A. White, F.S.A.

The Dudley collection of pictures fetched at the auction on Saturday £101,320. "The Crucifixion," by Raphael, went for 10,600 guineas, and "A View in Holland," by Hobbema and Van de Velde, 9,600 guineas.

Messrs. John Jameson and Son, Limited, of Dublin, are about to erect extensive spirit stores and other buildings. The constructional iron and steel work, also the fireproof floors and roofs, have been placed in the hands of Messrs. Homan and Rodgers, of Manchester and London.

A new public hall has been erected at Rhondda Valley, and special attention has been paid to the ventilation, which is carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

Mr. R. F. Dennis, town surveyor, West Cowes, has been instructed to prepare plans, &c., for an esplanade and sea-wall having a frontage of over 1,000ft., which is to form part of a scheme that will ultimately connect Gurnard with Cowes, via the shore, and at the same time provide an esplanade of over three-quarters of a mile in length along one of the most picturesque parts of the Solent.

COMPETITIONS.

GRAY'S INN.—An uncommonly uncanny-looking competition is on foot for the erection of a new chapel in Gray's Inn-gardens, on the site of the existing classrooms south of Raymond Buildings, by the benchers. "Gratuitous designs" are asked for, and no information can be given as to how the author of the chosen design is to be paid. No date is fixed for the reception of the plans, no scale is fixed for the drawings, no referee will be engaged, so far as can be ascertained, and it is optional as to whether the competitors fix mottoes or their names to their designs. The shadow of a friend already cut out for the work seems to throw a shade of doubt over the proceeding, and may well cause architects to mind how they proceed. Canvassing the benchers is not forbidden, in the conditions, at any rate, and all is fair, they say, in love and war. The cost is not to exceed £3,000, and the windows are to incorporate the old glass in the present chapel. This is another instance of how lawyers view a fair competition for architects.

OXFORD.—At last the award in the new Municipal Buildings competition has been confirmed by the town council, who, on Wednesday last, elected Mr. H. T. Hare, A.R.I.B.A., as architect for the work in accordance with the report of Mr. T. E. Colclutt, F.R.I.B.A., the referee. This design, marked by the figure 5, is the one which we unhesitatingly placed first when reviewing all the five competition designs in last week's BUILDING NEWS, and there can be no doubt that it is the best scheme both for plan as well as elevation of those submitted in the final contest. We congratulate both the corporation as well as the architect on the satisfactory result thus recorded. The sum stated to be expended is £60,000. We hope at an early date to be enabled to illustrate all of the designs, when our readers will be able to see for themselves the merits of the various schemes. The authors of the other plans are:—No. 2, Mr. James B. Hinks, Liverpool; No. 1, Charles Bell, F.R.I.B.A., London; No. 4, Mr. Ernest Runtz, London; and, No. 3, Messrs. Cheston and Perkin, London.

ROATH, CARDIFF.—Mr. William Bevan, architect, Cardiff, has been selected as the architect for the proposed Lady-chapel in St. Peter's Church, Roath. Local stone is proposed to be used for the walls, with freestone quoins. The chapel is provided with aisles, and will seat about 80 worshippers.

CHIPS.

The old burial-ground in the Hackney-road was opened on Tuesday as a public recreation ground. There is just one acre in this open space, and the laying out and planting cost the Public Gardens Association £150. The Earl of Meath mentioned that the Association had already spent £30,000 in laying out such open spaces for the enjoyment of the people.

An infants' school is about to be added at the side of St. Margaret's Church, Anfield, Liverpool, from plans by Messrs. Fry.

A tablet in memory of the late Dean Elliott has just been placed on the north wall of Bristol Cathedral. It is of white Italian marble, and is 5ft. 4in. high by 3ft. wide. Mr. T. Tiley, of Bristol, was the sculptor.

The Governors of the People's Palace for East London desire to hold an exhibition of pictures in the Queen's Hall from August 13 to September 10. A similar exhibition last year was visited by sixty thousand six hundred persons, principally of the working classes. The Governors appeal again for the loan of good pictures.

Mr. John Armitage, late of Sheffield, drain-pipe and fire-brick manufacturer, has left personalty amounting to £21,000.

The annual congress of archæological societies in union with the Society of Antiquaries is to be held on the 20th and 21st inst. On the former day the members of the congress will dine together, and Mr. Franks will hold a reception at Burlington House on the same evening. On the 21st the archæologists are to make an excursion to Silchester.

A Venetian glass vase has been manufactured by the artists engaged at Dr. Salvati's furnace at Olympia, for presentation to the Queen on the occasion of the anniversary of her Majesty's coronation day. The vase has been executed by Giuseppe Barovier, assisted by his brothers Pietro and Vittorio, and is their own gift, the work having been done in their spare time.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

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The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL, XLII, XLVII, XLIX, L, LI, LIII, LIV, LVIII, LIX, and LX, may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—W. R. T. and S. M. Co.—B. G. and Co.—Cantab.—J. R. S. (Norwich).—F. R.—Metropole.

"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"Unitate Fortior," "St. Hughes," "Smilash the Goth," "Excelsior," "Supervision," "Wyandotte," "Black and White," "Ajax," "Vulcan," "Rotenberger," "Q. E. F.," "Cottager," "Yorkshire Tradition," "Black Prince," "Nemfardi," "B." in a circle, "Sweet Auburn," "Clansman," "Phoenix," "Sector."

ONE WHO NOTICED IT. (Technically you might be right, but we have to judge of the designs fairly all round, and have no doubt as to the correctness of our award.)

Correspondence.

ARCHITECTS' REGISTRATION BILL.

To the Editor of the BUILDING NEWS.

SIR,—As Parliamentary candidates are now in full working order with the general election close at hand, I think it would be wise for provincial, as well as London, architects who are in favour of registration to bestir themselves and see what support the candidates in their respective constituencies are prepared to give to this Bill, should they be returned to the House of Commons. Those who have interested themselves in any Government measure, no matter what its object may have been, know how very difficult it is to obtain the sympathy and promises of members safely seated in the House; and now that candidates are forced to show which way their sympathy lies, every architect, whether in practice or not, provided he has a vote, should seize this opportunity of furthering a cause which the majority of us have at heart, by asking candidates if they are prepared to support the Bill. So that they need not plead ignorance of its provisions, I should advise those who wish to do as I suggest to send to the Queen's printers (Eyre and Spottiswoode) for a copy of the Bill, which can be had for 4d., in-

cluding postage, and this they can place before their men.—I am, &c.,
JAMES W. FRAZER, A.R.I.B.A., M.S.A.
12, Grey-street, Newcastle-on-Tyne, June 29.

POPLAR LIBRARY COMPETITION.

SIR,—As you attribute to me the authorship of the designs marked "Height and Light," which you criticised so unfavourably in your last issue, I shall be obliged if you will correct the statement. You have been misinformed. I did not compete.—I am, &c.,
J. ELMSLY INGLIS.
9, Great Russell-street, Bloomsbury, June 28.

LAND SURVEYING.

SIR,—In reply to "Northman's" letter on p. 883, the scale of Fig. 5 is about $4\frac{1}{2}$ chains to an inch. AF is checked by DEF. If F were measured some distance out the effect would be to revolve DF about D, this would cause F and E to approach to or recede from D. This approach or recession would act in opposite ways on the two points, so that the effect on FE would be doubled and any error would be clearly seen. If F were 100 links out, it would be at once detected, as "Northman" can test by trying it; but I doubt whether he or anyone else could plot 5 links on this scale, as it amounts to only 1.95 of an inch. If BE were measured, as in practice it would be (the method of finding a point on a line given in Fig. 8 is only intended to be used when the marks on a line have been lost and the surveyor does not wish to rechain), any error would be located in its particular triangle as surely as in "Northman's" example. Perhaps the following order of plotting may make it clear to "Northman" that the position of F is checked. Lay down AB, set out C by means of AC and BC, mark F, set out D by means of FD and BD, then check the whole with CD. I have no wish to criticise "Northman's" construction, but he has offsets $1\frac{1}{2}$ chains long on AZ, and the checking of D and B depends upon CYZB appearing in the same straight line; in the event of BZ being wrongly chained, the error would be as difficult to detect as he claims any error in AF Fig. 5 would be; as a matter of fact, any error would be easily detected in either case. I shall be always pleased to have letters on any errors, real or imaginary, in the papers, as the discussion thereon cannot fail to elucidate an obscure point; but is it necessary to assume that because an error, real or imaginary, appears in one diagram all the others are worthless, and the author utterly inexperienced in surveying? In a letter by an anonymous writer, who does not mention his status or experience, a statement to the effect that he "never saw a square field measured in any other way" has two interpretations. G. W. COBHAM.
Gravesend, June 27.

R.I.B.A. EXAM.

SIR,—Allow me, as a candidate of the above, to say a few words as to the nature of a certain question given on the history of architecture in March last, so that I may enable intending candidates to judge as to the range and nature of knowledge they ought to possess on this subject. As far as I can remember, the question given at the exam. was:—"Describe and illustrate with sketches any English cathedral erected during the period selected by the candidate, except Westminster and Salisbury."

Such a question I, for one, cannot admire. It seems to me far more tricky than just, for why should two of our most noted buildings thus be excepted, and more especially without any previous notice to candidates, seeing it has never been done before. I do not think it gives much encouragement for the study of existing examples, because I, and no doubt many others who have had every facility for and have studied Salisbury for years, had unfortunately at the exam. no opportunity of touching upon this question or of showing the fruits of our well-spent time and money. On the other hand, I am led to believe that certain candidates who probably had not even seen a cathedral, but fortunately had, for the purposes of the exam., provided themselves with a brief description of one or two examples copied from books, accompanied with a few sketches, gave satisfaction to the examiner. Such being the case, a candidate in my opinion stands a far better chance of answering such a question as the above by providing himself with a few briefs and sketches from books on different

cathedrals, than if he were to go and measure, say, Lincoln Cathedral, for who can tell which building may be excepted at the exams. of the future?

It is true that a candidate ought to be able to describe more than one cathedral from memory, but I am afraid he cannot retain the intricacies and details belonging to many. Candidates are advised to study from an actual example, if possible; but it is not every one's good fortune to have such an opportunity. Therefore it is only natural under such advice for candidates who find Salisbury or Westminster conveniently situated for them, that they should set their mind on taking from these buildings all the information and sketches they may procure, and they may probably find, after doing so, that they have quite as much as they can comfortably retain for the purposes of the exam. on this subject without either spending time or money in studying another.

I should be pleased to hear the opinion of others on this question.—I am, &c., LINGTONIAN.

PARLIAMENTARY NOTES.

MANCHESTER, SHEFFIELD, AND LINCOLNSHIRE RAILWAY.—Although, after an eight days' inquiry, the House of Lords Committee passed the preamble of the Bill promoted by the Manchester, Sheffield, and Lincolnshire Railway for the extension of their line from Annesley to London, the Royal Assent has not been given to it during the session just ended. Time did not admit of its being read a third time in the Lords, and referred back to the Commons with amendments. The final stages of the measure will be taken, therefore, in the new Parliament.

WATER SUPPLY AND SANITARY MATTERS.

WOODHALL SPA, LINCOLNSHIRE.—The Horncastle rural sanitary authority are considering a sewerage scheme for the above locality, and Mr. Herbert Walker, C.E., of Nottingham, has been instructed to prepare the necessary plans and report upon this question.

EDINBURGH.—A report has been prepared by a committee of the Edinburgh and District Water Trust with reference to the report recently submitted by the consulting engineers on the question of the water supply of the city. The three main recommendations are:—(1) That the Deacon meter should be more largely employed in the checking of waste; (2) that the Trust should apply to the sheriff for more power to regulate the water fittings; and (3) that the Trust should next year apply to Parliament for a Bill for the introduction of a new water supply.

WAKEFIELD.—The first sod of the new Withens reservoir, on the Rishworth Moors, in connection with the Wakefield new waterworks, was cut on Thursday, the 24th ult. The reservoir will have a capacity of 240,000,000 gallons. The works have been let to Mr. Oliver, of Horsham, Kent, and the cost is estimated at £120,000. Mr. H. Rofo, of London, is the engineer.

CHIPS.

A special meeting of the Shrewsbury town council was held on Monday, when plans were submitted by the borough surveyor for the new public baths, which formed the subject of a recent unfortunate competition, and which are to be constructed at a cost of £7,000, near the Quarry Grounds. The plans were unanimously approved.

The Bishop's Stortford local board have unanimously resolved to increase the salary of their surveyor, Mr. R. S. Scott, from £200 to £250 per annum.

Mr. R. A. Sheard has tendered his resignation as a member of the Liversedge Local Board as a protest against the board's selection of Mr. Gott, of Bradford, to carry out the Moorbottom sewerage scheme.

The West Ham Corporation have purchased the Essex Lodge Estate, of about seven acres, at Plaistow, for the purpose of a public park.

The memorial stones of a Wesleyan chapel, in course of erection at Glasfryn, Bangor, from the designs of Mr. W. Lloyd Jones, C.E., were laid on Friday last.

St. Augustine's Church, Solihull, the rebuilding of which in 1839 was the elder Pugin's first church work, is being redecorated under the supervision of Mr. F. A. Pippet. Two statues mounted on corbels have been executed and fixed by Mr. J. Roddis, the three memorial windows to the late Canon O'Sullivan, which are in the hands of Messrs. Hardman, are expected to be completed during this month.

Intercommunication.

QUESTIONS.

[10755]—**Warmington Church, Northants.**—Could any subscriber inform me as to where I can find a description, with longitudinal section and details, of this church? I have the plan and a few details, gathered from various sources; but should like it as complete as possible.—EARLY ENGLISH.

[10796]—**English Abbeys.**—At the exam. of the R.I.B.A. in March, 1891, the following question was given:—"Describe fully and illustrate by sketches one of the English Abbeys erected during the period selected by you." I should be very much obliged to any subscriber, or any candidate who answered the above question, if they would inform me as to where I may find sufficient information, either from books, or from actual examples in the county of Kent; also if they would be good enough to give me some idea as to the extent and nature of the description and sketches.—CLOISTERS.

[10797]—**Warning Entrance Hall.**—When the entrance and kitchen are on the same floor, is it feasible and advisable to attempt to moderately warm the entrance (10ft. by 16ft.) by means of a coil of hot-water pipes worked from the kitchen boiler? The distance from the boiler would be 40ft. Particulars and any information will much oblige.—HOLDFAST.

[10798]—**Mouldings.**—I shall be glad of any information as to the best methods of obtaining the profile of deep, undercut mouldings from existing buildings!—W. R. G.

[10799]—**Size of Sewers.**—I have felt much interested in the questions and replies relating to the velocity and flow of sewage, but I have never seen a rule for finding the size of either a brick or pipe sewer when the length, inclination, and volume of flow per minute is given. For instance, when the outfall per minute (minimum flow) is 692 gallons, the length one mile, and the fall 8ft., for a brick sewer, the radius of whose invert equals a quarter of the transverse diameter; and also for a pipe sewer, both running, say, two-thirds full? I should be glad to hear of such a rule.—INVERT.

REPLIES.

[10794]—**Hydraulics.**—The factor '01745329, referred to by "X," as occurring in my reply, is the length of the arc subtending an angle of 1°, in parts of the radius, and is thus obtained:—

$$\frac{2\pi}{360} = \frac{2 \times 3.1415926536}{360} = '017453292$$

The 14.7715in. he refers to is, of course, the product of the angle BAC x radius in inches x '01745329 = the length of arc BE required. '01928 is the sine of the angle 70° 31' 44", or 70° 28' 35", as stated.—F. E. GAY, Bath.

[10775]—**Hydraulics.**—I agree with "M. A." that where it is required to find the H.M.D. of a circular pipe, running one-third full, it would simplify the calculation for finding area of wetted segment to adopt a constant 0.22917 (not, as "M. A." states, 0.2234, which appears to be partly a printer's error) obtained as follows:—

$$\frac{1}{4} \left(\frac{\pi \phi}{360} - \frac{\sin \phi}{2} \right) = \frac{1}{4} \left(\frac{3.1416 \times 141'576}{360} - \frac{.6285364}{2} \right) = 0.22917$$

Where ϕ represents the angle BAD of my sketch on page 817 equals 141'576°. This constant to be applied as "M. A." suggests. The method given by "M. A." for obtaining length of wetted perimeter is a useful approximation where the angle is not known; but, of course, in the case now specially under consideration, this, too, would be constant. Consequently the length of the arc can be worked out as quickly and more accurately (though minute accuracy is not always essential in practice) by the formula I have used, $\frac{2\pi R \phi}{360}$.—F. E. GAY, Bath.

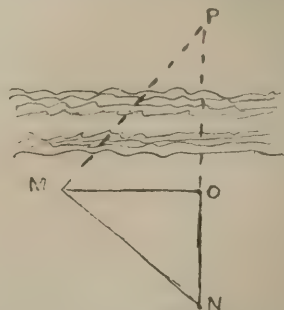
[10791].—Inaccessible Distance.—

MON and PMN are set out = 90°
OMN + ONM = 90° (Euclid I. 32)
PMN - OMN = OMP = 90° - OMN = ONM
MOP = MON = 90° (I. 13).

In the triangles PMO and MON we have proved that MOP = MON, and that OMP = ONM. ∴ MPO = OMN (I. 32), and the triangles PMO and MON are equi-angular. ∴ OP : OM :: OM : ON (VI. 4)

$$OP \cdot ON = OM^2. OP = \frac{OM^2}{ON} \text{ (Q.E.D.)}$$

In the articles on surveying this week "L. P. D." will see that the same figure is used in a different way, the advantage of which is that it is not necessary that NOM



and PMN should be right-angles, but only that they should be equal; thus rendering immaterial any error in the instrument used to set them out.—G. W. COBHAM.

Legal.

WHAT IS A "SEWER"?

"A SEWER means something that carries sewage away," so said Lord Coleridge in the Court of Appeal in the recent case of "Meader v. The West Cowes Local Board" (*Times*, June 17), and he further held that the term "sewer," as used in the Public Health Act, 1875, would not include a set of pipes which drained some houses into a cesspool. The legal point taken by the plaintiff here was really very ingenious. It appeared that he had, some eight years ago, built five pairs of houses at West Cowes, having drains at the back leading into a line of 6in. pipes. These ended in a cesspit about 4ft. by 6ft., and then a second line of pipes carried the overflow from the pit over the land of an adjoining owner to discharge it into the river Medina. This owner, however, as he had a right to do, cut off those pipes, thus causing the sewage to flow back into the pit to create a nuisance. The Local Board had frequently called upon the plaintiff to abate the nuisance by cleansing the pit, and the plaintiff then brought this action to restrain the Board from causing the nuisance, contending that the cesspit was part of an existing sewer which had vested in the Local Board itself, and which they were bound to cleanse under the Public Health Act, 1875.

Mr. Justice Chitty held that this was really a bold attempt by the plaintiff to turn the tables on the Board, against whom he had no complaint, but who had a just complaint against him. He dismissed the action with costs. Upon appeal the same result followed, and this ingenious argument failed. Still, there was something in the point that as the pipes did carry the sewage into the river, they formed a sewer of which the cesspit was a portion. There was, however, this difficulty—that taking the pipes over the adjoining owner's land without his leave or license, was really wronging him, and so could not legally rest in the Local Board, while, in fact, they had been cut off by this owner. Then the other pipes leading only to the cesspit could not form a sewer, because they did not actually carry the sewage away, but only took it to the pit and left it there. These pipes, therefore, were regarded by the Court as forming part of the drains, and not as constituting a sewer, so that the plaintiff lost his action with all costs, and will now have to cleanse his cesspit until such time as he and the Local Board can agree upon the construction of a proper sewer.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by *Tuesday* morning to insure answer same week.

LEGAL INTELLIGENCE.

A CHURCH RESTORATION DISPUTE AT UPTON BISHOP.—Dr. Tristram, Chancellor of the diocese of Hereford, held a Consistory Court recently, when an application was made for the grant of a confirmatory faculty sanctioning the alterations made in the parish church of Upton Bishop. Mr. France appeared on behalf of the applicants, the vicar, churchwardens, and parishioners, of Upton Bishop; and Mr. Kemp appeared for the opponents, the members of the late Rev. Dr. Havergal's family.—Archdeacon Stanhope stated that he regarded the alterations as a manifest improvement of the church.—Mr. T. Nicholson, diocesan architect, also considered the alterations in the light of improvements, and the Rev. Andrew Pope, vicar of Upton Bishop, supported the application. A lengthy correspondence was read from several of the opponents, protesting against the conversion of what they alleged was a memorial vestry to the late Frances Ridley Havergal into a mere organ-chamber.—Mr. William Smith, builder, Weston-under-Penyard, who carried out the alterations from Mr. Nicholson's plans, stated the vestry in question was not disturbed. The opponents asked the Chancellor not to grant this faculty, and further, to order that the vestry might be restored to its original condition and the organ removed. Mr. Arthur Pearson, architect, was one of the witnesses called for the opponents. Dr. Tristram reserved his judgment.

ALLEGED COLLUSION BETWEEN CLIENT AND ARCHITECT.—In the Queen's Bench Court on Friday the case of "Russell v. Harris" came on before Mr. Justice Denman. Mr. Lumley Smith, Q.C., appeared

for the plaintiff, and Mr. McCall, Q.C., was for the defendant, Harris, and Mr. Waggett for a Mr. Williams, an architect. Mr. Lumley Smith said the plaintiff was an engineer of Oxford-street, and the defendant, Harris, was the proprietor of a club, theatre, and swimming-bath at Bromley, Kent. The action was brought to recover £300 odd and balance due for engineering work done by plaintiff in connection with the swimming-bath. The plaintiff alleged collusion between Harris and Williams, whereby the architect refused to say the work was done to his satisfaction according to contract. The defendant, in reply, alleged the plaintiff had fraudulently done inferior work, and claimed £1,000 for damages sustained through the work not being done according to contract. Mr. Jacob Russell, the plaintiff, said he tendered for the work to be done, and his offer was accepted. Mr. Harris referred him to Williams, but Williams said he was no engineer, and left the matter entirely to the plaintiff, not going near the works during erection. Plaintiff received a plan and particulars from Williams of the well from which the water was to be pumped into the bath; but the well turned out to be quite useless, as previous mistakes had been made in sinking it, the measurements being entirely different to Williams's representations. The witness detailed the various deficiencies of the well, and said he had to put it right before he could erect the pumping machinery. The original contract was for £805, but the extra work was agreed on at £97. £600 had been paid on account, but defendant refused to pay the balance, saying the work had not been done to his architect's satisfaction. Mr. Justice Denman: The question was, who was the architect? Mr. Lumley Smith contended there was no architect at all, as Mr. Williams never acted in the present matter, though he superintended the other buildings. A letter was read from Williams to Harris acknowledging £150 for fees, and telling Harris to refer Russell to him, as Russell was not entitled to a penny more; his opinion was that the whole of the materials supplied by plaintiff were trumpery and second-hand. Witness, continuing, said Williams never gave him an opportunity of a meeting. After hearing further evidence, it was agreed between all parties that the case should be referred to Mr. Ridley, Q.C., as official referee. Mr. Waggett, for the architect, Mr. Williams, demurred to this, as he considered both Mr. Williams's private and professional character were involved. He thought, however, for the other parties' convenience he had better consent to the reference, as his lordship had intimated. The public proceedings in the case then terminated.

A MANX ENGINEERING APPEAL CASE.—Before the Appellate Division of the Manx High Court of Justice, sitting in Douglas on Saturday, Messrs. Holme and King, contractors, Liverpool, appealed against the decision of Deemster Gill. The appellants had sued the Ramsey Town Commissioners for £3,004, an amount due in respect of drainage works, and of this amount Deemster Gill disallowed £2,399, and granted an execution for £1,020. The matter was reheard on the application of Holme and King; but his Honour again decided against the appellants. The counsel for the appellants argued that the decision was against the weight of evidence, that the law upon the points raised was in favour of the claimants, and that the large amount of extra work done, and for which payment was claimed but disallowed, was the result of errors in the plans supplied by the commissioners to the claimants, and upon which the tender was made. The defence was that the claimants were not entitled to recover further than for the amount for which judgment had been given, and that the large amount claimed for extras was not recoverable. The case is not yet concluded.

IN RE W. HANCOX, BIRMINGHAM.—A meeting of the creditors of William Hancox, Upper Thomas-street, Aston, carrying on business as a builder and contractor, was held on Friday. The statement of affairs showed liabilities £495 13s. 1d.; assets, £12 4s. 8d., giving a deficiency of £483 8s. 5d. The report of the Official Receiver stated that the bankrupt commenced business without capital about 1880, in partnership with his father at King's Heath, as a builder. His business was unsuccessful, and in 1882 they went into liquidation. Subsequently bankrupt traded on his own account, and in 1887 he made a private arrangement with his creditors, paying a composition of 5s. in the pound. The present insolvency is attributed to loss on contracts, law costs, want of capital, and interest on borrowed money. At the date of the receiving order the bankrupt was in Winson Green Gaol, having been arrested under a commitment order. The Official Receiver was appointed trustee.

INTERNAL ALTERATIONS AND THE BUILDING ACT.—The coroner's jury who have been investigating the fall of a dancing academy in Holloway, by which two firemen lost their lives, completed their labours on Thursday in last week. Mr. H. H. Collins, district surveyor, said the premises were originally devised as a public-house, but were altered to serve their present purpose. The first floor, of three rooms, was made into one large apartment.

In his opinion, the cause of the accident was the failing of the central shaft, which was far too weak to carry the weight it had to bear. The shaft had been buttressed by the floor joists, and was subjected to considerable vibration caused by the use that the first floor was subjected to, and especially combined with a building that was not well built. He objected to such alterations being made without notice being given to the district surveyor, and thought an alteration in the Metropolitan Building Act should be obtained. He was informed that the whole of the alterations were carried out for £124. Mr. G. H. Carter, builder and sanitary engineer, of Torrington-avenue, Kentish Town, said he carried out the alterations to these premises; but he received no plans or instructions from an architect or surveyor, though he was led to suppose that they were to be to the satisfaction of some surveyor. He thought there ought to have been an architect. He was told the work that was to be done, and carried it out, the brickwork being sound; and he thought the shaft perfectly safe. Mr. C. B. Young, architect, of 17, Coleman-street, who inspected the premises for the builder, agreed with the report of Mr. Collins as to the cause of the accident. The jury, in returning verdicts of death from misadventure, added the following rider: "And the jurors, being persuaded that, in the present case, the collapse of the building was due to defective internal structural alterations, and having heard the evidence of experienced surveyors, desire, in the hope of averting similar calamities, to add most emphatically the expression of their opinion that the extension of the statutory powers of district surveyors is urgently called for, and that such amendments should be made in the Buildings Act as may be necessary to give the County Council and its surveyors control over all internal as well as external alterations of buildings."

WHO CALLS THE TUNE MUST PAY.—BUTLER V. PEMBER.—Mr. Baron Pollock and a special jury heard on Friday an action bearing upon the liability of churchwardens of proprietary chapels for debts incurred for repairs in those buildings. The plaintiff is a builder, and the defendant, who is a house and estate agent, acted as a churchwarden at a proprietary chapel known as Christ's Church, Carlton Hill, St. John's Wood. The plaintiff sued for a sum of £154, the cost of repairs and alterations to the church, which he said had been ordered by the defendant. It was agreed at the trial that only the question of liability should be then tried, and that if necessary the builder's account should be referred. The defence set up was that the orders were given by the defendant as agent for the incumbent, and that, therefore, the defendant was not liable. The late incumbent swore that he gave no orders except to move a font from one place to another, and he was corroborated by the then organist. The defendant said that he never contemplated paying for the repairs, but expected the plaintiff would be paid either out of the funds subscribed or out of a mortgage of the property. The learned judge warned the jury against thinking that because the plaintiff had done the work, and ought to be paid by somebody, the defendant must be liable. The jury ultimately returned a verdict in favour of the plaintiff.

RAILWAY COTTAGES AND THE BUILDING ACT.—At West London Police Court last week, the contractor to the London and South-Western Railway Company was summoned by Mr. Knightley, district surveyor of Hammersmith, for failing to give notice of the erection of certain buildings as required by the Act. Mr. C. T. Giles defended, and claimed exemption on the ground that the buildings were for the purposes of the railway. Mr. Knightley said the defendant had commenced to build on some vacant land in an irregular way in Salgrave-road, near the railway, for the occupation of the company's servants. As the buildings did not form part of the railway the company were not exempted. Mr. Plowden thought the cottages, which would be used by the company's servants, would be as much a part of the railway as a shed or any other building. He dismissed the summons, with £2 2s. costs. Mr. Knightley said that he should appeal to the London County Council.

At Tuesday's meeting of the London County Council, the Asylums Committee was authorised to provide the necessary furniture, bedding, farm stock, &c., required to equip Claybury Asylum before patients could be received, at a cost not exceeding £40,000. They were also authorised to construct farm buildings at this asylum at a cost not exceeding £25,000.

The monument to the late Canon Hannan, of St. Patrick's Catholic Church, Edinburgh, has been unveiled in the Grange Cemetery, Edinburgh. It is of Sicilian marble, about 14ft. high, and takes the form of a Celtic cross. On the back is an inscription in Latin, and on the front another in English. The cross also shows on its face a representation of the features of the Canon, as well as of a chalice and host. The work has been executed by Messrs. Gunn and Co., of Edinburgh.

Our Office Table.

THE list of Parliamentary candidates includes three architects, all of whom are, curiously enough, ranged on the Gladstonian side—Mr. Henry H. Bridgman, C.C. for the Ward of Cheap, who has come forward for Taunton; Mr. T. Chatfield Clarke for Grantham; and Mr. Banister Fletcher for Christchurch, Hants. On the other hand, of the three contractors who are seeking seats, two are Conservatives and the third a Unionist—viz., Mr. John Aird, one of the partners in the eminent firm of Lucas and Aird, who desires re-election for North Paddington, and Mr. J. T. Firbank, the railway contractor, who is put forward for Haggerston; while Sir William Arroll, the contractor for the Forth Bridge, is put forward for North Ayrshire. Mr. D. Ford Goddard, who succeeded his father, the late Mr. Ebenezer Goddard, as manager of the gasworks at Ipswich, an appointment he resigned after a few years, is the Gladstonian candidate for that borough, of which he has just resigned the Mayoralty; Dr. B. W. Richardson is standing in the Gladstonian interest for Walton, Liverpool; and Mr. John Burns is put forward in the Labour interest for Battersea.

THE latest proposal for a new street from Holborn to the Strand propounded by the Improvements Committee of the London County Council is of a more comprehensive nature than any previous ones. A straight line, 100ft. wide, is proposed to be drawn from the junction of Little Queen-street and Holborn to St. Mary's Church in the Strand, terminating behind the church with a raised terrace, from which gentle slopes will carry the traffic east and west into the Strand. The Holywell-street island is bound, of course, to be demolished. A circus is to be formed in the middle of the new thoroughfare—which it is suggested might be named the "Council Broadway"—on the line of Sardinia-street, leading into Lincoln's Inn-fields. The cost of the scheme is estimated at over two millions, and if approved by the County Council, who have postponed its consideration for three weeks, it will form a feature of next session's Parliamentary Bills.

GRAY'S INN is at last to have a new chapel. The discussion about the rooks has apparently done some good. The hideous iron erections in the gardens, which drove away the rooks from their nests and their young, were put up for classrooms, which, under the new lecture system of the four Inns of Court, were rendered necessary. Gray's Inn had no rooms to offer except its chapel, which is a four-walled flat-roofed room in which music is well-nigh impossible and ornamentation out of place. So, after a long and protracted discussion, the majority of the Benchers have secured a resolution for the building of an Elizabethan or Late Tudor chapel in the gardens. The old chapel will take the place of the offending iron structures, and become a place of legal rather than religious work. We have commented elsewhere on the extraordinary manner in which the competition for the new structure is being conducted. The question, according to the *Manchester Guardian*, was started by a Nonconforming member of the Bench (who objected to the proposal) whether the chapel had ever been consecrated. There are no records of this on the Society's books, for, of course, like the other inns, it has never recognised the Bishop of the Diocese as Ordinary, and if the Temple was consecrated it was in the days of the Knights Templars, as the Master of the Temple claims not only to be his own Ordinary, but also to walk before the Archbishop of Canterbury in the Temple itself.

THE hydraulic power in London is largely utilised. We understand that at the principal pumping-station of the Hydraulic Power Company at Holland-street, Blackfriars, there are four sets of compound pumping-engines, each of which is capable of delivering 300 gallons of water per minute into the accumulators at 750lb. pressure per square inch. The system has been doubled in four years, and there are now, it is stated by Mr. E. B. Ellington, M.I.C.E., 55 miles of street mains laid, and power supplied to 1,700 machines, lifts, &c., which required about 100,000 gallons of water to be pumped per hour. A pressure of over 700lb. per square inch is maintained.

CARDIFF is rapidly growing, and consequently

needs entirely new public buildings, and finds its existing edifices inadequate and inconveniently planned. Sites are required on which to house a new town-hall and municipal buildings, university college, technical instruction schools, Welsh intermediate schools, public baths, and a museum. The corporation have been nibbling for years at a piece of land in Quay-street which some thought would do for municipal offices, but have now abandoned it, as the price asked was too high. A scheme is on foot for purchasing Cathays Park from the Marquis of Bute (if his lordship should prove both able and willing to sell it for the purpose), and to build the whole of the much-required public institutions in the centre of the park, leaving a grass-covered open space all round. Such a bold scheme for concentrating the civic edifices would, if carried out in a liberal and far-seeing spirit, arouse a healthy public feeling in Cardiff, while the group of buildings could hardly fail to add to its dignity and appearance. The proposal would probably be less costly than a system of purchasing little plots in obscure by-streets on which to build indispensable offices, and of tinkering up old buildings to suit the hand-to-mouth requirements of the hour.

THERE is to be an International Exhibition of Building Materials at Lemberg this year, under the auspices of the Governor of Galicia. The exhibition, which will be opened on the 30th August and closed on the 20th September, 1892, will include: Stone, bricks, marble, cement, lime, timber, and iron; locksmiths' work, forged goods, metals employed in architecture, roofs, carpenters' work, glass, asphalt, waterproofs, paints, lacquers, varnish, paper-hangings, tapestry, water supply and pumping apparatus, bathing contrivances, ventilators, lighting materials, sewers, lifts, arrangements for extinguishing fire, domestic telegraphs, telephones, special arrangements chiefly of a hygienic nature, oil-cloth, carpets, &c. The executive committee meets at Lemberg. A special jury will allot State medals to the exhibitors on behalf of the Austro-Hungarian Government. Parties interested and requiring information are requested to apply without delay to Mr. Arthur Gobiet, at Karolinenthal, Prague.

Trade News.

WAGES MOVEMENTS.

THE LONDON BUILDING TRADE.—The new working rules for the whole of the building trades agreed to at the conference of masters and men, on the 10th ult., were signed on Thursday afternoon, the 23rd ult., at the offices of the Central Master Builders' Association, Bedford-street, Strand, when all parties concerned were present.

THE BIRMINGHAM BUILDING STRIKE.—SETTLEMENT OF THE DISPUTE.—The dispute in the building trade of Birmingham has at length been settled, thanks to the intervention of the stipendiary (Mr. T. M. Colmore). The bricklayers asked for the immediate increase of a halfpenny per hour, raising their wages to 9d. per hour; that the clause in the rules referring to arbitration should be waived; and that the new rule with respect to the increased wages should be signed and agreed to by both sides until, at any rate, April 1, 1894. The employers eventually conceded all the terms with the exception of the last, and were willing that the rules should be signed until April 1 next year. The stipendiary advised the men's representatives to accept the compromise, and at a general meeting of the men on strike held on Tuesday at the offices of the Bricklayers' Society in Navigation-street, Mr. J. Camm, the president of the society, presiding, it was decided to do so, and work was accordingly resumed yesterday (Thursday) morning. The strike has lasted exactly thirteen weeks, having commenced on April 1.

BOLTON.—The Bolton Master Builders' Association has resolved upon a general lock-out if the plumbers do not accept their terms or consent to arbitration. The men have been on strike eight weeks, owing to a dispute with regard to the apprenticeship rules and the allowance for lodging. On the latter point the men ask 3s., and the masters offer 2s. 6d.

BRISTOL.—During the past week the president and ex-president of the Bristol Chamber of Commerce (Messrs. J. R. Bennett and J. Dove Wilcox) have sat as arbitrators to settle differences between the builders and their labourers and plasterers, but the awards have not been announced. The bricklayers and stonemasons have sent in notices asking for an increase of wages and an alteration of rules.

Up to the present time the offer to refer this matter also to arbitration has been declined.

REDDITCH.—The strike among the bricklayers of Redditch and district has ended, the masters having conceded the demand of the men for an increase from 7d. to 7½d. in the rate of pay per hour. An arrangement has been arrived at respecting the rules submitted by both parties in the dispute. The strike had lasted three weeks.

MEETINGS FOR THE ENSUING WEEK.

SATURDAY (July 9).—Architectural Association. Third Summer visit to Colonel North's house at Eltham, and to the remains of Eltham Palace. Train leaves Cannon-street Station at 1.45 p.m. Trains return from Eltham at 6.29, 7.25, 7.52. P.O. for 1s. 6d. (this includes fare) must be sent to Edmund Woodthorpe, 1, Circus-place, E.C., on or before Wednesday, the 8th instant. Meet at Cannon-street Station about 1.30.

The Architectural Association.—July 9. Third Summer Visit to Colonel North's house at Eltham, and to Eltham Palace. 1.45 p.m. train from Cannon-street. P.O. 1s. 6d. to be sent to E. Woodthorpe, Esq., 1, Circus-place, E.C., before Wednesday, the 8th inst. ERNEST S. GALE F. T. W. GOLDSMITH } Hon. Secs.

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TENDERS.

Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

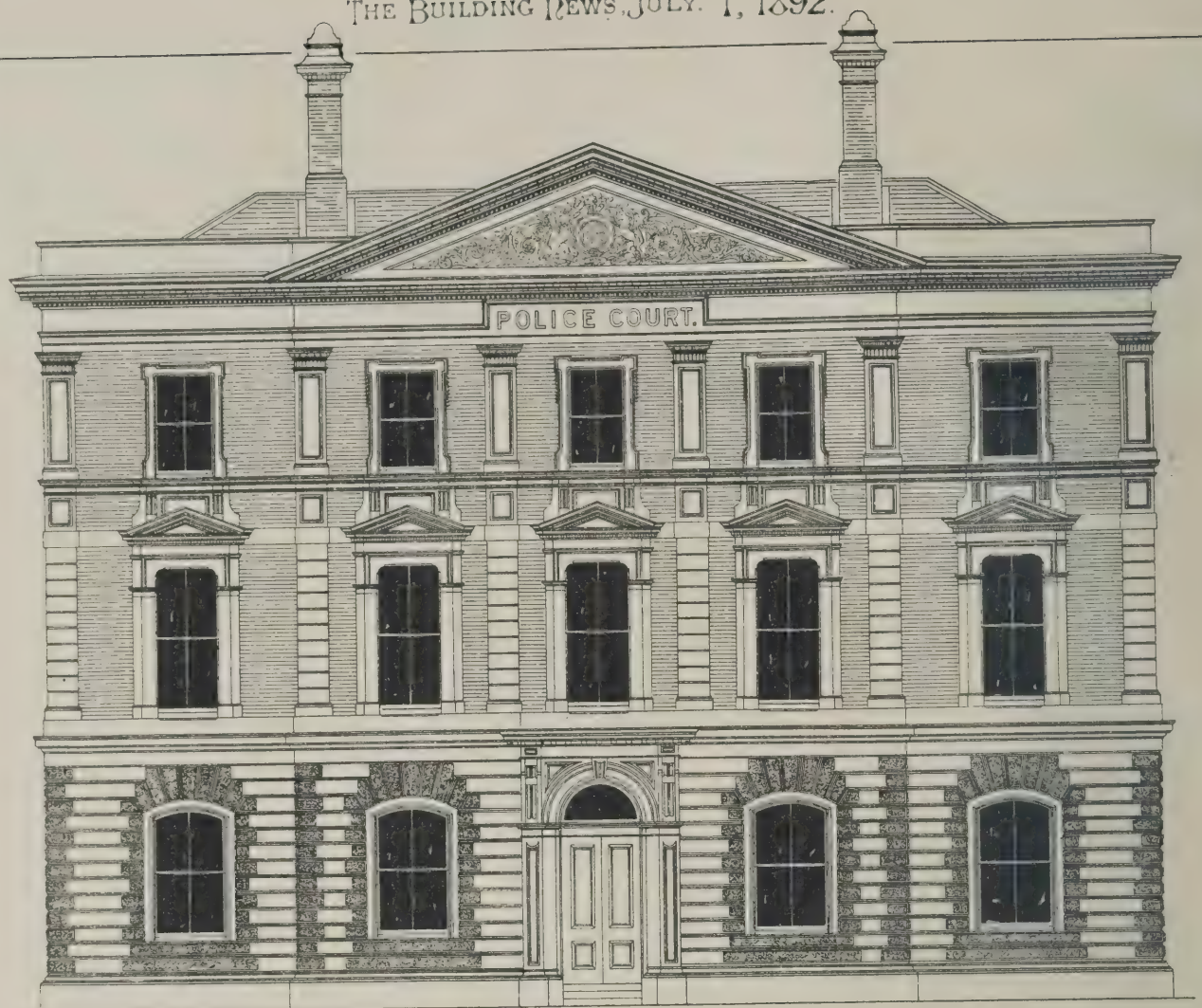
ARDLEIGH.—For the erection of stables and coach-house, for Messrs. T. Moy, Limited, Colchester. Mr. J. W. Start, F.S.I., Cup's Chambers, Colchester, architect:—

Chambers, W. A., Colchester	£379 0 0
Beaumont, R., Loxden	370 0 0
Fenn, W., Ardleigh (accepted)	247 0 0

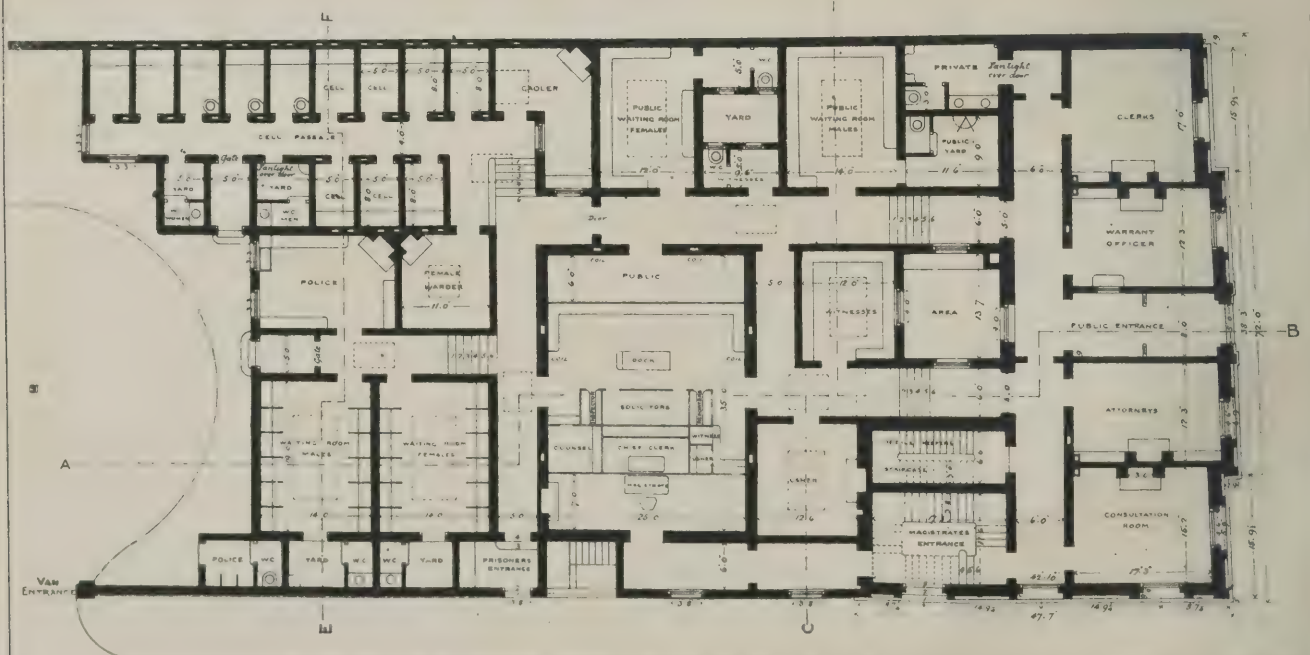
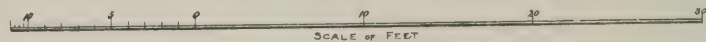
AUDENSHAW.—For sewerage, levelling, paving, kerbing, flagging, and completing Booth-road, Audenshaw, for the Audenshaw local board. Mr. J. H. Burton, Ashton-under-Lyne, surveyor:—

Worthington and Pownall, Manchester (per schedule of prices).

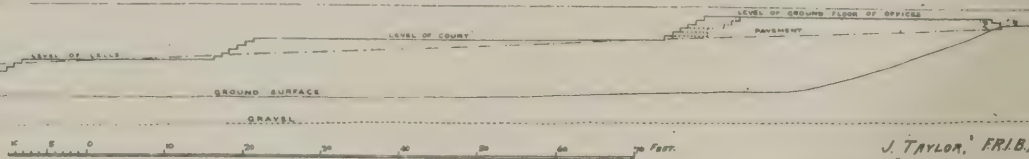
(Four tenders were received.)



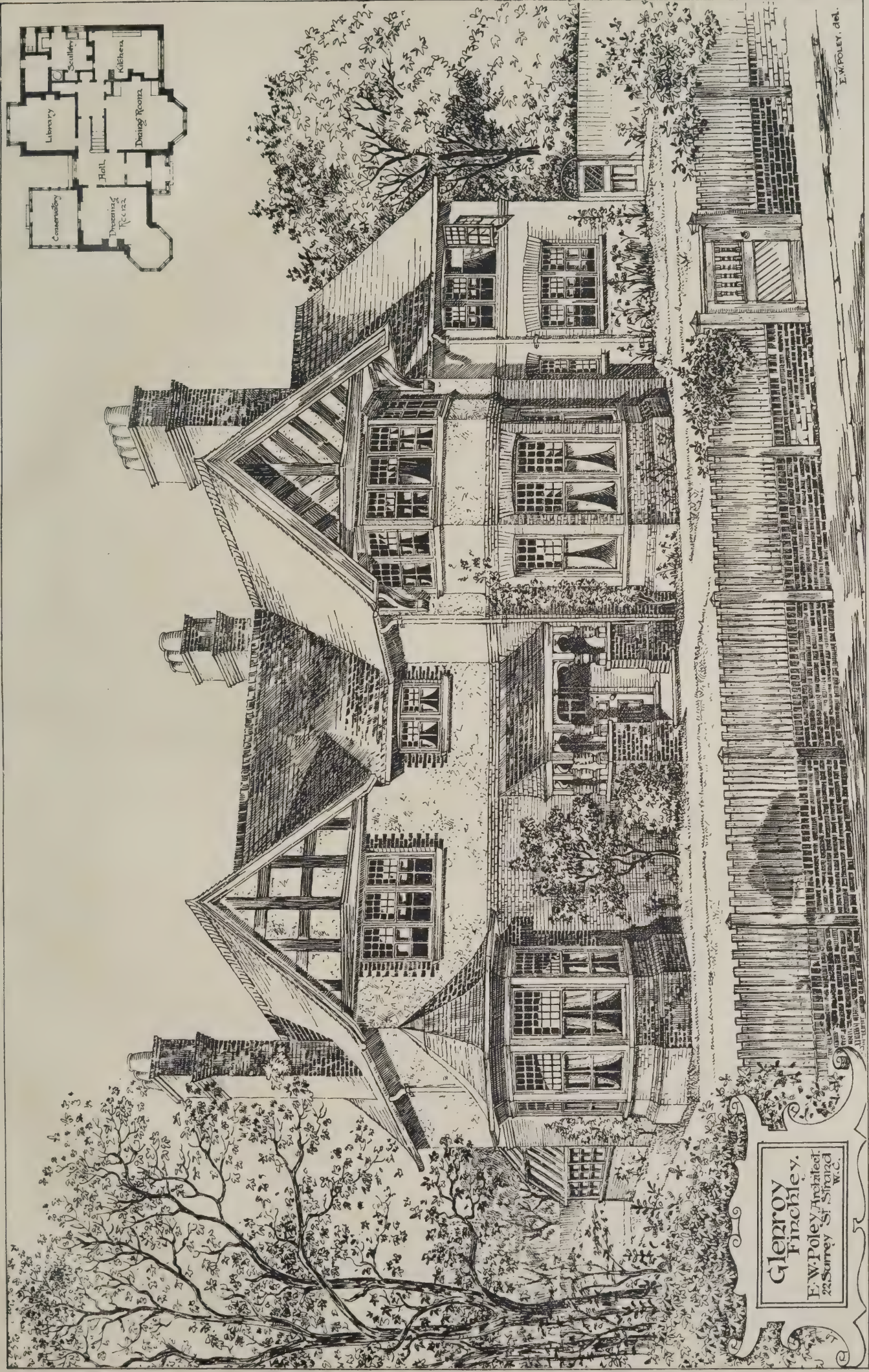
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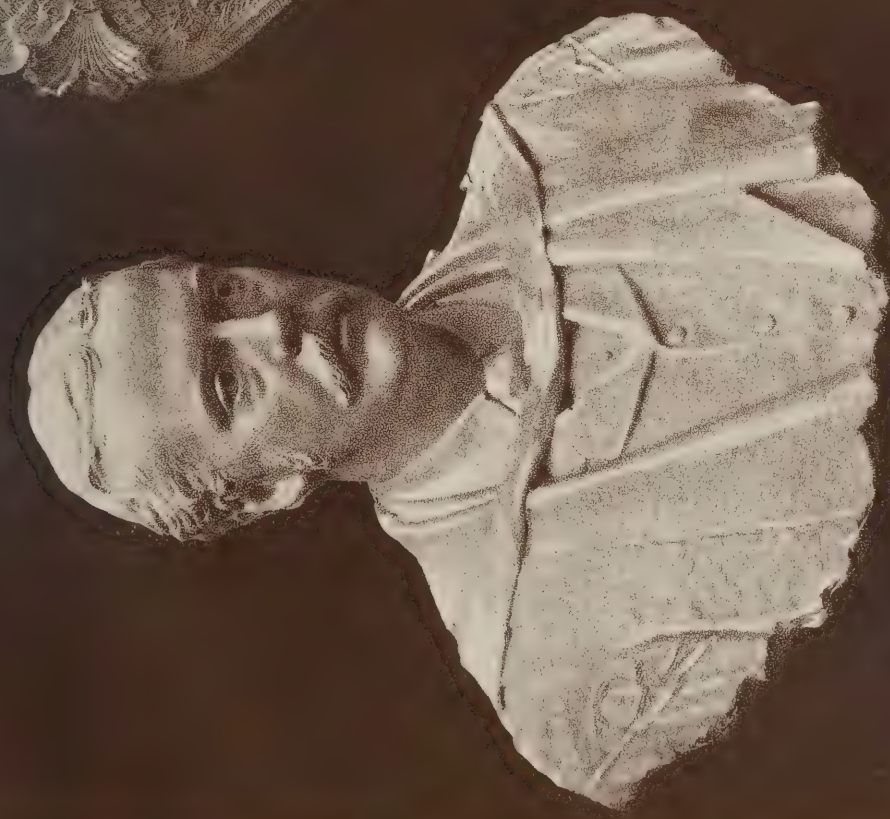


SCULPTURE AT THE ROYAL ACADEMY, 1892.



"MORNING" BY HENRY C. FEHR.

THE GORDON MEMORIAL SHIELD BY E. ONSLOW FORD A.R.A. A WOMAN BY ANDREA C. LUCCHESI.



"FAVOURITES" BY HENRY C. FEHR.

THE RT HON: A. J. BALFOUR M.P. BY E. ONSLOW FORD A.R.A.



"FATE-LED" BY ALBERT TOFT.

THE BUILDING DEWS, JULY 1, 1892.



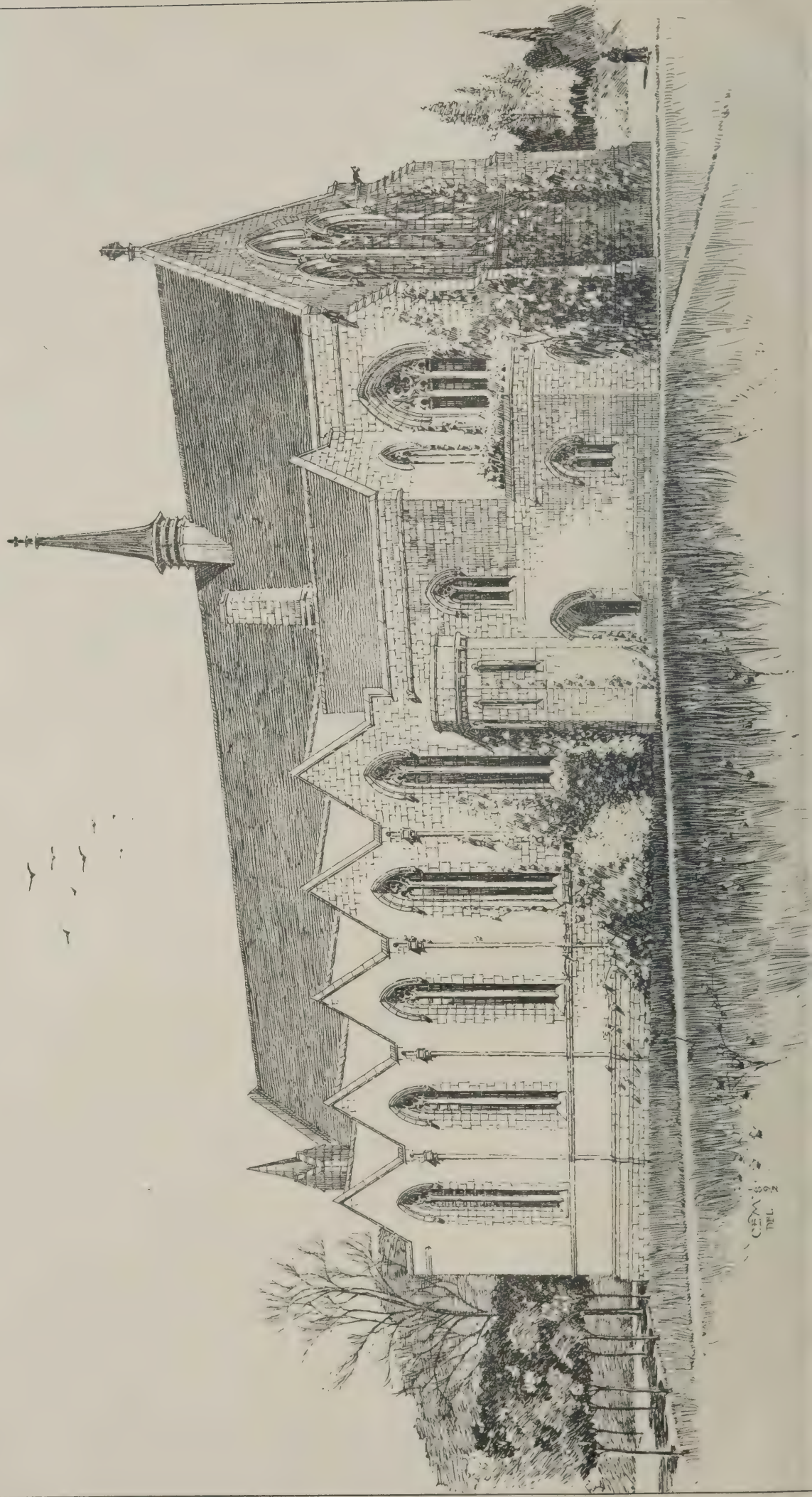
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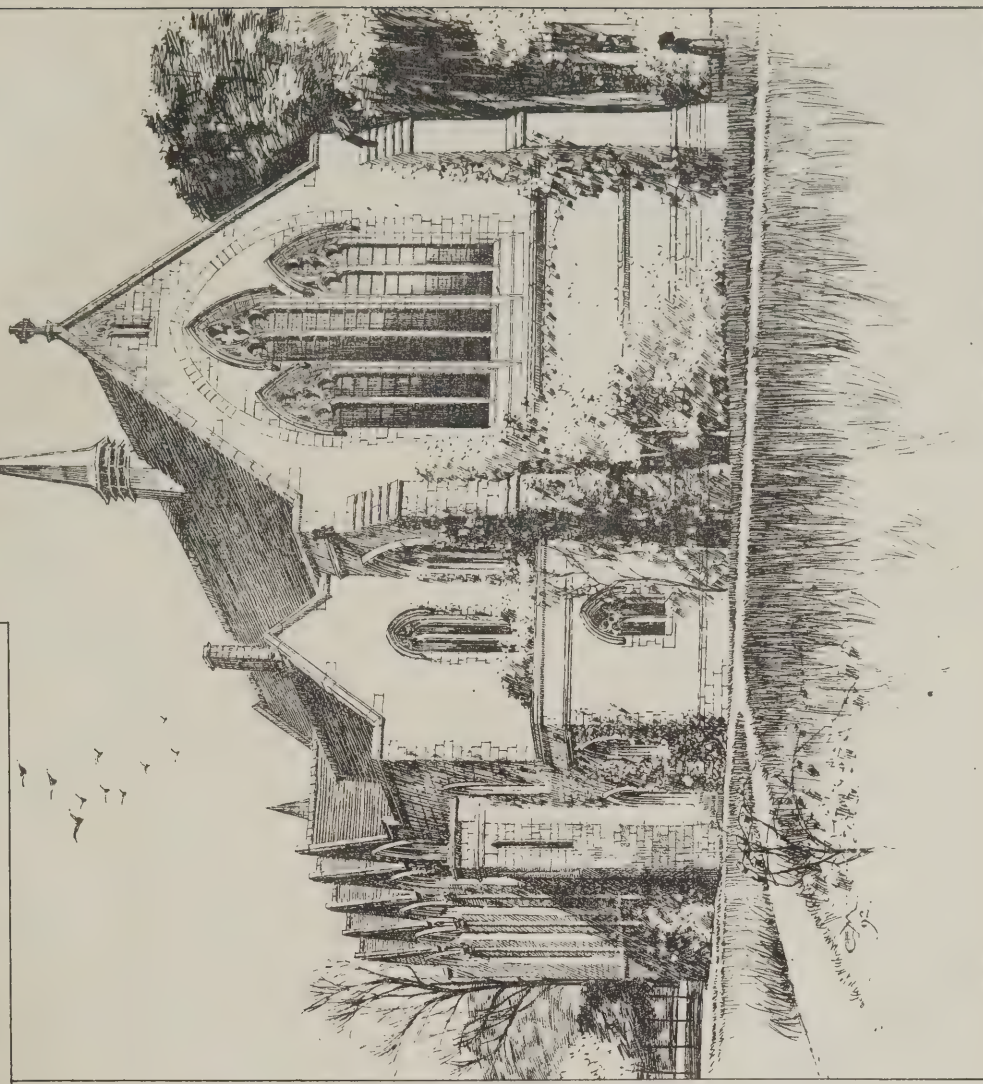
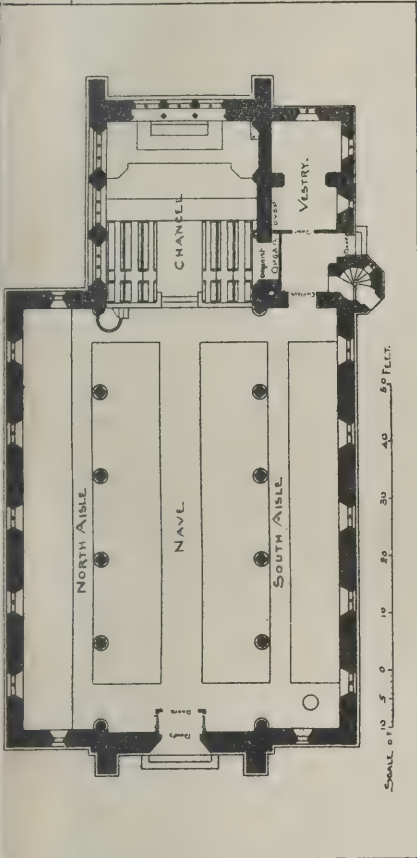


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THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1957.

FRIDAY, JULY 8, 1892.

DESIDERATA IN COMPETITIONS.

THE influence of locality and site in determining the design of a public building has been regarded with indifference by promoters and competitors alike, often owing to the little discretion that committees have in the selection of a locality. Very often it is a mere question of opportunity. Municipal authorities have not every day the chance thrown in their way of laying down a plan of a town and of deciding where their town-halls, magistrates' courts, public offices, markets, libraries and museums, and other institutions are to be placed. In many towns the corporations have no other choice than to accept or reject some vacant site or ground that may possess the advantage of abutting on a main street or be a corner plot. The ground may be irregular and have objectionable boundaries on the remaining sides, or the levels of the land may be awkward. These irregularities are unfortunately disregarded. Committees and clients imagine architects can cut their buildings to anything, no matter how crooked, and erect a handsome structure on any sort of site. Then there is neglect on both sides. Competing architects very seldom make a personal inspection of the site, and the promoters of the competition do not make it necessary that they should see it. In many recent competition instructions, the peculiarity of site has been overlooked, and those who compete have been allowed to draw their own conclusions and to make their plans, irrespective of any local considerations. Even the recent Institute "Suggestions" appear to have avoided any reference to the point. We may urge, indeed, that in all competitions for edifices on sites that are irregular special conditions should be laid down. It is only fair that each competitor should know the locality, the boundaries and their varying heights, the style of the surrounding buildings; and these matters are as important as the levels. Let us suppose that A. resides in the locality of the site, and obtains every information respecting the boundaries, the approaches, and any proposed alteration that is about to be made to them. He knows which side the main fronts of the building should be, and as he can examine the heights of surrounding buildings abutting on the site, he can prepare a design with much more certainty of a success than B., who does not know the town, or has not thought it expedient to pay a visit; or even than C., who has obtained his information second-hand, and who has been supplied with a few data about levels, &c., through the surveyor to the authority, whose printed plans and sections may not be free from error, or may be construed wrongly. A. has therefore considerable advantage over B. or C. In the preparation of his elevations and perspective he has taken into account the proximity of a building of considerable height and the ancient lights of adjoining premises, and has thereby been able to conceal or balance the one and to avoid the ill consequences of being compelled to alter the elevation or modify its height to suit the other. A. has made his main façade towards a street that will give the best perspective and be seen without obstruction, while B. and C. have fallen into the fatal error of arranging their main elevations in such a manner as will very badly unite with buildings on either side, and of placing the windows of principal rooms opposite inferior premises. Imagine, if one can, a finely-pro-

portioned tower placed alongside or near to a factory chimney, or a low wing overshadowed by a prodigious erection on one side. It would be untrue to say that A., B., and C. had a fair and equal chance in the contest. In the Sheffield and Oxford competitions this want of equality is manifest in the designs. The Oxford building site is irregular in its outline, and there is an obtuse angle at the junction of the two principal frontages in St. Aldate's-street and Blue Boar-street. Two of the competitors in the final competition have arranged their building with a square angle, which, of course, sacrificed a portion of the area. As a matter of architectural propriety, this plan is desirable; but the author of the winning design arranged the return front to follow the line of side street, and thereby scored a point which was no doubt approved by the committee as being most economical.

Now it would be saving some trouble and questioning in the minds of competitors if promoters, before they published their instructions and plan, decided this question of irregular angle, or at least suggested to the competitors the course they thought desirable, for in some instances it may be necessary to follow the boundary. Competitors would also be glad to be relieved of any responsibility on such a point, as their own preference may sometimes suggest to them a course which could not be favourable to their chances of success, and, in fact, may absolutely jeopardise the acceptance of their design. In the recent Bath municipal building competition the question of "right" or "acute" angle was raised, and no doubt entered into the consideration of the assessor in awarding the prize. Not only do the questions of boundary and angle enter deeply into the mind of architects engaged in preparing designs for large public buildings, but they exercise a material influence in the actual results. Crookedness and irregularity have spoiled many buildings executed, particularly when after some years the old premises surrounding them have been removed. What can be done to rectify the bareness and broken outline exposed to view? The want of rectangularity destroys the perspective of the main fronts, the deviation of the axes of the principal blocks, cut awkwardly in the lines of roofs; every feature looks disturbed, as if some twist of the site had caused the buildings to appear awry. Internally, the rooms and corridors and halls are crooked, or bent to suit the angles, much to the lack of equanimity of mind and eye. There is an erratic and capricious appearance sadly destructive to all decorative effect. Surely these things are as much a matter for decision beforehand as the conditions of cost and accommodation? Equally important becomes the question of character of the surrounding buildings, which is also left to the designer. A completely prepared set of instructions ought to describe the local character of the buildings or landscape. The style of the adjoining edifices, if there are any of particular mark, and the surrounding streets and approaches, ought to be described and shown on plan. A hilly background from the higher levels of which the proposed building may be seen, or a declivity of the ground in front, are vital conditions. If, for instance, from a street in the immediate vicinity the eye will be able to obtain a partially bird's-eye view of the edifice, how supremely ridiculous would be buildings planned on irregular axes, or flat roofs with high parapets towards the main streets. In such a case considerable care is necessary in grouping the blocks and in designing the roofs and inner quadrangles. Then we are accustomed to see domical features and towers placed in such a position that they cannot be seen from a declivitous approach to the building, not having been designed

high enough. The levels not only of the immediate streets and approaches ought to be furnished, but the point of view both in respect of position on plan and height of the eye in relation to the main fronts. For instance, the practicable level of the eye or "horizontal line" may be not higher than the ground level of the building or some feet below it, so that all tall features within the area ought to be heightened. On the other hand, it may be so high up, if the building site lies in a valley or a depression of the ground, that greater altitude in the elevations, or more regard to the upper features may be required to render the edifice of sufficient importance. These are matters usually left to the unwary competitor. If he takes the trouble to inform himself by a personal visit to the locality, all may be well; but if he depends on the written instructions as they are given him, he may find that he is very far from having interpreted the instructions aright, while laying a flattering unction to his soul as to the merits of his labours. The points we have considered are as much conditions of a properly conducted competition as any of those other requirements which are thought to be absolutely essential.

THE ROYAL SOCIETY OF BRITISH ARTISTS.

THE special exhibition of oil and water-colour paintings now to be seen in the Suffolk-street Galleries is intended to commemorate the seventieth anniversary of the foundation of the society. Many of the members have voluntarily contributed pictures, and the addition of other works render the collection both interesting and representative. In the large gallery are to be seen several more or less important canvases by Sir John Gilbert, R.A., Dudley Hardy, E. Burne-Jones, A.R.A., P. H. Calderon, R.A., Anderson Hague, T. B. Hardy, and others. "The Return of the Victors," by Sir John Gilbert, R.A. (29), is a large and characteristic composition by this master of historic and legendary subjects. The procession of armour-clad knights on their steeds, with their banners and trophies of victory, and the ladies walking abreast with flowers and wreaths, trumpeters leading the way, make a gorgeous composition in which the invention and picturesque qualities of this painter of warriors and historic incident are seen in their best. Sir John's power as a depicter of the pomp and circumstance of war, is here undoubted, and he can better than most men paint masses and groups of warriors and horsemen, and impart poetry and action to the figures. In the corner of room (63), the soldier on his charger, banner in hand, urging onward his followers, is bold and full of action; while "Fair St. George" (69) is a legend which, in the hands of this veteran master, has been painted with a sense of picturesqueness and colour never surpassed. The painter probably here depicts the incident as recorded in a well-known ballad in Percy's "Reliques." The dragon has been killed, and "Fair St. George" holds the monster round the neck by a ribbon. Both the Red Cross Knight and the fair maiden are represented. At the corner of large room, one of the painter's well-known Shakesperian incidents is exhibited, "Ege et Rex Meus" (76), Henry VIII. leaning on Cardinal Wolsey's shoulder—a scene in the 1st Act of "Henry VIII." The Cardinal, with scarlet robes and cassock, is a notable and well-painted figure in this picture. Next we pass to F. H. A. Parker's picture of "Cupid and Psyche" (34), a darkened chamber with a reposing Cupid, over whom Psyche stands holding a lamp, graceful in composition and clever in treatment of light. H. T. Schäfer's "The Old Capstan" (36) is feelingly painted. E.

Burne-Jones, A.R.A., whose works adorn these walls, contributes one of his finest conceptions. "The Painter's Daughter," a very sweet and beneficent face, behind whose head is a circular mirror which reflects, while it gives a halo-like effect. The figure, clad in a deep blue close-fitting dress, the hands together on her lap, is in keeping with the spiritualised conception of the wistful-eyed face. The imagination and colour are both poetical and refined. Vigorous is W. H. Pike's "Jacobite Toast." G. S. Walter's "Sunrise on the Medway" (45); J. A. Lomax's small cabinet, "The Pith of the Argument," an 18th-century dining-room scene; P. H. Calderon's "Hagar," a picture well known to visitors at a recent Academy exhibition, and W. H. Y. Titcomb's clever interior scene, "Primitive Methodists" (57), in a chapel during prayer, are among the principal pictures. A very colossal picture of grey tone occupies the place of honour of this gallery. It is by Dudley Hardy, and represents "Trafalgar Square in 1887," when it became a refuge for foreigners of all nationalities. The painter shows the Square at night-time, or early morning, the grey damp mists hanging over the scene, above which loom the cupolas of the National Gallery. In all conceivable attitudes, men and women are huddled together for warmth and shelter, some asleep, others reclining with bandaged limbs, seeking relief round the base of one of the pedestals of Nelson's column. The scene is one of misery and desolation. The wet pavement reflecting the dim light, the careworn and emaciated faces and forms of men and women, present, with pitiless realism, the sufferings of the homeless on that hapless occasion. Mr. Dudley Hardy, in his great picture "Sans Asile," has powerfully painted, though not exaggerated, the sufferings of that mass of shelterless humanity, and his picture received well-merited encomiums from our French neighbours when it hung in the Salon. The composition is happily balanced by the single figure of a young woman leaning against the corner of the pedestal. Anderson Hague's rich autumnal landscape (72); A. Glendenning's "Edge of the Heath" (79), in a low key of colour; T. B. Hardy's large water-colour (87); and Edgar Bundy's "The Best of Good Cheer," a study of a friar (93), are other pictures of interest.

The north-west gallery contains two other of the last painter's clever pictures, "Studious Companions," a friar and his cat, admirable in its treatment and colour (1), and an interior in which the figures of lady and cavalier are painted with knowledge of 16th-century details. The portraits by G. F. Watts, R.A., of the Marquis of Salisbury and the late Robert Browning, the last a side face, are painted with much characterisation; also a good portrait of William Morris (5). That of Mr. Wyke Bayliss is, to our mind, a less satisfactory portrait, though the light and colouring are well managed. An idealistic study by E. Burne-Jones, "The Moon," is a decorative treatment in blue of much grace of line and beauty. A masterly picture is by Arnold Priestman, a moorland hillside, the brown hill and clouds forcibly painted. Sir F. Leighton, P.R.A., sends five very beautiful studies of pictures painted for the Academy. The "Garden of Hesperides," "Phryne at the Bath," "At the Fountain," "Perseus and Andromeda," and "Bacchante," are here, and as colour and composition sketches they are valuable contributions. J. L. Pickering has two works, "The Edge of the Common" and "February," the latter a large, luminous, and broadly-painted homestead and meadows (21); and we also notice W. Harding Smith's clever "Tomb of Rahere in St. Bartholomew's Church"; a fine landscape, a hillside with sheep under evening light, by A. Hartley;

"Evening" (19), and a strongly-painted "Hillside" (22), by J. Olsson. J. S. Noble has a few fine animal pictures. "The Village Smithy" is a splendid study of a cart-horse, mule, and dog awaiting the operation of shoeing; and "Old Veterans" (140), a group of hounds, is full of character. "Nature's Floral Carpet," by W. S. Jay (101), is a forest scene with leafless trees and primroses; next to it J. Olsson has a luminous seascape, the waves breaking on a sandy beach; O. Rickatson "A Hampshire Mill" (106) is rich in colour. A strong and vigorous landscape is sent by Anderson Hague, and an exceedingly beautiful woodland by A. Kinsley (110) delicate in its colour and blendings of foliage. Horace H. Cauty's "Scandal" (108) is brilliant and clever. In the S.W. gallery, H. T. Schäfer has a solidly-painted darkened interior, dimly lighted by a lamp, where an old money-lender has on a table bags of gold, and, with half-frightened look, staggers as he hears a sound—a hand is seen between the folds of a dark curtain. The subject is powerfully painted. Dudley Hardy's "A La Foire" (128), A. Ludovici's "Dolly"; J. Herbert Snell's "In Chancery," a fine grey view of a park with its dismantled and desolated garden (138); W. H. Y. Titcomb's "Gull Nesting" (141), and a freshly-coloured harbour view of "Staithes, Yorkshire," by V. P. Yglesias (139), are among the pictures of merit.

In the N.W. gallery the president, Wyke Bayliss, has a grand interior view of Amiens Cathedral looking across the transept, painted with all the subtle charms of perspective and colour, and light and shade which such an interior can give. The procession of scarlet-robed priests, and acolytes with banners and incense make an impressive picture. His other interior view of Orvieto Cathedral (177) is most delicate in its colour, and the Romanesque arcades, with their bands of coloured marble and details, are drawn with admirable feeling. St. Madeleine, Troyes, is another fine drawing (196). Other water colours include a view of a hamlet by W. Follen Bishop (146) of much beauty and delicacy of drawing and colour, two finely painted landscapes by Bernard Evans (159 and 164) in the South of France, some studies of heads and draperies in chalk and pencil by E. Burne-Jones; an idealised figure study, "Summer Rain," by H. T. Schäfer (186), and charming colour drawings by W. Harding Smith, one the shrine of St. Alban in St. Alban's Abbey (199); and other works by the late W. Collingwood Smith, J. Fullwood (208), and Leopold Rivers (213) are among the collection.

STABILITY OF WALLS ON SOILS.—I.

THE engineer's watchword of stability is to "keep the resultant of pressures within the middle third"; but the architect's is to "keep it precisely central" (he admits of no such deviation). The engineer and the architect, however, have each different systems of utilities imposed upon them. Thus the engineer provides for stability of his structures under moving massive loads, which deviate the position of the resultants of pressures. The architect, while having also to provide for a needful degree of stability, must likewise provide for the various requirements of domestic or civil occupation, as well as stately and agreeable appearance according to conventional or other canons of artistic taste and architectural treatment.

Now, preceding all tangible evidences of design in the order of development of a structure from its conception—that is, preceding the realisation by either the engineer or the architect of the great objects of the exercise of his profession—there must not only be the creation of a mental design of the structure in all its parts, but also of all the details of the possibilities of its practical execution; for neither can build his structures wholly in mid-air, though some may rear up high into it, yet they must be founded upon rock, either in its solid or its

disintegrated form. Our present inquiry will, therefore, begin with the primary requirements of all buildings—the stability of their foundations. This will be viewed with special reference to some neglected conditions in foundation practice and wall stability, with appropriate consideration of the isolation of static pier foundations in compressible soils, as affecting fenestrated walls.

Mutual Alliance of Engineer and Architect.—The extensive range of requirements of modern commercial and other buildings, involving many intricate engineering problems in varying forms in each building, has induced the association of the engineer with the architect in devising improved details of the structural design, resulting in enhancing the economy of stability and in effecting facility of safe construction by a more scientific treatment of the problems involved. In Chicago, New York, Boston, and other American cities the architects in most extensive practice have constituted an engineering department in their office establishments, presided over by a competent engineer, with a trained staff; other prominent architects have in alliance their appointed consulting engineers, who attend to the engineering requirements of their practice.

Reciprocity of Good Offices.—But while the architect has thus deferred his structural problems to the engineer, the engineer has not reciprocated to an equal extent in affording architects the opportunity of artistically treating their structures, and hence many of the railway terminal buildings in our cities show a decided lack of architectural treatment, which is much to be regretted. Perhaps we are not to attribute this unfortunate state of things solely to the reluctance of the engineer to have in requisition the services of the architect; but whatever be the influencing causes, they ought not to be allowed to operate any longer to the detriment of the display of architecture in this respect in our cities. For, say and think what we may, an ungainly building sheds some baneful influence upon its beholders in one form or other; and, on the other hand, a building that skillfully embodies a refinement of artistic treatment is "a thing of beauty and a joy for ever" to every beholder. Some of the class of buildings alluded to occupy prominent sites.

Static Action of Walls upon Soils.—The stability of walls depends not only upon the stability of the foundation soils upon which they are built, but also upon the conditions which regulate the action of walls upon compressible soils being such as tend to promote static equilibrium of the forces and reactions concerned. The conditions which are involved in the static action and reaction of these forces will here be considered.

Continuous-width Foundations under Voids and Solids alike are Unscientific.—The evidences of a prevalence of this practice in the wrong distribution of the wall-bases of foundations, giving equal bearings upon the soil to voids and solids in fenestrated walls, are to be seen on all hands, not only in the Metropolitan area and suburbs, but likewise throughout the provinces.

The Faults thereby Induced.—The evil and unsightly consequences of this wrong practice when dealing with compressible soils in producing unequal fenestrated wall settlements with lateral, vertical, and transverse deformations are no doubt familiar to all, but perhaps not sufficiently appreciated as regards their consequences to the domestic health and comfort of the household. Much of these consequences cannot be estimated in L. s. d., but what is of immediate concern to the inmates is often of a more vital value. The constant worry, annoyance, and inconvenience, as well as the practical discomforts of intolerable draughts afflicting a household, caused by ill-fitting, deformed doors, windows, shutters, locks, and fastenings have sometimes far-reaching effects. Windows, doors, and shutters which, when "closed," are separated from their frames at top and bottom by perhaps $\frac{1}{4}$ in. or larger void at one side, caused by unequal settlements producing distortion of the frame, forming apertures which cannot be closed, are frequently to be seen, especially in old houses; likewise floors uneven and sadly out of level, and separated from the walls, skirtings, &c. The walls and partitions are twisted, cracked, and fissured, the ceilings with cracked and falling plaster. The architraves and other finish, the strings, belt-courses, sills, plinths, cornices, and stone dressings, all are cracked, bowed or bulged, and violently out of level at different points, and otherwise distorted, hori-

zonally as well as vertically. The transoms between horizontal tiers of voids or spandrels, arches, &c., and the piers are more or less fissured or shattered, and the whole building more or less "pulled to pieces." Where houses have been pulled down it will be observed that those which remain standing have, in many instances, their front or back walls, or both, separated almost their whole height from the cross-walls by a continuous fissure of a $\frac{1}{2}$ in. to 1 in. in width. This indicates that there have

exemplified by the resistance of pinnacle loads to the horizontal thrust of flying buttresses, vaultings, &c.

In calling attention to the examples of consequences of faulty footing design, our object is to avoid giving invidious prominence to their designers, and only to point out the positions and modes of occurrence of the internal disfigurements; hence reference to recent buildings in which these faults are prominent is omitted.

The first figure (Fig. 1) shows very clearly a grave fault, and the mode of its occurrence is not less evident. It arises from the difference of reactions of the underlying soil due to the difference of loading the footings underneath the voids, and solid piers, which likewise support the arch with the spandrel, &c., above it. Then drawing perpendiculars, arrow r , on the centre of the plane of reaction of the soil on the footings, and likewise P from the common or resultant centre of gravity g of the loads of walling, &c., on either side of the void, the perpendicular distance apart of the points P or of these intersections gives the leverage of the moment of the static couple which accomplishes the disturbance. The result is shown in the convex curvature of the horizontal lines of the window sill, plinth, &c., and also in the fissures occurring in the spandrels above and below the window. In tall, narrow buildings in which the centre of gravity is high up, a very slight depression of the outside end of the footing produces a corresponding exaggerated movement outward of the centre of gravity of the wall as indicated by the outward radial dotted line. The old Lincoln's Inn gateway, Chancery-lane, is a prominent example of this unequal loading upon the continuous footing base. St. Stephen's Church, Coleman-street, E.C., is another prominent example of this fault. The arrows indicate the direction of the action of the static forces in all the figures.

This static couple action is also an exemplification of the similar static action which occurs in fenestrated walls in which all the solid wall above the lowest void forming the "bay" receives abutting support from the continuous vertical solid wall, a static pier between the vertical tiers of voids. The footing underneath the tier of voids only supports a portion of the wall underneath the lowest void, corresponding to the tympanum of the natural masonry arch. (See discussion under "Natural Masonry Arch" further on.)

Bay Windows.—The next two, Figs. 2 and 3, show faults arising from different causes, or, rather, modes of occurrence. Fig. 2.—The bay window in the recent building from which this example is taken is six stories high, and faced with stone. Two iron column mullions are introduced to intercept light as little as possible in the basement story. These support the upper stories. They are placed so that the mullioned window-frame is set inside them, and are thus necessarily placed eccentrically upon the outer third of the usual form of footing base of the low foundation wall underneath, and thus a static couple is created transversely of the wall on the plane of the soil upon the footing base, producing by unequal settlement a tilting out of the foundations, resulting in rupture of the spandrels between voids, displaying the cracks indicated.

The Oriel (Fig. 3), on the other hand, shows the effect of a lower story pier acting as a mullion only, and thereby also creating a static couple longitudinally of the wall. Observe that the abutments support the portion of the upper two stories which are placed over the lower pier mullions, so that thus the abutments support six stories besides the ceiling to the top story, also the main cornice and roof which surmount the position of the oriel, while the pier mullions only support three stories, including the oriel structure. The upward thrust of the lightly loaded piers produced by the reaction of the soil is indicated by arrows. The result is a crack in the stone lintel over the left window.

A Venetian Window, over a pair of windows (Fig. 4) in the lower of five stories, has a similar effect to the oriel, but in an intensified form, for in the building alluded to, the abutment supports five plus three and a half stories (counting the floor of the ground story as half a story), while the mullion-pier only supports the basement story and the floor of the ground story. The oblique fissures branching upwards from the pier indicate the upward thrust (denoted by arrows) produced by the surplus reaction of the lightly loaded soil. The window sill is bowed or

cracked, and the whole front of the house deformed.

Note.—Some have attempted to remedy the upward thrust (in Figs. 3 and 4), and similar cases, involving the same static principle, by introducing an inverted arch between the abutments; but this only caused worse consequences, resulting like Fig. 1. A proper arch would have had the desired effect if the footings underneath the void had been omitted.

(To be continued.)

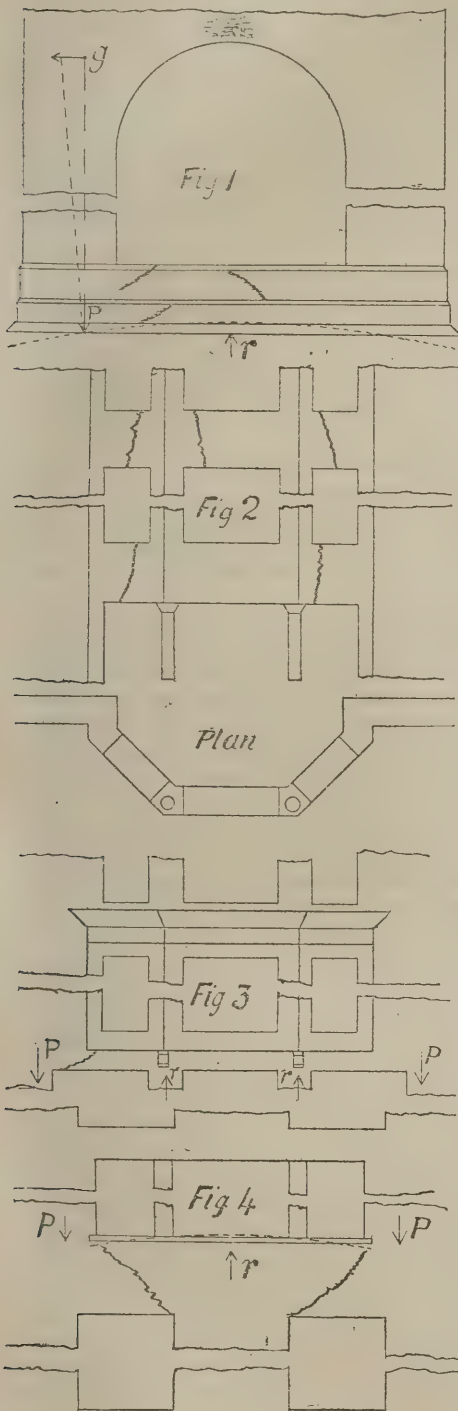
FILTERING WATER.—III.

AMONGST other materials tried to effectively remove impurities from water, as animal carbon does, were pounded coke, which is another form of carbon, also finely-powdered shells; but neither had the desired effect. Either of these materials can be used in place of sand, and there is just the possibility that coke dust would act just as effectively as a strainer, and even remove smaller particles than sand would. Sand, however, is so easily and cheaply obtained, and coke dust is so little (if any) better, that this latter material is rarely used.

The attempts that have been made to improve upon animal carbon have been with the object of discovering something that will not only remove all impurities (and particularly those that sand will not deal with); but will also further deal with them and bring about their destruction, or at least render them inert and harmless. This is, of course, a result so excellent that it raises a doubt whether it can possibly be attained. With animal carbon the result is to simply store up the objectionable matter, and, as some say, to really promote worse features in this collection. With the attempts that have been made, substances are being used that are, we might say, antagonistic to organic impurities, and the two cannot exist together. It is generally acknowledged that if a free supply of air or free oxygen could be introduced to the impure matter collected in a filter, a considerable change in its condition would be effected. The union of oxygen with the matter goes to convert it into a harmless gas, or in other words the foul material is used up, a species of combustion taking place (but without any of the customary noticeable results that we get from a fire).

The first material of this kind worthy of notice is "Manganous Carbon." This material has been taken up by Messrs. Doulton and Co., and is used by them in the various forms of filters they make. It is a substance that bears an excellent reputation in many ways. As the name implies, this material consists of animal carbon and manganese; but the two are so treated and combined as to nearly represent a new compound. The carbon is recarbonised with manganese dioxide, so that the latter becomes thoroughly incorporated with the former; otherwise the results would not be so satisfactory. Manganese dioxide, or black manganese, as it is sometimes called, is exceedingly rich in oxygen, and furthermore, should it be robbed of this gas and reduced to a lower oxide, it readily re-absorbs any that is afterwards brought within its influence. The action that takes place is therefore the oxidising or consuming of impurities, using some proportion of its oxygen in so doing, and then replenishing itself at the first available moment from air or any oxygen-bearing substance that comes near it. The makers of these filters claim that, unlike ordinary animal carbon which acts with its maximum power at first and gradually decreases in efficiency, manganous carbon really increases in power for some time, then continues for a considerable period in a normal state. An experimental filter given daily use with ordinary water was found after two years to be fit for further service without special treatment. It is, however, to be supposed that by ordinary water is meant a London Water Company's water, which should not yield abundantly of contaminating matter. This material can be had in two or three forms of cistern filters.

The Spongy Iron Filter Company, as the name implies, utilise iron which has by process been brought to a porous state, something like sponge, but without the elasticity of this latter material. With this substance, as with manganous carbon, it is the oxygen-bearing properties of the iron that is relied upon; the using up of the impurities reducing the oxide (peroxide), but which revives itself from oxygen that comes



been violent opposing forces in operation to produce such a complete dislocation of the walls.

Many of the cases of ruptured segmental arches over doorways, which abut upon slender engaged abutments—or, rather, upon cross-wall ends—are not due to the abutting thrust of the arch so much as to the horizontal component thrust excited by the radial action of the static couple created by the superfluous foundation underneath the doorway void, which tends to tilt the pier outwardly, and thus spread the arch.

This radial action of the static couple likewise neutralises the resistance induced by the superstructural load upon the abutments, the resistance of which to horizontal thrust is simply

within its influence from other sources. By this means the purifying action of the filtering material is lengthened very considerably. Theoretically, we might consider that it would go on for ever, but this is not strictly correct. There are impurities that even this material cannot deal with so far as to destroy, but which go to choke up the filter in time. The grit or earthy matter that renders some waters turbid if passed direct to the filter would go to choke its pores. This, of course, is only pointed out to show that all filters require to be subjected to some sort of cleaning process from time to time. The cleaning of cistern filters of these kinds is, however, less trouble than with those using plain carbon, as will be explained directly.

In addition to the spongy iron used in this filter, there is introduced another material called pyrolusite. This is really black oxide of manganese, the useful action of which, but in a different form, has been given. The water is first made to pass through the spongy iron, then through the pyrolusite. With large cistern filters the two materials are used (as shown by the makers) quite distinctly in separate cisterns. This filter is claimed to be specially efficacious in dealing with water which conveys zymotic diseases, bacteria, &c., in times of epidemics.

Another modified form of animal charcoal is silicated carbon. This is the material advocated and used by the Silicated Carbon Filter Company. The utility of combining silica with carbon is not at first apparent, but it is claimed by the makers that development of low forms of life, which is attributed to the plain carbon, is wholly disposed of. A somewhat well-known authority writing on the subject attributes an energetic oxidising process to this material, so that impurities undergo a chemical change and become harmless. It is a material very efficacious when used for the filtration of waters containing metallic poisons in solution.

Another modified form of carbon is carbo-calcis, the material used by Maignen's (Limited). This is carbon treated with lime, as the name implies. It is not within the province of these papers to speak more favourably of one material than another: the brief information given is almost as it is furnished by the makers' lists, and the reader must judge for himself. All the different substances named are spoken well of by different people who have used them, but Maignen certainly makes a clever filter so far as construction is concerned. Carbo-calcis is claimed to be capable of oxidising impurities and rendering them harmless; but, unlike others, this firm recommends not only the cleaning of the filtering medium, but its actual renewal periodically. To remove any objections to this arrangement easy access is provided; but what is also necessary—the renewal charges are inexpensive. The particular features in this filter are an asbestos cloth; then some exceedingly fine material deposited on the asbestos cloth by being mixed in the first water that is poured in; then the rest of the space is filled in with granular material. This filter, like most others of modern design, has provision for aeration and preventing the flat taste noticeable with water that has passed through some of the old forms of filters. This filter deals effectively with organic or inorganic impurities or metallic elements.

This is all that need be said of different substances and their peculiarities. In omitting to mention others, it is not with the idea of depreciating their value or utility. There is a firm called the Continuous Filter Company, whose motto is "Always filtering, always cleansing," by which it is gathered that the filtering medium is to be self-cleansing, dealing with the impurities, rendering them innocuous, and (they then being probably in a gaseous state) allowing them to escape. This firm informed the writer that their experiments were not fully complete, but highly satisfactory, and upon the verge of being perfect.

There are a few final features worthy of mention in regard to filters generally. Firstly, the cleansing of cistern filters. With those of modern make, and which do not use the ordinary animal charcoal, it is considered that reversing the flow of water through them suffices to remove those impurities which the filtering material has been incapable of acting upon, and certainly this arrangement, judging by the quantity of dirt that is sometimes washed out, seems effective. In doing this it is necessary to take the filter from the cistern, or wherever it is situated, and

just connect it to a pipe that will send water through it at pressure. The writer generally endeavours by some means to have them connected with a water company's mains if possible, as a high pressure is very generally obtained from this source. This, however, should not be depended upon for all time. It is not desirable to let filters even of these kinds go more than the first year without special treatment. It may not need it; but if, after one year's service, it is sent to the makers, they will (if requested) report upon its state and suggest the proper periods, judging, of course, by the state of the filter after the first year's use.

If it is proposed to buy a cistern filter from a maker, it is a good plan to submit a sample of the water to them. They can make various simple tests sufficient to advise you regarding the cleansing. Some makers issue a few simple rules and tests in their catalogues, by which the condition of a water may be arrived at with a fair degree of certainty. Other filter-makers sell small and inexpensive cases of materials and appliances, by which anyone can most simply test water for different kinds of impurities. These are especially useful in cases where water is suspected of contamination due to its having contact with certain metals or to other causes. A very useful and simple test of the purity of water can be made with Condry's fluid. If a small quantity of this be put in water, and the solution allowed to stand for, say, eight to twelve hours, its colour will determine whether the water is free from impurities or not. In the former case the fluid retains the same colour as when first mixed. In the latter case it will assume a yellowish-brown tint. The proper quantity of Condry's fluid is when it colours the water pink. It is best observed if the solution is placed in a bottle; but the bottles should be perfectly clean. It would be well to rinse out the bottom and wash the cork with some of the fluid beforehand. This material is also a capital thing to test a filter with, as to its being sound and allowing no water to pass through unfiltered. If there are unsound places, the colour of the solution will not have wholly disappeared. If the water which comes through is coloured at all, the filter is imperfect. The proportions to be mixed for this purpose is a full tablespoonful of Condry's fluid to each gallon of water.

In nearly every maker's list there appear filters that are described as being suitable for having the water pass through them under pressure. The writer does not wish to suggest that they are incapable in this respect by any means, but it is certainly better to avoid this arrangement if possible. The gain effected is in getting water through quickly; but it is in effecting this gain that a loss may occur in the inability of the material to deal with water that passes through too rapidly. Water that is practically forced through may not only effect its passage without being operated upon, but it may also carry impurities through that are continually being collected. Further than this, there is every likelihood of the water, by its somewhat violent action, forming minute passages or channels for itself; and this is far from being desirable. This possibility is one of the best of reasons for overhauling filters of all kinds periodically, if only to disturb and rearrange the filtering medium. If water under pressure has to be dealt with, then it is very desirable to have the filter of ample size—that is, with ample area of filtering medium; or what is very usual two or more filters, i.e., a battery, is used. Another form of filter likely to suffer in the same way as those used under pressure of water is that which some makers supply for use with pumps. The filter is arranged for connection to the extreme end of the suction pipe, so that the water is filtered as it passes from its source into the pipe. The intermittent action of the pump must necessarily make the filtering process less perfect than if the water passed through the filtering media regularly and, above all, very slowly.

There are certain differences of opinion as to the efficiency of loose granular filtering material as against that which is used in the form of solid blocks. Those who wholly advocate loose material suggest that the blocks have channels and passages worn through them by the action of the water, as some parts of the block may be less dense and hard than others. On the other hand, the users of block material consider that they are able to arrest and deal with practically all the impurities on the surface of the media, and a boiling, washing, and scraping is all that

needs be done for cleansing away the foul matter. Of course, the blocks are easily removable for renewal when necessary, the same as with those filters using loose material. There is one filter made which combines the two plans, and is to be admired on this account. It is furnished with block or hard ends, and granular in the centre part, the whole being encased in metal. The water has to pass through the solid portion before having contact with the loose filling.

There was a time, and not very long ago, that all filters were denounced as delusive devices, frauds in fact; but this cannot be said now. Filtering is essentially practical at present, and a high degree of skill is being devoted to the necessary appliances. The one particular feature that cannot be too strongly impressed upon everyone having filtering works to erect or control, is the provision of ample facilities for cleaning, and the actual carrying out of the cleansing that is made provision for. As before mentioned, a time must arrive when a filter, if not cleansed, will prove a source of contamination, or, if not this, it will have become choked and unable to perform its functions.

ECONOMICAL CONSTRUCTION IN CHINA.

THE constructions we see in any country at any time are the product of three factors, the resultant of three forces, the solution of three simultaneous equations—put it how we will—and these are:—

1. The materials readily available and their relative costliness.
2. The knowledge of the principles of construction possessed by the country.
3. The degree of artistic taste attained by the country and of material comfort they have learnt to expect.

These forces are all acting in their own proper directions, in each case with varying strength, and their resultant is the design and construction of every building or other structure we see. The mental exercise of determining these factors from their product is what gives such interest in viewing notable buildings, particularly when the third factor has evidently been prominent in its influence. Then the determination is the special work of the architect, and forms one of his most engrossing studies.

Where the second factor chiefly obtains, or is palpably wanting, the student of building construction as a science finds his greatest interest, and where ingenuity has been displayed in using such materials as were available, however unconventional their use for the purpose—i.e., where No. 1 has been prominent—the pioneer of partially-settled countries may well devote himself to the study of such cheap constructions.

The first of these considerations, except in ecclesiastical or public buildings, is generally the most conspicuous, and in England we can generally get an idea of the geology of any district by observing the materials of which the bulk of the buildings are constructed. In Scotland, for instance, we find in nearly every town buildings of stone, and if we walk to the first spot near the town where the rock underlying that town can be seen, we get an immediate explanation. In East Anglia a vast majority of the churches are built of flints, and a slight knowledge as to the stones most commonly found in Norfolk and Suffolk will afford evidence enough as to the reason for this.

But the readiest material to hand does not always give a clue to the structure. Until, for instance, the arch was known as a principle of construction, bricks could not be used for bridges of any length of span, however ready to hand they may have been, and we find bridges built of timber beams in cross strain, or of those enormous blocks of stone seen in some countries spanning streams, and which must have cost more to hew and move into place than a round dozen of arched spans would have cost. This great principle of construction having, however, become the property of a country, would be adapted to use the materials readiest to hand, and so we find arched bridges of stone, brick, timber, or iron, according as each is most readily available on their sites.

As to our second consideration, then *verbum sat sapienti!* A roof, bridge, or house will not be built by rule of thumb to cost £50 when a knowledge of principles of constructive science enables us to cheapen it to £25.

The present paper deals with a remarkable instance of the adaptation of materials to construction, the constructions of the poorer class—i.e., the great bulk of the people—of a country of $1\frac{1}{2}$ million square miles, and a population of 300 millions, a people who, having—to be within safe limits—2,000 years ago advanced to or suddenly acquired a civilisation, social system, and knowledge of “arts” equal to our own of a hundred years ago, have persistently maintained every minute detail of it through time, and still struggle—perhaps rightly—to do so.

In looking at a Chinaman's house we have no difficulty in at once assigning to the influence of factor No. 1 about three parts of the resultant structure. To apportion the other part between factors 2 and 3 takes more time, and may lead, if we are so disposed, to a lifetime's study of history, language, and social custom.

The great natural material everywhere ready to hand in China is the bamboo (*Bambusa arundinacea*). This plant grows freely everywhere, and more readily than our “quick-hedge” at home, while it is infinitely more adaptable to being fashioned into structures of all kinds.

The first thing a farmer does in China is to plant round three sides at least of the site of his house and steading a bamboo fence or grove, the second to cut it gradually down, and therefrom make every conceivable thing he may want, from his house itself down to his fan, opium-pipe, and chopsticks.

The bamboo can be cut from the size of the top joint of a fishing-rod to a straight, tapering mast 4in. or 5in. in diameter and 40ft. long. It is a hollow-jointed tube, as nearly round as possible, hard, strong, very light; and lest, when used as a strut, it should give way by buckling, is braced through at intervals in the most approved manner by its joints.

In China, Nature has lent herself to the toleration of ignorance or of unprogressive knowledge, and has provided on every man's land a ready-designed compression member of the best form, and a beam of nearly the best. Beginning with the house, where the plan initially is an oblong divided into three, a reception and dining room in middle, with the Lares and Penates (actual ones of wood or bronze, representing Buddhist or Taoist deities) conspicuously placed, and two bedrooms, one on either side of the reception-room. The walls and partitions are of upright posts of the larger diameter bamboo, to which are lashed with bamboo strips smaller horizontals of bamboo. Through these are intertwined still smaller bamboos, or laths of riven bamboo plastered over with clayey mud. The door is of interlaced split bamboo, with bamboo hinges. The roof is always a purlin roof. Here comes in our “knowledge of principles” clause. The “king-post truss,” with the general principle (or principal!) of framed structures, is unknown to the Chinese, and the pieces, therefore, must all be in transverse strain. Large bamboo purlins are placed longitudinally from one partition to another; rafters of smaller bamboos are lashed to these, and still smaller are overlaid longitudinally again. On these a thatch of broad leaves is laid, and the roof—the lightest, probably, constructed anywhere—is finished. The floors are generally of earth, punned hard, sometimes overlaid with “chunam,” a kind of native concrete. This finishes a house, if not warm in winter, at least cool in summer—which latter is more important in Southern China and in a country where, in cold weather, everyone carries his own private store of burning charcoal about with him in the house. Now as to furniture. The first essentials are a bed to rest (and smoke opium) on, a table to eat off, and a few chairs. These are all made, to the last ounce or cubic eighth of an inch, of bamboo. The surface of the table is a panel of bamboo clove laths split from the stems of larger diameter, laid side by side, polished side up, and framed in between whole bamboos or one whole bamboo, bent round at each corner of the table by cutting out a V-nick nearly through, and bending the cane until the mitred edges meet. This frame and panel rests on bamboo legs, with rails of smaller diameter. The bed is a flat plane of split bamboo again interlaced, resting near its ends on trestles of the same universal material. The trestle is formed by cutting out a notch in the centre of each piece forming the A's of the trestle, of such a shape that when bent around another piece—the longitudinal of the trestle—

it just embraces it, and supports it in the angle at the top of the A. These spring beds of a patent now expired, say, 1,900 years, are by no means to be despised, and the writer has, when hard pressed for quarters, or when in advance of his rear-guard, got a good night's rest out of them with a rug or coat only between himself and the laths. Certainly, they are far in advance of the iron bedstead of “modern civilization,” which has carried away below decks and leaves holes or spikes to trap or impale the weary traveller—an institution dear to the British landlady, which some of our readers may have encountered.

The inevitable mosquito curtain is slung on four bamboos over the bed, and, proving inefficient, a bamboo fan is used to ward off these direct emissaries of the devil.

To make a fan, a piece of $\frac{3}{4}$ in. diameter bamboo, two joints in length, is taken, and cut off below the two alternate joints. The upper half is then split down as far as the joint into, say, 21 or 28 thin spikes (a multiple of 7 is usual for “good joss”). These are spread out through 180° at equal distances apart, and a piece of string threaded through keeps them in place. A piece of paper is then pasted on both sides of these, and the whole trimmed off to the desired shape, and edged with paper of another colour. The fan is then ready for use by male and female alike, chiefly the former. Umbrellas are made much in the same way of the same material, and their construction is a marvel of ingenuity and patience.

We have adopted the umbrella from the Chinese (wasn't it Jonas Hanway, the City merchant, who was so wonderfully eccentric or marvellously plucky as to introduce them?) and the time may come—as it has come for a day at a time in the City—when everyone will be allowed to cool their faces, and so sympathetically the whole surface of their bodies, by the same means, instead of cooling their interiors only by iced decoctions.

For irrigation, at which the Chinese are adepts, the bamboo is invaluable. By cutting a bamboo in halves down the middle, or by cutting a notch over each joint, and there through extracting the joint an excellent water-supply pipe is made. Water-wheels also, up to 16ft. diam., are made, with the exception of the axle, entirely of bamboo, and are of most clever construction. These are used for lifting water for the irrigation of ricefields. The buckets for lifting the water are themselves joints of bamboo of large diameter—one end closed by the joint, the other open. These, working night and day, supply large areas with water, and show the value of roping in a natural force for one's own purposes, which will work on while one is asleep.

The universal tobacco-pipe of the poorer Chinese is a bamboo root and stem, about 18in. long. The root is hollowed out for the “fill,” a hot wire being put through the joints; a bit of goosequill or jade makes a mouthpiece.

Fences, short bridges, money-boxes, walking-sticks, “swizzle” sticks, sedan chairs, torches, baskets, fishtraps, hats, brushes, measures, kites, and scores of other things are all made entirely from bamboo. Bamboo shoots are eaten as a vegetable, and “Bamboo Chow-Chow” is pigeon-English for corporal punishment.

OBITUARY.

THE death of Mr. Adam Will, builder and contractor, occurred at his residence, Easter Clepington, Dundee, on Wednesday week. Mr. Will was a native of Kinrossie, Perthshire, where he was born in 1821. In 1844 he went to Dundee, and soon after entered the service of the Police Commissioners, with whom he learned the business of causeway-laying and roadmaking. He subsequently became associated with Mr. McIntosh, his uncle, a local contractor and quarrymaster. In 1849 he began business on his own account. Soon after he obtained large orders, the paving of the jetties and boat slips for the railway company at Broughty Ferry being the most important. As the city extended, many opportunities were afforded Mr. Will to increase his business. Important contracts were placed in his hands—such, for instance, as paving and drainage works in all parts of the city, the most conspicuous being the carrying out of the drainage system from Lochee to Dundee by way of Invergowrie. Mr. Will erected calendering works in North Tay-street, and extended Caldrum Works. He was also in-

trusted with the alterations and extension on North Dudhope Works, besides having to execute similar alterations and additions to other mills and factories in all parts of the city and district. The Free Church in Albert-square was also erected by him. The most important, however, of all his undertakings is the Esplanade extension, which he did not see accomplished. Mr. Will purchased, 16 years ago, an estate situated between Inverkeithing and Queensferry in Fifeshire. Since opening this quarry he has carried out large paving contracts in Montrose, Arbroath, Forfar, Perth, Musselburgh, and other places, and also supplied contractors in Leith, Edinburgh, and notably at the Forth Bridge Works. Mr. Will was also lessee of Camperdown Quarry, Lochee.

CHIPS.

The foundation-stone of a mission and settlement in Battersea, connected with Gonville and Caius College, Cambridge, was laid last week. The building, which will occupy a site at the corner of Holman and Harroway-roads, will cost £1,850. Messrs. W. and C. A. Bassett Smith are the contractors, and Mr. Martin is the builder.

The rural sanitary authority of the South Stoneham Union having applied to the Local Government Board for sanction to borrow £12,000, for purposes of sewage disposal and surface drainage for a proposed special drainage district, to comprise the ecclesiastical district of Eastleigh in the parish of South Stoneham, Mr. Thomas Coddington, M.Inst. C.E., an inspector under the Local Government Board, held an inquiry into the subject on Tuesday week. The plans had been prepared by Mr. H. J. Weston, of Shirley, whose scheme was selected by Mr. Mansergh in a recent competition.

On Thursday, the 30th ult., Major-General Philip Carey, of the Local Government Board, held an inquiry at the town hall, Folkestone, in respect to an application by the corporation for permission to borrow £3,650 for the purpose of contributing to the widening of Radnor Park Arch. Mr. Butt, of the South Eastern Railway, explained the plans prepared in the offices of that company, which show a bridge 55ft. 6in. in span, and 24ft. in height. It will cost £5,100, contributed by the railway company, the Folkestone corporation, and Earl Radnor, and will provide a widened approach to the sea front from Cheriton and other districts north of the railway.

The Hollingworth-Magniac or Colworth collection of works of art fetched long prices in the sale-rooms on Saturday, Monday, and Tuesday—£11,072 being realised on the first day, £3,415 on the second, and £18,343 on the third. The first day's sale consisted of historical portraits painted in the 16th century, chiefly of small size, many of which were attributed to Jean and Francois Clouet. The high prices realised were the more noteworthy, as in many cases there were doubts as to the originality of the portraits. Mr. Henry Armstrong, the newly-appointed director of the National Gallery of Ireland, gave, for that institution, 305 guineas for a small portrait by Holbein of Sir Henry Wyatt, in fur-lined robe and black cap. The Limoges enamels fetched high prices.

A Government inquiry was held at Oswestry on Wednesday week by Mr. Rienzi Walton, a Local Government Board inspector, before whom evidence was taken as to the Oswestry Corporation borrowing £8,000 for the purpose of finishing the reservoir at Penegwely, six miles from Oswestry, now in course of construction. Mr. Harry Rofe, the engineer of the scheme, prepared the plans, and explained that there had been a difficulty with the contractor resulting in the termination of the contract in April last.

The fine Church of St. Mary, Shrewsbury, has just been much beautified by various alterations in the chancel. An entirely new floor has been laid with encaustic tiles and polished Anglesey marble steps. The tiling is exceedingly effective, and does much credit to Messrs. Godwin and Son, of Luggwardine Works, Withington, Hereford, who have used their well-known “Antique” encaustic tiles with great success, the whole being of a pleasing and harmonious tone. A handsome stone screen has been erected between the choir and the chancel, and wrought-iron grilles have been placed in the sanctuary arcade. The architect for the work was Mr. A. E. Lloyd Oswell, A.R.I.B.A., of Shrewsbury.

Rosebery-avenue will be formally opened tomorrow (Saturday) afternoon by the members of the Improvements Committee of the London County Council.

The soirée of the Institution of Electrical Engineers was held on Friday evening in the galleries of the Royal Institute of Painters in Water Colours, Professor Ayrton (the president) and Mrs. Ayrton receiving the company.

CONTENTS.

Desiderata in Competitions	35
The Royal Society of British Artists	35
Stability of Walls on Soils.—I.	36
Filtering Water.—II.	37
Economical Construction in China	38
Obituary	39
Our Illustrations	40
Wayside Notes	40
Competitions	41
Architectural and Archaeological Societies	40
The Building News Directory	XIII
Notes from Edinburgh	57
Building Intelligence	57
Correspondence	58
Intercommunication	58
Legal	59
Legal Intelligence	59
Water Supply and Sanitary Matters	59
Our Office Table	59
Meetings for the Ensuing Week	60
Trade News	61
Tenders	60

ILLUSTRATIONS.

THE SELECTED AND OTHER DESIGNS FOR THE NEW
MUNICIPAL BUILDINGS, OXFORD.

Our Illustrations.

OXFORD MUNICIPAL BUILDINGS.

We illustrate herewith the chosen design for these important buildings, which are forthwith to be erected in Oxford, and we give similar illustrations of the principal drawings of three of the other four designs submitted by the selected competitors in the final contest. We have already somewhat fully described the several schemes and expressed our opinion that the best design has undoubtedly been determined upon. Mr. Henry T. Hare, A.R.I.B.A., is the architect, as announced by us last week. We give his two principal plans and the perspective view. Next week we intend to follow these up with his details, so that the thought and skill of his composition may be more clearly seen. Mr. J. B. Hinkins, of Liverpool, shows a similar perspective view and two plans. Mr. Charles Bell's design figures best in his elevation, which we give with his chief plans, and the same compliment is given to Messrs. Cheston and Perkin's scheme. We shall illustrate Mr. E. Runtz's design next week, with further details from some of the others to-day given.

CHIPS.

The annual meeting of subscribers to the British School at Athens was held at 22, Albemarle-street, W., yesterday (Thursday), at 5 p.m., the Marquis of Bute occupying the chair.

The corporation of Berlin have resolved to incorporate the suburbs within a radius of about ten miles from the centre of the city. With this extension the number of the inhabitants of the German capital will considerably exceed three millions.

A new pavement is being brought out in the United States. Its foundation is steel plates laid in sand. These plates are 3ft. long by a ½ in. thick, and strong enough to stand a tensile strain of 50,000lb. to the inch. They are flanged on the sides and laid from curb to curb across the street. The flanges are pinned together, and the plates perforated for drainage.

It was reported to the City Court of Common Council on Thursday last week, that fresh plans had been prepared by Mr. Murray, the city surveyor, for the Central Criminal Court, which had satisfied the prison commissioners, and which would shortly be submitted to the court. It transpired that of the £1,200 required to meet the cost of removing Stevens's Wellington Monument from the Consistory Chapel to the centre of one of the arcades in St. Pauls, two-thirds has been subscribed.

Foundation-stones of a new Wesleyan chapel at Crossgates, Leeds, were laid on Saturday. It will replace a small structure built in 1882, and now to be used as a school. The new buildings consist of a chapel providing accommodation for 400 on the ground-floor, and 100 in an end gallery, with vestry. The buildings are being erected from the design and under the superintendence of Mr. Geo. F. Danby, architect, of Leeds. They are to be in the Decorated Gothic style, and built of pressed bricks with stone dressings. The width of the chapel will be 40ft., and the length 60ft. with open-timbered roof. The internal woodwork will be of pitch pine. Mr. Paul Rhodes (mason and bricklayer), and Mr. T. Harrod (joiner) have the work in hand. The estimated cost is £1,100.

WAYSIDE NOTES.

NOT finding a vast deal of interest in anything concerning architectural topics on my return, it seems as well to occupy space with some account of my final rambles in Scotland. I take it that Londoners have determined to think of nothing but the election until that troublesome event is over, and architects seem to be of a mind with the rest. If they will not take to architectural topics pure and simple, I will ignore them for this week.

I wrote last from Dumblane. It should have been part of my comment on old Dumblane Cathedral that people in that part do not altogether approve of the restoration. I heard that the building was preferred in its unrestored condition. A chance tourist through a town has no right to give any opinion *pro* or *con*. In such a matter, and I can only say, therefore, that the work appears to have been well done, and worthy of Dr. Rowand Anderson's reputation, he, I believe, being the architect for the restoration. It is much to be hoped that the beautiful west front will remain intact. It would be nothing if restored. At present it is in a glorious state. Mouldings have gone and are going, I admit; but it always appears to me that, whilst structurally sound, restoration of any kind, in any building, is wholly uncalled for.

On the way to Edinburgh I visited Stirling. Unfortunately the Wallace Memorial, of much fame, "is open every lawful day" only, and it being Sunday—an unlawful day—I could not climb the tower. Nevertheless, the view from the summit of the hill was open, lawful or unlawful, and is well worth the trouble of the ascent. Stirling looks very well standing out of the lowlands, and one can understand that it is considered a small Edinburgh. The general effect of the place, with its castle-crowned acropolis, much resembles that of the capital city when viewed from some little distance. Stirling has something in its general appearance that is in harmony with its name. The place looks solid and prosperous, and has an air of thoroughness. The old castle, famous in history, commands an extensive view of the valley of the Forth and the near range of hills and distant mountains. The river at this spot is quite a change from Highland torrents, such as the Leny, that rushes and tumbles along its rocky bed in the beautiful Pass of Leny, near Callander, where white foaming waters, cascades and rapids, and green wooded banks, overhung with grey cloud-topped mountains, make up so many delightful pictures. Here is a true Highland river. At Stirling we have an ever-flowing lowland stream that glides past the outskirts of the town, and is crossed by the renowned old bridge easily to be detected from its modern companions. The High-street at Stirling is very picturesque, and retains many of its old Scotch crow-stepped gables. At the top of the street is the old church, curiously divided into two, and used as two distinct buildings—the East and the West Church. The castle is, of course, very interesting architecturally, but its description would take much time and space.

Dunfermline came next on my route, and was well worth a visit. The visit, it is true, was more accidental than designed. It was my intention to get out of the train to Edinburgh at Dalmeny, and inspect the great Forth Bridge, and it happened to become necessary to change at Dunfermline, and wait there for a stopping train for an hour or so. An opportunity was therefore afforded for seeing the old abbey ruins, and the church and the tower, emblazoned on the parapets "King Robert the Bruce," and surmounting, I believe, the mortal remains of that monarch. Unfortunately, I could not get in the building, so contented myself with inspecting the ruins hard by, which betokened the once-existence of a very fine structure.

It was whilst leaning upon the wall of the elevated churchyard of Dunfermline, and gazing across the surrounding country, that I espied three curious triangular projections over a distant green field that rose clearly against the sky. Curious as was the sight, it, of course, did not take many seconds to realise that here was the object of my next sight-seeing essay, the three

triangles being the upper portions of the Forth Bridge cantilevers. "At last," thought I, "I see the Forth Bridge, whereof every man and woman tourist sings the praises." Dalmeny being on the south side of the Firth of Forth, I crossed over the bridge first of all; and after seeing this great work from afar and near, from the railway, from the roadway under the railway, and from the small granite pier that runs out into the river on the west side of the bridge, I must say that the most impressive effect is that of the great steel tubes and lattices as one passes them in the train, so long appear their spans and so lofty their height. Truly it is a grand work. Not the least impressive are the small girder bridges at the end of the cantilevers, which are at a dizzy height and supported on tapering granite piers which, if structurally sufficient, appear so slender as to ill-satisfy the demands of the eye.

It must often occur to many to ask how the bridge is going to pay for its erection. When one sees the amount of traffic sent over it, there is less difficulty in understanding the value of the accommodation it affords. The evening on which I was at Dalmeny saw train after train cross the bridge. It looks specially well whilst a train is thus crossing, the small dot of steam in the cantilevers giving a scale whereby the size of the structure may be gauged.

The new Edinburgh National Portrait Gallery is a very fine work. Its general appearance must be well known from illustrations. Dr. McGregor's church at the end of the public gardens is being rebuilt, and there is some nice stonework employed in the new building. The Caledonian Railway Company's new station progresses. When complete, it should be a very elaborate example of railway station architecture.

GOTH.

COMPETITIONS.

DOUGLAS HIGHER GRADE AND TECHNICAL SCHOOLS.—At the last meeting of the Douglas School Committee the designs of Mr. Thomas W. Cubbon, of Birkenhead, were selected in a limited competition, accommodation being provided for 300 children at a cost of about £1,000.

HOYLAKES AND WEST KIRBY LOCAL BOARD OFFICES.—On Monday evening a meeting of the General Purposes Committee was held for the purpose of receiving the assessor's report on the designs for the above, the result being that the plans of Mr. Thomas W. Cubbon, architect, of Birkenhead, received the first premium; Mr. Thomas Cook, of Liverpool, 2nd; Mr. Keefe, 3rd; and Mr. Ware, fourth premium. The cost of the new buildings will be about £3,000.

WOMBWELL.—In the Wombwell School Board competition Mr. C. J. Innocent, Sheffield, the assessor, recommended the designs submitted under the motto "Dux." The board on Monday appointed the authors—viz., Messrs. S. Butterworth and Duncan, 4, South-parade, Rochdale, architects, and instructed them to prepare working drawings.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

GLASGOW ARCHITECTURAL ASSOCIATION.—The usual monthly meeting was held in the rooms, 114, West Campbell-street, on Tuesday night, the president in the chair. A paper was read by Mr. Walter Watson on "Local Building Stones," in which he described the qualities of the more important examples in use in the West of Scotland. A short discussion followed, opened by Mr. D. McKerron. Thereafter a paper on "Cements" was read by Mr. F. V. Burke, who confined his remarks almost exclusively to Portland cement, pointing out the great variety in quality and consequent inaccuracy of tables giving the strengths, which are published, and that only by testing the actual example to be used can a satisfactory conclusion be arrived at. A lengthy discussion followed, opened by Mr. Hugh Dale.

Keighley Institute and Technical School has been fitted with a new clock by Messrs. Wm. Potts and Sons, of Guildford-street and Cookridge-street, Leeds. The clock shows the time upon four 6ft. illuminated dials, and strikes the hours and St. Mary of Cambridge chimes, upon about 3 tons of bell-metal.

NOTES FROM EDINBURGH.

THE building trades during the past half year seem by all accounts to have had a monopoly of profitable business, trade having been generally dull, with no immediate prospect of recovery. A large amount of important contract work is now, and for some time will be, carried on in the city and its precincts. Joiners and slaters have very recently secured a small rise in wages, having obtained a farthing per hour guaranteed for a year or so, instead of the half-penny they desired. Wages indeed are now very nearly what they were in 1874—masons getting 9d. and 9½d. per hour.

The prospects of completion for the University Hall are still remote. The erection of the roof has suspended all operations upon the interior, and the lantern or eye of the dome is not yet in its place. The workmen have finished laying the lead, of which there are 100 tons. The scaffolding is now removed; but the proportions of the hall can hardly be estimated with the interior open from the dome to floor of basement.

The new Caledonian railway station, also a work of magnitude, has been making steady progress with its shed, which, so far as its skeleton framework is concerned, is now completed. The roof is designed, with a series of sheds placed transversely to the line of railway, hipped and slated immediately over the massive wall, and then gabled and glazed, with continuous ventilation, gables crowning the erection. These sheds and their sustaining wall take a wide circular sweep on the south side towards the eastern extremity, in order to meet the verandah and entrance front, now brought forward to the street, and the dimensions of which are necessarily contracted in their width—to less than half that of the shed itself. The perspective of the range of gables to the south is not unpleasing to the eye; but the architectural appearance of the entrance loses much by the determination of the directors to have the entrance as it is. The architectural design of the verandah, side and front, though in all respects excellent, will appear to less advantage than if it had been 50yds. further from the street. Possibly the present arrangement may be a necessity, in view of the ultimate construction of the Prince's-street tunnel, connecting the Caledonian line with Leith.

The carriage-way division of the entrance is completed, or nearly so, but the rest must wait till the traffic can be provided for on the south side. The foundations for the boundary-wall in the line of the Lothian-road are being laid in concrete at a depth of about 20ft., and still uncompleted, and till this wall is built no further progress can be made with the entrance front. The façade of the carriage-way is being roofed with lead, and is in itself a sample of street architecture, of a piece with the best old Classical work of the New Town. The entrance front is designed in the monumental style of the triumphal arch, and the Lothian-street elevation corresponds to it with good effect. A massive entablature and corner is carried on twin pillars, with large circular-headed lights between. These windows are lofty in their proportions, and have lintels at the springing of the arch. The two mullions below are carried up above this lintel into the arch, in the form of caryatides, or with female heads affixed to volute projections for the bust. This ornamental device, whatever it may signify, has been happily selected, and the whole, so far as it has gone, is as good an example as may anywhere be seen of the capabilities of well studied proportions and simple sub-divisional details, without any of the vagaries too frequently found in many unfortunate endeavours to improve upon the regular methods of design.

The work of demolition of the old West Kirk has been going on apace, and has now left exposed the only portion to be retained—viz., the tower and spire. Most people will not fail to be struck with the very elegant proportions of this, the only piece of architecture about the church as it was. As a sample of a Classical spire, it is far before anything of Sir Christopher Wren's, numerous as are his designs. The idea of piling up one stage upon another to get the necessary altitude is not at all apparent here, and the rather squat proportions of the stages between tower and spire are just the excellence of the whole. Unfortunately, this elegance of proportion will be lost in a great degree by the juxtaposition of the new and larger edifice.

The civic authorities have in contemplation a

small improvement scheme (to cost, however, about £20,000), by which the contracted thoroughfare of Bristo-street, where it intersects the Lauriston thoroughfare, will become an open space, thus exposing to view the Students' Union building, and allowing the eastern end of the university, and especially the hall, to be seen to advantage. Ostensibly the object in view is to accommodate the heavy traffic which passes at present through a street where two carts can barely pass each other. The managers of the infirmary having resolved to carry out the more expensive plan of enlarging their accommodation—which includes the purchase of the Sick Children's Hospital—that institution is to be provided with new quarters further south. Nothing appears to have been decided as yet as to the enlargement of the County Chambers. The Town Council have embodied their suggestions in a plan—which does more justice to the elevation in George IV. bridge than the plans at first approved by the County Council,—but which retained the present character for that elevation as the back of the building.

The purification of the Water of Leith work has been much delayed by unexpected obstacles. The line of sewer is nearly completed, but in the Leith district there still remains much work to do, and the contractors have obtained an extension of time for the completion of the contract.

The exhibition of the Society of Scottish Artists has been open for some time, and may be said to have been fortunate in securing the appreciation of the public. As a whole, it forms a much more attractive exhibition than that of its elder brother or rival, the R.S. Academy. The walls are not crowded with the pictures of all and sundry, the statuary is disposed of through the rooms—and there are numerous examples of eminent artists, which, by the rules, could not be seen in the Academy Exhibition. Painting of the artistic sort is now so general as an accomplishment, that purchasers are not easily found for the multitude of pictures the creation of the professional artist's fancy and skill, and anything that promises a chance of bringing such works under notice of a purchaser is more than ever a matter of necessity. A medium for advertising, better than this auction room, is attained by this Society, which has made a good beginning.

CHIPS.

The Bishop of Lichfield laid, on Saturday afternoon, the foundation stone of a new infirmary to be erected by the Lewisham Guardians at a cost of £60,000. In the afternoon the Countess of Dartmouth laid the foundation stone of the new church of St. Swithun, Hither-green, Lewisham. This church is being built from the designs of Mr. Ernest Newton, and was illustrated by a bird's-eye perspective and plan in the BUILDING NEWS for Aug. 16, 1889.

The Bishop of London distributed, on Monday, the prizes to the students of the engineering and general literature departments of King's College.

A special meeting of the county council for Dumbartonshire was held at Dumbarton on Friday, when the sub-committee appointed on the question of enlarging the present county buildings reported that they had selected the plans of Mr. D. M'Naughton, architect, Glasgow, which show improved accommodation for all the county officials. Estimates had been obtained, and the committee recommended the acceptance of the lowest, amounting in all to £8,753 0s. 10d. The report was adopted.

Haddington Abbey, which during the past nine months has been undergoing a complete renovation, was reopened on Friday. The alterations have been carried out at a cost of over £5,000, principally raised by subscription. The architects were Messrs. Hay and Henderson, of Edinburgh. An organ is being erected at a cost of £1,000.

The latest improved ventilators of Messrs. Baird, Thompson and Co., London and Glasgow, are being adopted in connection with the improvements at the Glasgow prison.

A large clock has recently been sent out to Nagercoil by John Smith and Sons, Midland Clock Works, Derby.

The annual meeting of the Royal Archaeological Institute will be held at Cambridge from Aug. 9 to Aug. 16. Excursions will be made during the week to Bury St. Edmund's, Audley End, Saffron Walden, Lynn, Castle Rising, and the Fen churches.

Mr. T. G. Jackson, A.R.A., will lecture at Toynbee Hall on Wednesday next, July 13, at 8 p.m., on "The Architecture of the 15th Century."

Building Intelligence.

BATLEY.—The memorial-stones of the Public Baths and Technical Schools in course of erection at Batley were laid on Saturday. The site for the baths is between Cambridge-street and Wellington-street. The dimensions are to be 134ft. by 126ft. The walls externally will be of Delph stone, lined with white, brown, yellow, and black glazed bricks. The first-class swimming-bath will be 75ft. 6in. by 33ft. 6in. A second-class swimming-bath will be 85ft. by 45ft. There are to be twenty slipper-baths, which will be divided into first and second-class. Rooms are reserved for Turkish baths. The cost is estimated at £8,000. The plans have been prepared by Mr. W. Hanstock, of Batley. Messrs. T. Bradford and Co., of Manchester, and Messrs. J. Bagshaw and Co., of Batley, are the engineers. The mason's work is being done by Mr. Isaac Nelson, and the joiner's work by Mr. Henry Brooke. Mr. Joseph Hepworth is clerk of works.—The technical school was also designed by Mr. Hanstock. The site is opposite that of the baths. The building will be three stories high, and will accommodate 300 students. The design now being carried out is arranged so as to allow for the duplication of the building at some future time. The structure, exclusive of fittings, will cost about £3,500.

HAYDOCK, LANCs.—The parish church of Haydock, near St. Helen's, has been consecrated by the Bishop of Liverpool. The church was erected from plans prepared by Messrs. Douglas and Fordham, of Chester, and the total cost was about £4,300. It stands by the side of the old and inconvenient parish church which now forms an aisle. The most prominent feature of the new fabric externally being a fine central tower with an octagon spire 90ft. high. The upper part of the tower contains a belfry chamber. The building itself has an oak-timbered framework filled in with brickwork in order to guard against any future subsidence of the land through the coalmining operations in the district. The total length is about 170ft., and the width, including the old church, with which it is internally connected by an arcade, 72ft. The floor of the church is of wood, and accommodation is found for nearly 600 worshippers. The contractor was Mr. Thomas Browne, of Chester.

GOOSE GREEN, DULWICH.—The first of the public baths and washhouses for Camberwell were opened on Saturday. The baths are adjacent to the Dulwich Reform Club, and face Goose Green. The first-class bath is 120ft. long by 35ft. wide, by the usual depth, and contains 130,000 gallons of water. The second-class bath is 90ft. by 35ft. wide, and holds 100,000 gallons. There are 60 slipper baths. The architects are Messrs. Spalding and Cross, who have also in hand erection of baths for the same vestry at Camberwell Green.

On Friday night the workmen in the employ of the Southampton Corporation presented the borough surveyor, Mr. W. B. G. Bennett, with an illuminated address, on his recovery and return to duties after a severe accident, and in token of appreciation of 16 years' service.

A valuable addition to the Greek collection of antiquities at the British Museum has just been made in the form of ten Athenian vases. There are three kylixes, two certainly being by Sotades. The subjects are Polyseidos immured in the tomb of Glaucos, son of Minos, a girl plucking fruit from an apple-tree, and a man holding a club and facing a serpent. All three have for the ground a pale cream-colour, with the figures drawn in a warm bistre. There are three other kylixes with red figures, a stamnos by Smikros, a white Athenian lekythos, and two in alabaster. The vases, with two others now in the Brussels Museum, were discovered during the construction of a sewer in Athens in 1890, and were purchased for the Bloomsbury collection from Mr. A. Van Branteghem.

The Bishop of Dover visited Folkestone on the 27th June and conducted the opening service at the new church of St. Saviour. At present there are only the chancel, the first bay of the nave, organ chamber, and vestry erected. It is proposed to add a tower and spire and a southern transept. The entire work will cost £10,000, and that of the present section of the building was £3,000. The style of the church is Early Gothic, the material is Kentish rag laid in courses, and the plans were designed by Messrs. Somers Clarke and Micklethwaite, of London. The builder is Mr. William Dunk, of Folkestone.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 832, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL, XLII, XLVI, XLIX., L., LI., LIII., LIV., LVIII., LIX., and LX. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—W. R. M. and Co.—S. G. T.—Romano.—J. R. Wilcox.—B. R. G. (Sunderland).—Scotia.—C. M.

Correspondence.

COMPETITIONS.

To the Editor of the BUILDING NEWS.

SIR,—I have been waiting to see if your leader of the 24th ult. would draw out any remarks from older competitors than myself, upon the conduct of competitions—more especially with regard to the fulfilment of the duties of assessor.

I rather wonder that all we have lately had the opportunity of reading upon this "main difficulty" has not suggested a practice followed by one or two professions. Why not make it more common to appoint two or more assessors known as being specially qualified for the particular class of work for adjudication? It need not be at greater extra cost than in the other professions. I am supposing cases of large and important works, as may lately be instanced, which—though, I fear, disregarded by the majority of the public—ought not to be considered of less importance than a "special case" in medicine or law, when often more than one of the best and most skilled authorities are sought and obtained.—I am, &c., M. R. ELLERTON.

A Wesleyan chapel in Gravel-lane, Salford, was opened last week. It is seated for 1,100 persons, and adjoining are two vestries, a lecture-hall, coffee-bar, and library. Mr. Walter Sharp, of Manchester, was the architect.

At the local board offices, Colwyn Bay, on Friday, Colonel W. M. Ducat, R.E., Local Government Board inspector, held an inquiry into an application by the local board for sanction to borrow £5,853 for the construction of the subway, the widening of Eirias Bridge, the construction of a footpath to Old Colwyn works of water supply, street improvement, and the purchase of a fire-engine.

Intercommunication.

QUESTIONS.

[10800].—Blackboard.—Will any of your readers kindly tell me how to make a blackboard, such as they use at schools for explaining arithmetic, &c., on? The one I have made retains the chalk marks, which will not wash out, but leave the board scratched.—BELGIQUE. [1]

[10811].—Wet in Coach-House.—Lean-to roof of coach-house, rise 4ft. on 18ft., covered with slate, no ceiling. No window or ventilation. Wet comes through after frost. Will someone suggest remedy?—G.

[10802].—Cracking of Boiler Masonry.—We have been very much inconvenienced by the cracking of masonry (brickwork) in which several boilers are set here for the cooking of pig's food, &c. Can you suggest a means whereby this may be avoided?—JOHN A. WALLIS, M.D., County Asylum, Whittingham, Preston.

[10803].—Planning a Roof.—Information is desired how to find and draw correctly on plan the position of hip and valley rafters for a roof. Must they always be at angles of 45° degrees on plan with the ridge; or can they be at any angle? Imagine a building having eight gables of different heights, and the eaves at different heights, and six hipped dormers half-way up the roof; the pitch of the main roof being much steeper than the gable roofs, and the dormers being the same pitch as the gables. How to plan hips and valleys?—CARPENTER.

[10804].—Heraldry.—Will any of my fellow-readers who may be familiar with the neighbourhood around Maidstone kindly give me a list of places where I may find heraldic subjects of a good class, as mediæval tombs, brasses, painted glass, and such-like? I want to make Maidstone the base of operations, an elderly relative staying there, while I take daily excursions, distances within a moderate bicycle run on an average; time available ten days or a fortnight.—BEND ON.

[10805].—Arch.—To arch with bricks a passage-way 24ft. by 12ft., strong enough to carry heavy casting and ballast. I wish to know the best pitch and form of arch, the size of bricks and how laid, and treatment of the side walls under ground to the abutments?—A READER.

[10806].—Cleansing Brick Interior of Church.—I have the interior to cleanse, repaint, and varnish, &c. The brickwork is very dingy, and in parts smoked by the gas. What is best to do with it? It is of picked stock bricks of the London district, with struck and cut joint, rather rough; but the joints are too sound to warrant raking out and restopping with joints of same class, as at present, and I do not like the other alternative of raking out and tuck pointing, which offers a sham joint, out of place in a church. The arches are gauged work of red and black bricks. The joints of the stock brickwork are rather ragged at the edges, so that they cannot well be lined out with any colour. What is usually done with brick interiors? They appear to me to be rather difficult to deal with, and yet they occur so frequently that the difficulty must have often been considered.—R. Y.

REPLIES.

[10791].—Inaccessible Distance.—

NMP, NOM, and POM being all right angles.

$$MP^2 + MN^2 = NP^2, MN^2 = MO^2 + NO^2, \text{ and } MP^2 = MO^2 + OP^2.$$

$$\text{Then—} NP^2 = (MO^2 + OP^2) + (MO^2 + NO^2).$$

$$\text{But—} NP^2 \text{ is the same as } (NO + OP)^2.$$

$$\therefore (NO + OP)^2 = 2MO^2 + OP^2 + NO^2,$$

i.e.,—

$$NO^2 + 2(NO \times OP) + OP^2 = 2MO^2 + OP^2 + NO^2.$$

$$\text{Take away—} NO^2 + OP^2 \text{ from each side,}$$

$$\text{and } 2(NO \times OP) = 2MO^2$$

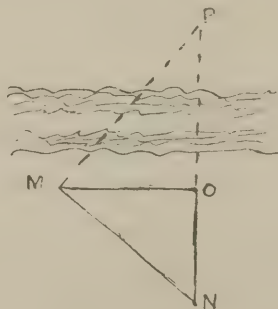
$$\therefore NO \times OP = MO^2$$

Divide each side by NO,

$$\text{and } OP = \frac{MO^2}{NO}$$

—NORTHMAN.

[10791].—Inaccessible Distance.—By construction PMN, MON, and MOP are right-angles; $\therefore PMN = PMO + OMN$, take away the common



angle OMN leaves PMO = MNO, and angle MPO = OMN. The angle MOP is equal to MON. \therefore the triangles MOP and MON are similar and their sides

$$\text{proportional, i.e., } ON : OM :: OM : OP. \therefore \frac{OM \times OM}{ON} = OP = \frac{OM^2}{ON} \text{—J. Y.}$$

[“J. W. G.” Thomas Winn, jun., and “T. C.” have also replied similarly.]

[10795].—Warmington Church, Northants.—In “The Churches of the Nene Valley,” by the late Mr. Edmund Sharpe and Messrs. J. Johnson and A. H. Kersey (published by Batsford, 1880), there are two large sheets (11in. by 14in.) of details of this church. These embrace (plate 8) an elevation of an arcade of six bays, and details of same, all drawn to scale; and (plate 71) the south porch doorway, with details. The mouldings being given a quarter full size. All the work is very beautiful and refined. “The Churches of the Nene Valley” is a book no one should be without.—HARRY HEMS, Exeter.

[10797].—Warming Entrance Hall.—In reply to “Holdfast,” it is quite possible to heat the hall from kitchen boiler, provided he can obtain a continuous rising flow, the coil in hall being at least 2ft. above the boiler, otherwise it will not work properly.—J. G. GREY.

[10799].—Size of Sewers.—Like “Invert,” I have never met with any formula for direct finding of the size of a sewer when the length, inclination, and discharge are given, and therefore venture to submit the following, which I have deduced from the formula—

$$V = 59 \sqrt[3]{H \cdot R}$$

where V = velocity in feet per minute,
H = fall in feet per mile,
R = mean radius.

This I have used in place of the more cumbersome one by Weisbach, and will be found to give practically the same results for velocities between 2ft. and 6ft. per second, and is rather more accurate than that of Eytelwein. (1) For egg-shaped sewers, in which the transverse diameter = $\frac{2}{3}$ vertical, and invert radius = $\frac{1}{3}$ transverse diameter. Take Q = discharge in cubic feet per minute, or area \times velocity; R = radius of upper portion of sewer in feet; a, a constant = 4.5941825 for sewer flowing full, 3.0433325 if $\frac{2}{3}$ of depth full and 1.136 if $\frac{1}{3}$ depth full; b, a constant = 0.579344 full, 0.6314 $\frac{2}{3}$ full, and 0.4132 $\frac{1}{3}$ full; H as before. Then—

$$Q = A R^2 59 \sqrt[3]{\frac{2 H}{b R}} \text{ and } R = \sqrt[3]{\frac{Q^2}{6728 a^2 b H}}$$

The formula referred to. As an example of its application, assume it be required to find the size of an egg-shaped sewer of the proportions stated to discharge 1,350cft. per min. with a fall of 8ft. per mile when flowing $\frac{2}{3}$ (of depth) full. Applying these data we have—

$$R = \sqrt[3]{\frac{1350^2}{3889755 \times 8}}$$

$$R = 1.4245ft., (= \text{about } 1' 5")$$

That is to say, the sewer would require to be 2' 10" \times 4' 3". (2) For circular sewer: The constant a for this would be, if running full, 3.14159; $\frac{2}{3}$ (depth) full, 2.225; $\frac{1}{3}$ (depth) full, 0.916; and the constant b 0.5 if full; 0.58227, $\frac{2}{3}$ full; and 0.372, $\frac{1}{3}$ full. Taking the data and conditions as before, required size of circular sewer to do the work—

$$R = \sqrt[3]{\frac{1350^2}{19394 \times 8}}$$

$$R = 1.63675$$

\therefore sewer would require to be 39in. diameter. The constants a and b are the areas and H M.D. respectively of a sewer under various conditions of flow, whose radius equals unity.—F. E. GAY, Bath.

CHIPS.

On Wednesday week the funeral of Mrs. Caroline Cooper, of Hanningfield House, Lausanne-road, Nunhead, relict of the late Mr. John Cooper, for many years in a large way of business as a builder at Charing Cross, took place at Nunhead Cemetery, in the family grave. The deceased was in her 78th year.

A statue of Joan of Arc was unveiled at Rouen on Thursday, the 30th ult. The Maid of Orleans is standing bareheaded, her hands bound, and her hair cut short, as she must have been when led to the stake. The statue is placed on the hill of Bon-Secours.

At Bexhill-on-Sea on the 30th ult., the restored belfry, new bells and rood screen at St. Peter's Church were dedicated. The works have been carried out from the designs of Mr. Thomas Parratt, of Shepherd's Bush, W., and the screen has been executed by Messrs. Harry Hems and Sons, of Exeter.

At a vestry meeting held at Gravesend on the 30th ult., plans by Mr. Smith of that town were adopted for the restoration of St. George's Church, Gravesend, at an estimated cost of £1,000.

Drapers' premises at Chelmsford have just been extended by the absorption of a bank, the front of which has been rebuilt, and the interior remodelled. Mr. F. E. L. Harris was the architect, and Messrs. Moss and Co. were the builders.

The group of six portrait heads of men and women by Hogarth, which Sir F. Burton purchased at the Wedderburn sale the other day, has been hung in Room XVII. of the National Gallery, and numbered 1371. It is called “Hogarth's Servants,” and seems to be the picture which was No. 80 at the British Institution in 1817. It has not been exhibited since 1817, nor engraved.

The additions to the Warwick county lunatic asylum are nearing completion, and are being warmed and ventilated by means of Shorland's patent Manchester stoves and patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

Legal.

HOUSE AGENTS' COMMISSION.

DISPUTES are constantly occurring as to what introductions will entitle a house agent to claim his commission upon the sale of a house. In several cases it has been held that if an agent is employed to let or sell, and he introduces a tenant who afterwards becomes the purchaser of the house in question, he can legally recover commission upon the sale. But then there must be a clear engagement on the part of the owner with the agent to sell as well as to let, and certainly the sale to the tenant must take place within a reasonable time after the letting. These points were again raised in the recent case of "*Gillow v. Lord Aberdare*" (*Times*, July 2), which is also interesting in so far as the custom in this regard was considered by the Court. The plaintiffs' case was that they had been employed to sell as well as to let a house for the defendant at Queen's Gate, and that they obtained him a tenant who afterwards became a purchaser, and they now claimed payment of £225 as commission upon the sale, less the sum of £63 received by them upon the letting, and for which they wished to give credit to the defendant. The evidence that the plaintiffs were employed to sell as well as to let came to very little in the opinion of Mr. Justice Hawkins, who held that there was no contract of this kind to go to the jury, while the learned judge also decided that the plaintiffs could only get their commission on the letting, which had been paid, especially as there was nothing in the tenancy agreement about any option to purchase, thus showing that a sale was not at that time in the minds of the parties.

The real contest in the case was, however, upon the question whether or not such a custom existed in regard to house agents and their commission. It was objected that this could not be gone into, as it had not been raised in the pleadings; whereupon leave to amend was applied for by the plaintiffs, and, as a fact, some evidence was heard. Two firms of estate and house agents swore to a general custom that if an agent is employed to let or sell a house, and he lets it to a tenant who afterwards buys, he is entitled to a commission on the sale. But one witness laid it down that this depends on the agent being clearly instructed to let or sell; and he admitted that the custom would not apply if employed to let only; nor would it come in if the agent had been paid his commission on the letting. The other witness appeared to think it affected letting a furnished house only, and did not depend upon an employment to let or sell. The Judge decided against amending to bring in such evidence as this, and he also protested against the conclusion that because an owner replies to a circular sent him by a house-agent asking the price, the agent is thereby employed to sell as well as to let, and so can claim commission. As far as this case goes, the alleged custom has not yet been established; though there may probably be an appeal.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

BOS.—PARTY WALL.—AGREEMENT.—If, as you say, the adjoining owner agreed to pay you half the cost of the party-wall you built when he came to use it for his own house, you can now sue him for the money in the County Court, as he has refused payment.

ARCHITECT.—CONTRACT.—ERROR.—The difference in value of the work actually done and that agreed for should be deducted from the balance owing. The architect could only be made liable on the ground of negligence, if the facts supported such a contention. If the employer only pays for the work that was done, there would not seem to be any further damage that he could recover.

The premises until recently used as the post office, Chertsey-road, Woking, are to be converted into a political club, from plans selected in competition, by Mr. Clamp, architect, of that town.

The corner-stone of a new church was laid last week at Cudworth. The church, which is to accommodate 250 worshippers, is to be in the Early Decorated style, from designs by Messrs. Smith and Brodric, of Goole and Hull, and is being built at Upper Cudworth. The contract has been let for £2,340 to Messrs. Benj. Graham and Sons, Huddersfield.

LEGAL INTELLIGENCE.

HEAVY ARCHITECTS' FAILURE ON TEESIDE.—Mr. Christopher Moses, architect and surveyor, North Ormesby, Middlesbrough, was examined in the Stockton Bankruptcy Court on Wednesday week, and said his net liabilities were £19,801 4s. 1d., and he only estimated his assets at £3 2s. 7d. He retired from his profession 17 years ago, and was worth £17,000. He built a considerable portion of South Bank, and for some time saved £3,000 a year apart from his living expenses, but he had lost all his money and had been rendered insolvent to the amount stated on account of speculations in various companies which had not proved successful, and calls in connection with which had been made upon him. Amongst the companies were the Deckham Hall Land Company, the Cumberland Road Metal Company, and the Commandale Brick Company. The examination was adjourned.

HULL CORPORATION V. TURNER AND OTHERS.—Court of Appeal, June 30 and July 1, before Lord Esher, Lord Justice Bowen, and Lord Justice A. L. Smith.—This action was brought by the corporation of Hull against the contractors for the main sewers of the town and their sureties for damages caused by the contractors' bad and, as alleged, fraudulent execution of the works. The jury had in effect found that the contractors had been fraudulent (and as against them there was judgment), but that the corporation engineer was in fault in not duly inspecting the work before certifying for it, and, as the sureties were innocent, the question then arose whether or not the sureties were exonerated. It appeared that in June, 1888, the contract was made between the corporation and the contractors. The works were completed on April 18, 1889, and the borough engineer duly gave his certificate of completion, more than six months before Feb. 7, 1890, when he gave his final certificate, and the amount of the contract, £6,600, was paid. After this, however, the corporation appointed a committee of inquiry, who were satisfied that the work had been "scamped," and it came out that the inspection of the works had been left by the engineer to the clerk of the works, from whose oral statements the engineer had given his certificates, and that the clerk of the works had been deceived. The brickwork was, it appeared, shamefully done, and it was found necessary to do much of the work over again. The corporation then brought the present action against the contractors and their sureties, £7,000 damages being claimed. At the trial before Mr. Justice Grantham evidence was given of all this, and the learned Judge gave judgment against the contractors, the amount to be determined by a referee, and declined to stay execution. As to the sureties, he reserved the question of liability upon these findings of the jury. Upon further consideration, however, the learned Judge gave judgment against the sureties, who appealed. Mr. Channell, Q.C., on behalf of the sureties, contended that as they were innocent, and even the engineer was not a party to the fraud, they were entitled to set up the certificate of final completion. Mr. Forbes, Q.C., and Mr. E. T. Atkinson, Q.C., on behalf of the corporation, contended that they were entitled to judgment against the sureties, as the effect of the fraud was not to exonerate the sureties. Their lordships gave judgment on Friday, when they unanimously dismissed the appeal.

A SWINDLER OF TIMEKEEPERS.—Henry Humphrey, aged 43, of no occupation, was convicted at the Central Criminal Court on Friday, of conspiring with a man named Wilson to defraud Arthur Ward of the sum of £30, and also of obtaining large sums of money from others. For some considerable time past prisoner had been engaged, in conjunction with a man named Wilson, who has absconded, in a systematic course of swindling young men by obtaining from them sums of money, ranging from £30 upwards, as security on the pretence of procuring them situations as timekeepers, at wages of 35s. per week. No work was done, and, consequently, no wages were forthcoming. When arrested Humphrey was superintending some building works at Putney. Mr. Commissioner Kerr sentenced him to twelve months' hard labour.

WATER SUPPLY AND SANITARY MATTERS.

SALFORD.—The committee of the Salford corporation having charge of the sewage works at Mode Wheel have decided to throw the works open for public inspection on Monday and Tuesday next, the 11th and 12th inst. Several systems of purification are being experimentally tried, and information may be gained which may possibly be of value to local authorities interested in the sewage question.

It has been decided, in view of the general election, to postpone the joint annual meeting of the Gloucestershire and Wiltshire Archaeological Societies at Cirencester from Tuesday, Wednesday, and Thursday in next week to August 23rd–25th.

Our Office Table.

THE week's elections have been disastrous to those architects who were seeking Parliamentary honours. Major Isaacs has lost his seat for Walworth, and all the other architects have failed in their attacks—Mr. H. H. Bridgman at Taunton, Mr. Chatfield Clarke at Grantham, Mr. Banister Fletcher at Christchurch, and Mr. Arthur W. Soames at Ipswich. Mr. John Aird, the contractor, easily retained his position at North Paddington; but Mr. J. T. Firbank was unsuccessful in Haggerston. Many who do not sympathise with his political views will regret that Dr. B. W. Richardson was defeated at Walton, Liverpool.

AN ingenious and novel way of advertising on the part of architects seems to have met with an untimely end at Boston, U.S.A., where, it seems, the subject has caused a regular tempest in a teapot. Messrs. McKim, Mead, and White are the architects of a new public library, and the trustees instructed their architects to arrange a series of tablets along the façade of the building, with names of distinguished authors, musicians, and artists inscribed thereon. The authorities gave their architects the choice of about six hundred names to select from and arrange in such a manner as might impart interest and the most artistic effect. The choice resulted in the facetious advertisement which gave so much offence. It began: "Moses, Cicero, Kalidasa, Isocrates, Milton," giving the initials of the leading partner, "McKim." This acrostic jumble naturally enough upset the Boston people, and so did the continuation, which ran: "Wren, Herrick, Irving, Titian, Erasmus," and furnished the name of "White." How Mr. Mead's name was contrived we are not told; but the trustees had the advertisement removed, and are making their own selection. All is peace now in that city.

MR. VEREKER, the British Consul at Cherbourg, whose interest in road-making is well known, and is often revealed in his reports, refers in his last report to the extraordinary growth in the trade in macadamised stone between that port and this country. This export, which in 1890 increased tenfold over 1889, has trebled from 1890 to 1891 (when it amounted to nearly 30,000 tons), and, still in its infancy, is capable of almost unlimited expansion. Much, however, remains to be done to give it legitimate impulse; it is imperative that a tramway be established from the quarries in the Montagne du Roule to the shipping quays, thus avoiding the expense and delays of cartage from the quarries; that cranes be erected on the quays so as to insure rapid shipments; and that more powerful and effective machinery be erected at the quarries. Towards these necessary improvements something has to be done. A concession has been granted to a French company to lay a tramway along the Rue du Val de Saïre, from the point where it meets the road from the quarries and round the quays; the lessees of the quarries have agreed to construct a tramway from the quarries to meet that to the quays, and it is hoped that during the present year the work will be completed, and thus considerably promote the exportation of macadamised stone.

THE *Scientific American* gives the following recipes for wood. For yellow, paint the wood with a hot concentrated solution of picric acid, dry, and polish. Care must be exercised in the use of this stain, as the picric acid is poisonous. For grey, apply a solution of one part silver nitrate in fifty parts of distilled water, then coat with a solution of ferric acetate until the proper shade is obtained. This preparation must not be allowed to touch the hands. To stain wood a rich purple, boil 1oz. of madder and ½oz. of fustic in two gallons of water, and when boiling brush over the wood until stained, then with a weak solution of nitric acid, and finish with the following:—Put 9oz. of dragon's blood and 2oz. of soda, both well bruised, into six pints of spirit of wine. Let the mixture stand in a warm place, shake frequently. In using it lay on with a soft brush, repeating the coats until a proper colour is gained. Polish with linseed oil or finish with varnish.

AN Algerian Pompeii has been revealed by recent excavations among the ruins of the Arab city of Timgad, in the province of Constantine, a

town built in the first century of the Christian era, and devastated by the Moors and by earthquakes in the sixth century. Like Pompeii, Timgad has preserved the pavement of its streets, with ruts made by the chariot wheels, a forum with a number of statues, a basilica, a tribunal of commerce, several temples and public halls, a theatre with seats for the spectators, galleries, and entrance places for the public and the actors, fountains, baths, and a covered market with granite tables still in their places. To the south-west of the town, upon a hill, rises a temple of colossal dimensions, surrounded by spacious porticoes. This building, dedicated to Jupiter, is now being excavated, and the friezes, balustrades, and heads of the columns are already clear of earth, while the fragments of a colossal statue have also been brought to light. A broad paved road still traverses the city from east to west, with several triumphal arches spanning it, one of which, built by Trajan, and with three gateways through it, is still intact. There is also in Timgad the Byzantine citadel, constructed in haste by the troops of Solomon, the successor of Belisarius in Africa, out of the debris of the southern part of the city, several Christian basilicas, and other buildings which are to be excavated.

MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—St. Paul's Ecclesiological Society. Day visit to Canterbury. Train from Victoria. 10 a.m.

MONDAY.—Royal Institute of British Architects. Business meeting. 8 p.m.

WEDNESDAY.—Toynbee Hall. "The Architecture of the 15th Century," by T. G. Jackson, A.R.A. 8 p.m.

Trade News.

WAGES MOVEMENTS.

BIRMINGHAM.—The demand of the builders' labourers for an increase in their wages, simultaneously with that conceded to the bricklayers, was followed, as threatened on Thursday in last week, by a general strike, which, however, soon ended, as it was agreed to resume work on Wednesday, pending arbitration by Mr. Colmore, the stipendiary magistrate, who also acted in the same capacity in settling the bricklayers' dispute.

BRISTOL.—On Saturday afternoon representatives of the masters and bricklayers met at the Guildhall with the hope of settling the difference which has caused the present strike; but the men declined arbitration and adhered to their terms—namely, 4d. per hour increase, which was conceded before the strike, and one hour for dinner during the winter months instead of half an hour. As neither party would give way, the master builders decided no longer to acknowledge the rules agreed upon and signed more than two years ago between the Master Bricklayers' Association and the operative bricklayers. The rules as they stand at present, with the exception of 4d. per hour advance in wages, still hold good with the masons, plasterers, and labourers. The masters have since decided to give the 4d. advance as from Friday last, July 1st, instead of August, as awarded by the arbitrator.

COLCHESTER.—The strike in the building trade, which seemed to have been settled a month ago, but was reopened, is not yet ended. The men asked for 1d. rise in two instalments, and a new code of working rules; the employers absolutely refuse to entertain the proposal of an advance, but offer to arrange a new code.

SHEFFIELD.—The dispute in the building trade in Sheffield is at an end, and the masons affected resumed work on Saturday. The difficulty was brought about by the masons asking the employers to sign a code of rules. On meeting with a refusal to do this they struck work. The Master Builders' Association offered to refer the matter to arbitration, but the men absolutely declined to entertain the proposal. The masters have now acceded to their demand, and accepted the new rules.

Alterations have been made to the Royal Naval Club, Portsmouth, embracing the ventilation, which is now carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air, and fresh air admitted by their improved air inlets.

Mr. J. T. Beckham, of Low Ousegate, York, has just completed three figures carved in oak for the roof loft of Holy Trinity Church, Bury, Lancashire. The figures illustrated are the Crucifixion. The Crucified will form the central figure, whilst the Blessed Virgin and St. John are to be placed at either side.

CHIPS.

Plans for a new export dock to be constructed at Barry, prepared by Mr. J. Wolfe Barry, M.Inst.C.E., have been adopted by the Barry Dock Co.

Some sixty employes of Mr. F. Britton, builder, Highbury, journeyed by brakes last Saturday to St. Alban's, the occasion being the celebration of their fourth annual beasfeast. A good repast had been prepared by the proprietor of the "North-Western," which was followed by various toasts and speech-making in honour of the firm and the worthy employer who, as usual, was unanimously elected to the chair. The remaining portion of the day was pleasantly spent by cricket and a run round the historic abbey near by.

The foundation stone of a new Wesleyan chapel was laid on Wednesday week in the village of Dishforth, near Ripon. The building has been designed by Mr. Thomas Stokes, of Thirsk, architect. It will be Gothic in style, built of brick, with stone dressings. The interior woodwork is to be of pitch-pine, with seats for 120 persons. There is also to be a commodious schoolroom. The total cost will be about £550. The contractor for masonry, brickwork, and plastering is Mr. William Jackson, of Thirsk.

Holloway's Ointment.—Go where you may, in every country persons will be found who have a ready word of praise for this Ointment. For chaps, chafes, scalds, bruises, and sprains, it is an invaluable remedy; for bad legs, bad breasts, and piles, it may be confidently relied upon for effecting a sound and permanent cure.

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TENDERS.

* * Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

BATTERSEA, S.W.—For drainage works at Winstanley-road school, for the London School Board:—

Charteris, D.	£516	0	0
Lathey Bros.	348	0	0
Hammond, W.	332	0	0
Holloway Bros., Battersea	329	0	0

* Accepted.

ACKWORTH.—For enlarging rectory house, Ackworth. Mr. Wm. Watson, Wakefield, architect:—

Excavating, brick and stone:—			
Elvey, E. A.	£453	0	0
Slating:—			
Ryeroft, C. F.	£44	0	0
Plastering:—			
Driver, G.	£39	12	0
Carpenter and joiner:—			
Ibbotson, N.	£129	19	3
Plumbing, glazing, &c.:—			
Atkinson, S.	£120	0	0
Painting:—			
Turner, C., and Sons	£10	5	0

BIRMINGHAM.—For the erection of a villa residence in Moor Green-lane, Moseley, for Mr. J. L. Tustin. Mr. T. W. F. Newton, 121, Colmore-row, Birmingham, architect and surveyor:—

Parker	£2,145	0	0
Huins and Son	1,850	0	0
Rowbotham	1,793	0	0
Davis (accepted)	1,770	0	0
Hughes	1,718	0	0
Johnson (withdrawn)	1,690	0	0

BIRMINGHAM.—For the erection of "Pines," a summer cottage, for Mr. T. W. F. Newton, 121, Colmore-row, Birmingham, architect and surveyor:—

Huins (accepted)	£650	0	0
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(This was only for shell, and did not include any fittings.)

BIRMINGHAM.—For the re-erection and enlargement of a farmhouse at Bangley, in Staffordshire, for Mr. A. B. Foster, Canwell Hall, Tamworth. Mr. T. W. F. Newton, 121, Colmore-row, Birmingham, architect:—

Surman, S., and Son	£1,937	0	0
Jones and Lloyd	1,797	0	0
Clarson and Son	1,793	0	0
Johnson	1,595	0	0
Trentham (accepted)	1,580	0	0

BIRMINGHAM.—For the erection of one villa residence in Clifton-road, Sutton Coldfield, for Miss Shaw. Mr. T. W. F. Newton, 121, Colmore-row, Birmingham, architect:—

Jones and Lloyd	£493	0	0
Merton and Hughes	437	0	0
Trentham	412	0	0
Johnson	395	0	0
Simons (accepted)	285	0	0

BIRMINGHAM.—For the erection of a country house at Barnt Green, near Bromsgrove, for Mr. F. Taylor. Mr. T. W. F. Newton, 121, Colmore-row, Birmingham, architect:—

Moffatt	£1,983	0	0
Tilt and Weaver	1,930	0	0
Brazier	1,770	0	0
Huins and Son	1,730	0	0
Gowing and Ingram	1,689	0	0
Marshall	1,687	0	0
Surman and Son	1,633	0	0
Hughes, M.	1,621	0	0
Webb, J.	1,597	0	0
Jones and Mason (accepted)	1,595	0	0
Read and Son (withdrawn)	1,484	0	0

Architect's price, £1,550.

BLACKPOOL.—For the terracotta work required in the erection and completion of the Blackpool Tower Buildings. Messrs. Maxwell and Tuke, 29, Princess-street, Manchester, architects:—

The Ruabon Brick and Terracotta Co., Limited	£1,572	5	4
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BRIGHTON.—For alterations to premises in Brixton-road and Tunstall-road, for Messrs. Peter and Evans. Mr. G. Warren Cooper, F.S.I., M.S.A., Bedford-row, architect:—

Saunders, E. J.	£1,050	0	0
Triggs, E. (accepted)	900	0	0

BURY.—For the erection and completion of the new Royal Hotel, Bury. Messrs. Maxwell and Tuke, 29, Princess-street, Manchester, architects:—

Newhouse and Wrigley, Bury (accepted)	£3,385	0	0
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DUDLEY.—For the erection of a dwelling-house, Castle View, Dudley, for Mr. E. Dunn. Messrs. John G. Wright and Son, 28, Wolverhampton-street, Dudley, architects:—

Webb and Round	£290	0	0
Colcott	273	0	0
Love and Flint (accepted)	267	10	0

All of Dudley.

DUMFRIES.—For the enlargement of the County Buildings for the County Council. Mr. D. McNaughton, Glasgow, architect:—

Accepted tenders (lowest offers in every case):—

Mason work:—			
M'Cullum, J. B., Glasgow	£3,500	0	0
Joiner work:—			
Dougall and Gibson, Dumfries	1,973	5	4
Plumber work:—			
Colville, A., Dumfries	£392	14	6
Slater work:—			
Thom, A. M., Dumfries	£109	11	1
Plaster work:—			
Mackenzie, D. and J., Glasgow	£477	9	11
Total, £8,763 9s. 10d.			

EAST HAM.—For erection of shops at Plashet-road.

Mr. F. A. Ashton, architect:—			
Cocks, J. and H.	£2,600	0	0
Shurmer, W.	2,439	0	0
Hearle and Farrow	2,465	0	0
Watson, W.	2,276	0	0
Voller, F.	1,895	0	0

ERITH.—For a new flour-mill at Erith, for Mr. S. Cannon. Mr. W. Egerton, architect and surveyor.

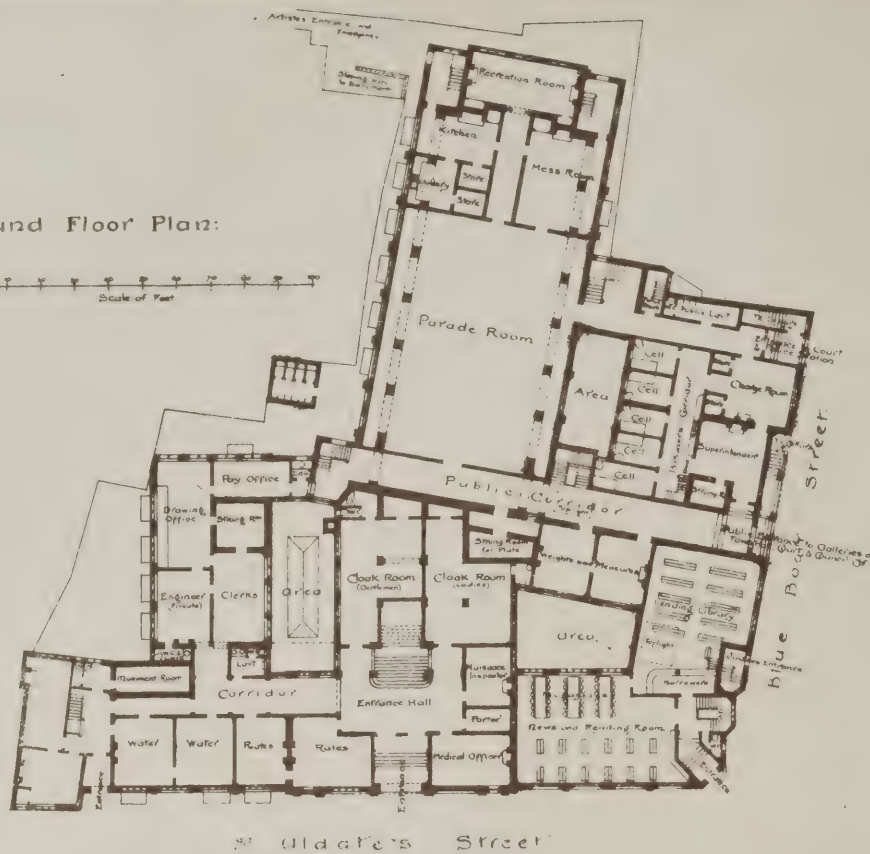
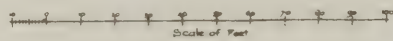
Quantities by the architect:—			
Butler, R. and J., Bexley Heath	£5,258	0	0
Miles, G., Erith	4,950	0	0
Parsons, E., and Co., Wandsworth	4,877	0	0
Boyes, T., London	4,543	0	0
Jerrard, S. J., Lewisham	4,408	0	0
Wallis, G. E., and Son, Maidstone	4,435	0	0
Kirk and Randall, Woolwich	4,242	0	0

* Accepted.

Municipal

SELECTED DESIGN

Ground Floor Plan:



Buildings Oxford.

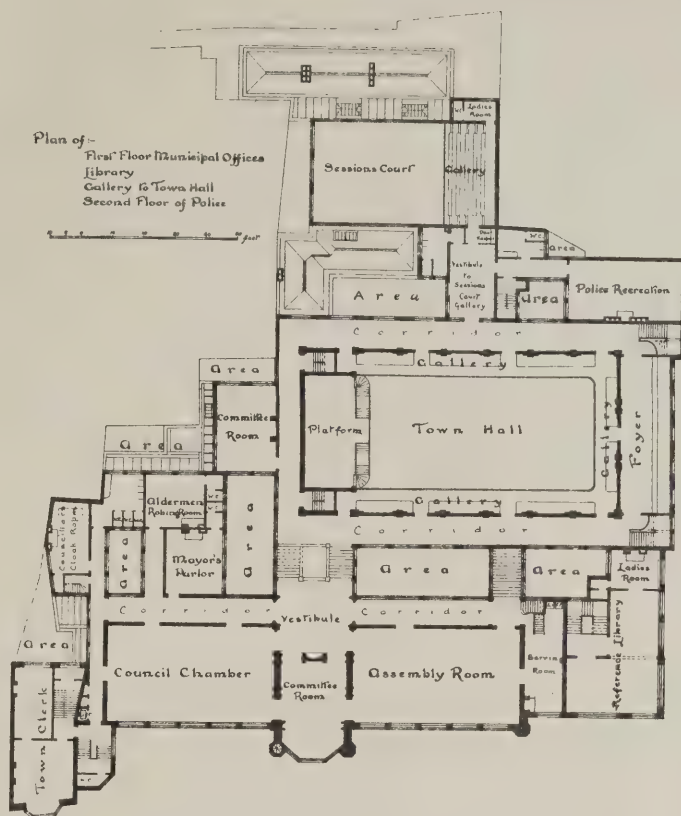
H.T. HARE, A.R.I.B.A. ARCHITECT

First Floor Plan.



Buildings ford.

IN & CHESTON, ARCHITECTS



Municipal Buildings
Oxford

Scale 1" = 40'



ST. ALDATES STREET

Ground Floor Plan

Municipal
O.

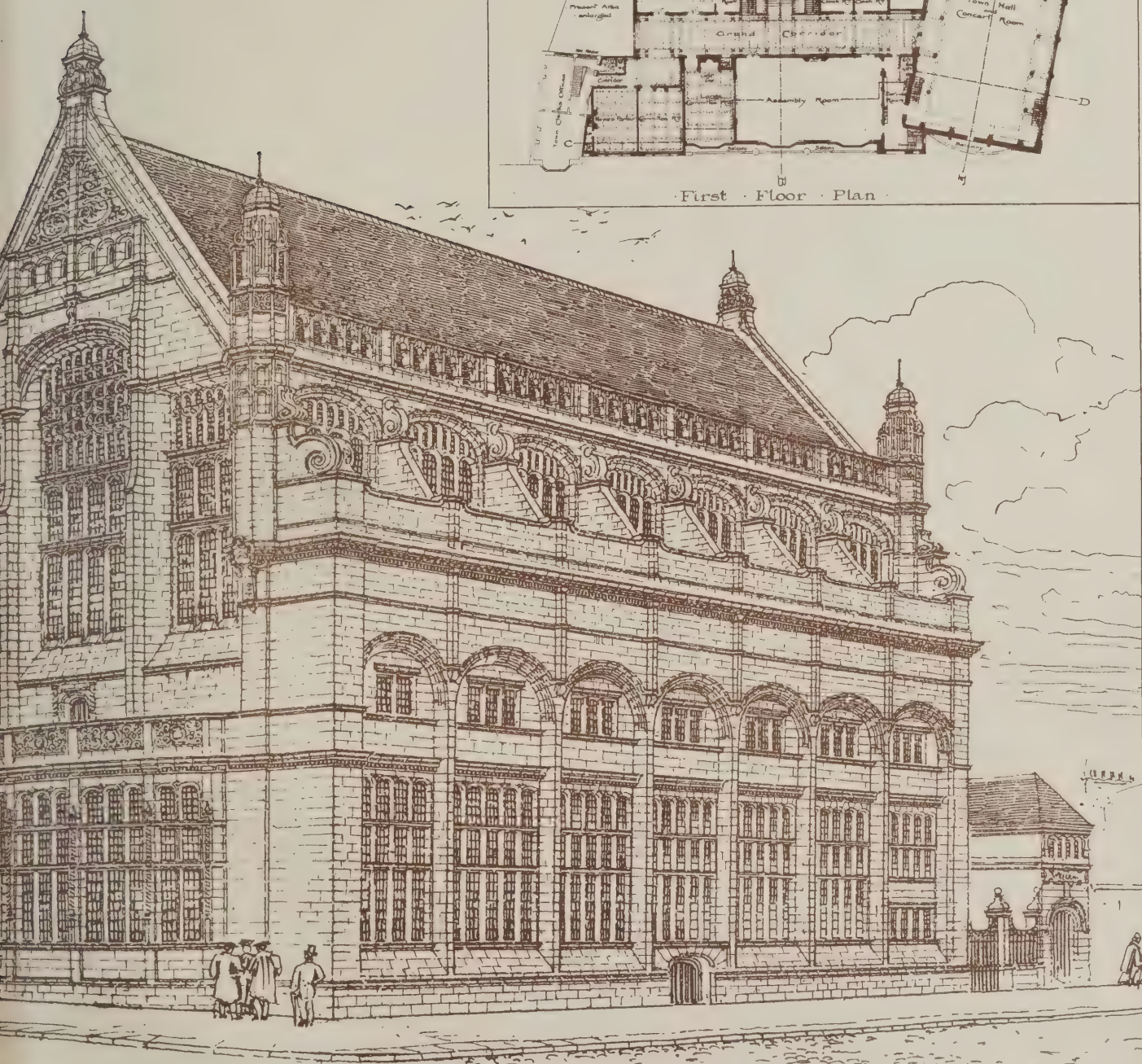
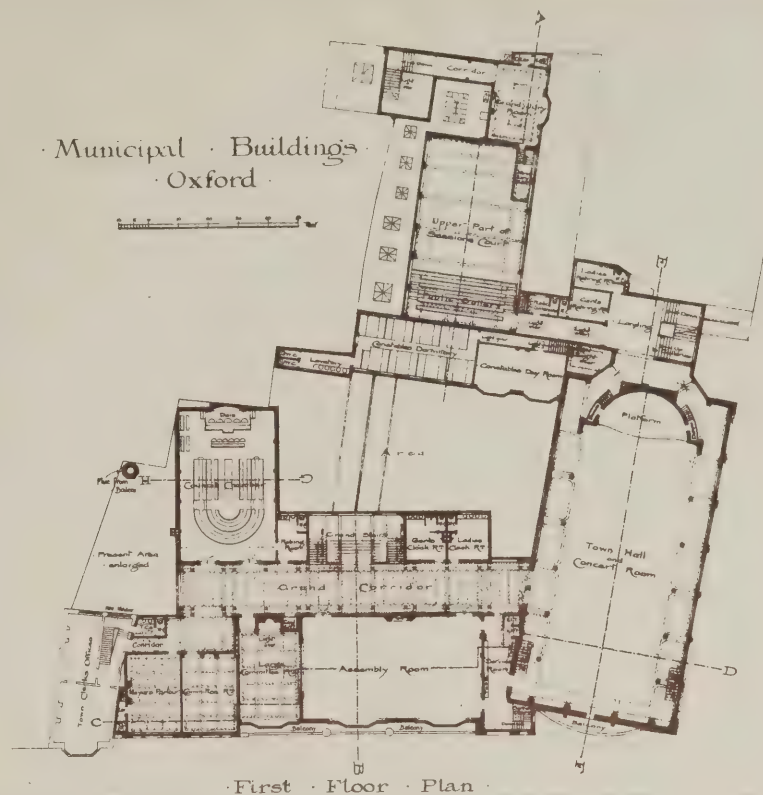
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Buildings ·

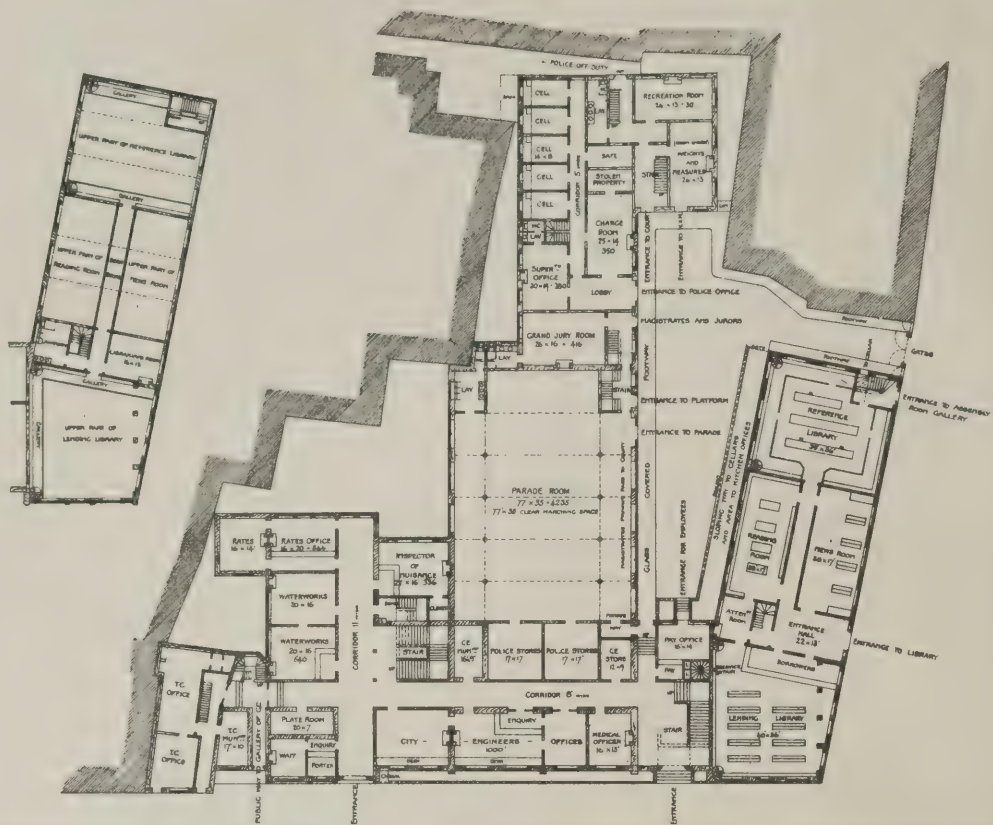
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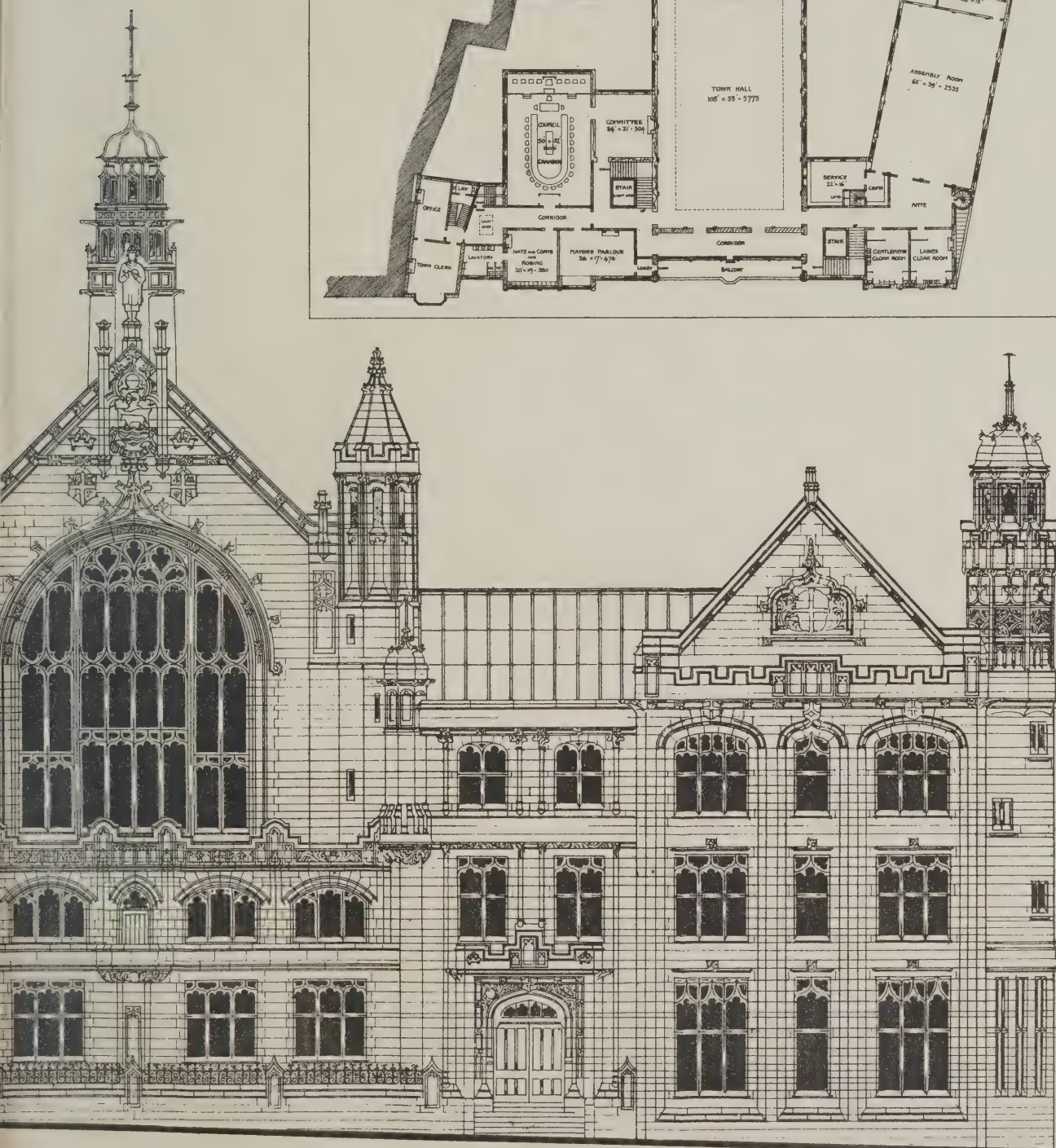


Municipal

DESIGN BY CHARLES



ELL, F.R.I.B.A. ARCHITECT



THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1958.

FRIDAY, JULY 15, 1892.

PROFESSIONAL EXCLUSIVENESS.

AMONG nearly all professions a spirit of exclusiveness prevails. Medical practitioners are probably great sinners in this respect. Their professional societies and institutions are arbitrary and exacting, and if one of their members endeavours to mark out a line of practice for himself, no matter how reasonable it may be, he is at once subjected to an inquisitorial examination, if not summarily ejected from the society of which he may have been a member, and a distinguished one. In the Bar the same exclusiveness holds in the admission and conduct of members. The art of architecture has not hitherto ranked among the "close" professions. Not so very long ago it was looked upon more as an accomplishment. Men like Inigo Jones, Wren, Sir John Vanbrugh the dramatist learned the art not as professional architects, but as amateurs. During this time we might say all the more illustrious names who have done honour to the art were amateurs. Aldrich, D.D., Dean of Christ Church, Oxford, the designer of the beautiful garden front of Corpus Christi College, Sir James Burrough, Master of Caius College, Cambridge, were both eminent amateurs of architecture, whose works, literary and architectural, attest a knowledge of the art as comprehensive and practical as that of any professor. A Lord of the Admiralty, Dr. Clarke, designed the Library of Worcester College, Oxford. Again, we can point to the Earls of Pembroke and Burlington, to Horace Walpole, the pioneer of the Gothic Revival, and the designer of Strawberry Hill; to Beckford, the architect of Fonthill Abbey, who employed James Wyatt to assist him, and to many others, to show that architecture was learned as an art, like music or painting, or any other accomplishments, by private noblemen and gentlemen. We know that men like Wyatt and Nash made names as professional architects; the former studied antiquities at Rome, whither he was taken by Lord Bagot, and also to Venice, and on the death of Sir W. Chambers was made surveyor-general and comptroller of his Majesty's office of works; Nash, according to Britton, was first a miniature painter, and afterwards turned his attention to architecture; according to others he set up as a measuring surveyor and builder. The age in which they practised was one of dilettanteism, and antiquities were more in quest than practical architecture. Those who practised building were generally surveyors; but the modern professional architect came into existence to meet a demand arising out of the requirements of contracts. The exclusive nature of his calling has been increasing from that time to this, and may be said to have been chiefly owing to the separation of building as a distinct business. Previously, architects often united the work of the builder to their own art, as there is ample evidence to prove. With the departure of the age of dilettanti, architecture became a specialised business, and this specialisation is likely to go on increasing as the requirements of buildings become more numerous and complex. We cannot wonder that professionalism has become rampant, and that the amateur element is fast dying out. Architects have banded themselves together into societies, and become organised, the profession has increased vastly in extent and efficiency, the requirements have become greater and more

complicated, and even art itself is better understood. But with these gains the spirit of monopoly and exclusiveness has grown stronger. The profession no longer suffer the amateur to have a voice, as was at one time the habit; they wrap themselves in the garments of their own exclusiveness.

Is this spirit desirable for art? We do not think it is. Interference on the part of the public in matters they are ignorant of is one thing; but intelligent opinion and artistic patronage quite another. The educated and cultured amateur has always been the friend of artists; in the revival of Art in the fifteenth century—in the age of the Medici—princes and nobles and illustrious citizens joined in patronising architects, sculptors, and painters and a whole host of artists, and their patrons were directed by a deep knowledge of classical literature and antiquities, and stimulated by a fervent love of art. We are afraid this sort of patronage has, to a large extent, died out since art has been exclusively followed by individuals who make a living by drawing commissions and percentages. In those days there was a commonwealth in art: those who were gifted were sure of patronage, for there were none of those restricting accidents which now compel the artist or worker to obtain a living by becoming a subordinate to a middleman contractor.

Genius is now fettered by organisation; even the workman, if he is to obtain a fair wage, must become a unionist or must enter a large firm, instead of finding direct patronage; and the painter or the architect, if he wants to make his talents known, must become a member of a society, or await the chances of competition. Unfortunately, it happens that organisations when they attain any position are apt to become cliquish, and to exclude men whose ability is unquestioned, especially if they happen to kick against old fogeyism and undue restraint. Have we not examples of this in every profession; and has not the same spirit of exclusion been seen at the Institute, where those who have been so fortunate as to move in the inner circles of the council are inclined to stubbornly resist any intrusion of new-comers? May we not see it, too, in the eagerness with which fellowship is being guarded; in the resistance lately made against associates by one section of "fellows" who have entered easily themselves, to shut out all others who are seeking for the same rank, and for that purpose to make an examination compulsory? Men of ability have been "black-balled" without justification, and now we have a coterie of members who are determined to narrow the entrance to the Institute by imposing a rigid test even upon those who have been in practice for many years. Thus we have a party, small relatively to the whole, who would narrow the profession to a clique; others who would widen the basis of competent membership by a legislative measure. If we look at the building trades we shall see a similar desire to exclude certain workmen who are not unionists, and those who have gone in for registration, like the plumbers, are, in a less reprehensible manner, seeking to restrict the trade. But what we distinguish is the cliquishness from the constitutional and fair mode of restriction. The former is to band together a few of the fortunate and subscribing members in some representative body or union; the latter is to permit all men to practise or to exercise their vocation who have shown their qualifications before a properly constituted tribunal.

We have thus seen what a different state of things exists now to that of the early time when architecture was an accomplishment like music or painting, and when the profession was freely constituted and freely practised. The results are before us. The buildings of the Renaissance are still models

of excellence which we copy and admire; structurally they are examples of solidity and execution, which even our improved scientific knowledge and technical training and organisation have not succeeded in surpassing. The separation between building and architecture was not so great as it now is, for craftsmanship was joined to artistic callings. In the modern building—the result of contracting—we see a conglomeration of interests: the specification writer and surveyor, whose work is to cut the trades to cost; the contractor, whose interest it is to organise and carry out these trades with a margin of profit, and, lastly, the architect or designer on paper whose efforts are completely controlled and handicapped by the former. Although the whole process of building and design is supposed to be a fully organised combination of architectural skill in which the architect is the head, it is not too much to say that it is a heterogeneous product of distinct and conflicting interests in which separate and often overlapping trades appear. We see in it, often painfully, the exclusiveness and specialisation of which we have been speaking, from the architect downwards. His design on paper has been followed only so far as it can be understood by the contractor, and then only by the light of the contract. Return mouldings and depth, and details not shown clearly are very scrupulously neglected; the quantities have been literally construed without reference to the meaning of the specification, the bricklayer has so mechanically kept to his instructions that he has not given a thought of the requirements of the mason, and the carpenter and joiner and plasterer have each worked at variance with one another, and, in the subsequent trades of fitting up specialities, we detect the same lack of co-operation and unity of purpose between them. We can, so to speak, trace the handiwork of each tradesman who has done his work strictly according to order. No room is allowed for suggestion or discretion, every item is cut and dried, and the "give and take" principle which worked so admirably under the older régime of "measure and value" during ante-contracting days is no longer rendered possible. The narrow, exclusive tendency still continues; each profession and trade is cut up into separate branches which become more and more estranged from each other, much to the advantage of contracts, but to the detriment of architecture.

LONDON BUILDING LAW.

THE suggestions proposed by the Council of the Society of Architects in relation to the London Building Law (Consolidation) Bill, and which at the last meeting were recommended to be submitted to the Local Government Board, are desirable, if rather indefinite and incomplete. We lately noticed some of the suggestions made by the Building Act Committee of the London County Council. We generally expressed our approval of the regulations to insure the minimum strength of flooring joists, access to roof in case of fire, the stability of factory chimney shafts, increased height of habitable rooms, direct ventilation by means of windows for rooms and by skylights and other modes for staircases, and chiefly of the proposal to adopt a rule for regulating open spaces at the rear of buildings. Many other suggested amendments have been made to the Bill by the District Surveyors' Association, the Institute of British Architects, and other bodies.

Referring now more particularly to the report of the Society of Architects, we find the suggestions are ranged under two heads, the "general," and the "particular." Under the former it is proposed that hard and fast rules should be made in preference to optional

rules at the discretion of district surveyors or the County Council. We have always argued that "optional" or "discretionary" powers were somewhat dangerous, as they induced builders and the public to rely too much on the favour and feelings of the board of council. We have seen at least how imperfectly the optional plan of deciding building questions has worked, as, for instance, in the cases of general building lines and height, where very objectionable precedents have been set, which have encouraged speculative builders to expect a great deal more than can in justice to public rights be granted them. That regulations should not necessitate cost in construction may be taken from different points of view. The "jerry" builder would object to every necessary requirement as costly—a concrete layer for site, damp-courses, thick party and other walls, adequate scantlings would be all voted by him as unnecessary and costly, so that the recommendation, however good in theory, would be variously interpreted. With regard to the particular suggestions. As to openings in external walls, the present rule that the "area of such recesses and openings" should not, taken together, exceed *one-half* of the whole area of the wall, is certainly rather restrictive, as recesses as well as openings are taken together in the measurement. The word "recesses" should have been included in the suggested amendment, as it is material. If voids only were intended, as appears in the Society's report, one-half of the area would be tolerable; but when "recesses and openings" are taken together the area is insufficient, and *two-thirds*, as suggested, would not be too much. A schedule of minimum scantlings for joists, girders, beams, columns, and piers would be of undoubted advantage, and would save much of the surveyor's time and trouble; so, too, the suggestion that the party-walls of the warehouse class of buildings should be carried up to 3ft. above the roof may be accepted. Clause 6 of the Consolidation Bill, or 18 and 19 Vic. c. 122 gives only 15in. for height of party-wall above the roof-flat or gutter of the highest adjoining building without any reference to the class of building. The London County Council has suggested that in a building of the warehouse class this height should be at least 2ft. Certainly this is little enough, and 3ft. (measured at right angles, we presume, is intended) is not too much, as any fire-brigade man would say. The sections suggested for dealing with the lighting and ventilating of staircases and habitable rooms are very necessary, and the London County Council have already proposed windows and skylights under clause 12 and 12a. The tailing down of cornices and balconies is one matter deserving attention, which we are glad to see proposed, and it is extraordinary that no provision is made for the structural security of these features which have so often failed with disastrous consequences. The London County Council have strangely passed over this point, and have left it for others to propose.

The projection of oriel windows and turrets is an architectural question that has been raised. No doubt there should be some license given to permit features of this sort under certain regulations if we are to save our new streets from dull monotony. The L.C.C. amendments suggest that in a street of not less than 40ft. in width oriel windows or turrets may be constructed, provided that they do not project more than 3ft. from the front face of wall, or more than 12in. over the public way, and at a certain height above level of footway, and at a distance of 4ft. of the centre of nearest party-wall. It also restricts the width of such feature to one-third the length of the wall. These rules appear to be reasonable, though the distance from party-wall is somewhat unfortunate for architectural effect. It is

proposed by the Society that buildings used for dwellings and for purposes of trade should have the two portions divided by fire-resisting floors and inclosing walls, staircases, and doors. No one can find fault with this separation in the case of buildings used for dwelling and storage—a common occurrence in the metropolis and in all large towns. The L.C.C. have on this point also wisely suggested that all public staircases in churches and chapels, &c., should have inclosing walls of brick, and at least 9in. thick; that corridors and passages for public use shall not be less than 4ft. 6in. wide, and be increased if they communicate with any portion intended to accommodate more than 400 persons by 6in. for every additional hundred. Constructional iron-work it is proposed should be compulsorily incased in fire-resisting materials. We have some doubt whether this rule is absolutely necessary in some buildings, and it would be hard to define what a "fireproof" building should be. For the lower flanges of girders, iron roofs, and columns such incasement would be desirable if there was great risk or inflammable storage.

We cannot endorse the suggestion that the method of regulating the area at the rear of buildings proposed by the L.C.C. would reduce unnecessarily the building capacity of sites where land is valuable. No doubt the area, by the means proposed of allowing an open space of 20ft. between buildings in the rear, and regulating the height of the buildings in the remaining portion of the land by a line drawn at an angle of 45° from the street-level, will be greater than has been allowed in many cases, but certainly not more than is necessary to insure a sanitary result and the prevention of the existing overcrowding. If we are to insure the advantages of a sanitary building law, some slight sacrifice of space is absolutely necessary. We have described the method of regulating the open space at the rear of dwelling houses proposed, and we must say that in spite of some objections to the method in the case of irregular boundaries and corner sites, the plan is less open to objection than others that have been proposed. An open space of not less than 150sq.ft. in the rear of each domestic building is by no means excessive where closets and conveniences are permitted of a certain height (9ft.) The limiting angle of 45° will permit light to the rear of buildings built back to back, a condition which is not now attained on many crowded estates.

We quite agree with the proposals that adjoining owners should be protected against loss by alterations made to party-walls by the building owner for his own advantage, and that small erections such as greenhouses should be exempted from vexatious regulations. At the same time, it is to be hoped that something will be done to stop the intolerable nuisance of the rubbish-burning hot-house, with its low chimney defiling the gardens near. It is a pity the report was not drawn up with more detail, and the council's opinions expressed more fully on some of the above questions, as well as upon others, such as the maximum height of new buildings, height of habitable rooms, the rebuilding of premises burnt or pulled down, the width and construction of public staircases, passages, and doorways, and the definitions of terms used in the Act.

THE "ORDINARY FLOW" OF A RIVER.

OF the several useful purposes of a river, as distinguished from those of beauty and pleasure, the chief one is the outlet it affords all along its course for the drainage of the land at the lowest possible level; but, besides this, if any considerable population have gathered near its head for mining or mercantile purposes, its water affords power

at little expense for mills, and these often supply the wants of a large neighbourhood. Lower down, after tributary streams have joined it, its usefulness for mill purposes becomes less by reason of its decreased rate of fall, while at the same time its volume is increased, so that, with greater outlay, larger mills are established, and lower down still the fall is so much reduced, and the volume and dimensions of the channel so much increased, that the river is used as a waterway for merchandise. In all parts of a river except the highest, its condition in respect of its height and depth of water is the subject of observation from day to day almost. The height of the water at its summer level is marked by vegetation on the piers and abutments of bridges, and the stumps of trees on its banks. This level is that at which the water runs for the longest periods of time. It is most perceptible in summer; but is often seen at other times of the year also where floods have not destroyed the marks. The level of the ordinary flow, however, is not defined by any such marks. It is known pretty well to those who live near the river, or who are in any way particularly interested in its condition at all times of the year, as, for instance, those who make observations for the purposes of water supply to towns, or for its use as power; but it is not defined: there is no ordinary-flow mark, as there is for both lower and higher states of the river. The dry-weather flow, or summer level, is better known, because a river in that condition attracts more attention, and every bare stone or other mark upon the bank is noticed by a hundred eyes—perhaps not every year, but often for several years together; and the general consent as to what is the summer water level seldom varies many inches above or below a level which may be taken as a standard for any part of the river. This is a level somewhat above that to which the water falls occasionally after long droughts when the river runs at its minimum flow. The minimum flow in some years never takes place, and in none does it continue for any length of time, and its level is as much undefined as that of the ordinary flow. In the other direction, that of floods, the highest flood-marks are usually pretty well defined also. Between the two is the height of the ordinary flow. It is hardly worth while to multiply or to require defined conditions of a river further than these three, except that it is necessary for some purposes to know the absolute minimum; for although it may not occur even once in a year, or but seldom, and never for any length of time together, yet it is very desirable to know what it is.

But it is the ordinary flow which governs the chief commercial and other relations of a river. The case is similar to that of the gradients of a railway: a short, steep incline may be surmounted by the locomotive engine, exerted at its full power for a short time beyond its ordinary working power, but the long inclines of lesser gradient, or a succession of short ones, govern the loads which can be taken; and a mill using a stream of water for power is, or should be, proportioned in its motive power to the ordinary flow of the stream.

When we inquire into the water power of streams in general, we find a great want of such observations as would define, with even approximate accuracy, their power for useful purposes; or at least for doing useful work.

In different rivers the ordinary flow bears a different relation to the dry-weather flow and the minimum flow, according to the ground from which the water comes. In some rivers its volume is not much more than twice the dry-weather flow, and is not much higher in level, while in other rivers the level varies so much in a short time that it is almost impossible to say from observation what really is the height of the ordinary flow. Water coming from absorbent rocks, such as chalk,

the oolites, the mountain limestone, and great thicknesses of the millstone grit formation, comes down more regularly throughout the year, and establishes for itself a perennial flow which is both well marked and highly appreciated, especially by millers; while from the non-absorbent rocks, clays, and lias beds the streams descend more suddenly and make it difficult to establish any quantity which can be called the ordinary flow; and yet there is such a thing in these rivers as well as in others, it being that quantity which can be made most use of, excluding alike excessive floods and very low states of the river; but it requires for its determination a greater number of observations in some rivers than in others. Mr. James Leslie proposed, in a paper read at the Institution of Civil Engineers, to divide the annual flow of a river in this wise—First, to set down the whole number of gaugings in the order of their quantities and divide them into four parts, equal in number, the lowest fourth part being the dry-weather flow and the highest fourth part the floods; the average of the middle half then to be ascertained, and all above that average to be rejected as flood water; then a new average to be ascertained by first taking the actual quantities of all the gaugings which do not exceed the first average, and reducing to this average all quantities which exceed it, and then to take the mean of all these as the average volume of the stream. This, however, would seem to be hardly an average, for the average includes all floods, both great and small, and the great ones are of no sort of use in the economy of the river, although the smaller floods are useful as flushes, and in general a flood does no harm until it approaches to the condition of bankfull. In this condition the banks suffer damage by the earth being washed away, allowing the brink to fall into the water, decreasing its depth temporarily, and eventually raising the bed and increasing the height of all floods until one occurs which is strong enough to clear away the deposit by scour, which seldom happens.

The proportion of flood water to the average flow of a river is greater where the watershed area is of an impermeable character, as clay, than where it is absorbent, as sandstone or chalk. In a district consisting mostly of impermeable ground—more or less so—the floods rise rapidly and fall quickly, while in districts of the other kind of ground they run off at a more even rate during a longer time, the rainfall producing the flood being the same in both cases. The watershed area of the river Medlock, which falls into the Irwell below Manchester, is approximately 12,000 acres in extent, mostly clay, and one of the floods which occurred here ran at the rate of 10c.ft. per minute per acre of that area; another one 12·6c.ft., and another 15·1c.ft. per minute per acre. But these are but moderate floods in their rate of flow from such ground. As much as 30 has been measured.

In the Woodhead district of the Manchester Waterworks, a flood occurred which was measured at 17·3c.ft. per minute per acre of the watershed area of 7,000 acres of moorland, the ground being mostly of sandstone and shale. A flood which occurred at the site of the Bilberry reservoir, near Holmfirth, amounted to 16·3c.ft. per minute per acre of the watershed area of 15,400 acres, chiefly of the millstone grit formation, while the average flow at the same place was at the rate of 6c.ft. per minute per acre. In this case the proportion was $2\frac{3}{4}$ to 1, showing the ground to be, for the most part, of an absorbent nature.

Springs sometimes contribute a large quantity of water to the ordinary flow of a river, and none more remarkably than at the upper sources of the Thames in Gloucestershire. The Boxwell spring, at South Cerney, and the Ewen spring, near Ciren-

cester, each yield a million gallons a day. Ampney spring, at Ampney Crucis, two miles east of Cirencester, "an enormous quantity," according to evidence given before the former Water-Supply Commission for the Metropolis, Bibury spring rather more than that at Ampney Crucis; another spring more than two million gallons a day, and another a million and a half gallons. These three are on the Colne, a tributary of the Thames.

All these springs are at an elevation of from 300ft. to 380ft. above the sea, and all contribute to the ordinary flow of the River Thames at one point or another. At the sitting of the commission before named, Mr. Hawksley put in evidence a diagram showing that when a flood rose at Ditton (to come down from the upper portion of the Thames to the lower) to 7,000 million gallons a day, the quantity reduced to 6,000 in 1 day; to 5,000 in 3 days; to 4,000 in 5 days; to 3,000 in 8 days; to 2,000 in 12 days, and to 1,000 million gallons a day in 30 days, after which the reduction in the quantity was at a much less rate, the flood-water having mostly passed off; and, providing that the rain did not continue, the quantity became less by about 31 million gallons for each succeeding period of 30 days, until the minimum of 350 million gallons per day was reached 240 days after the occurrence of the flood of 7,000 million gallons, providing no rain had occurred in the mean time. Another diagram showed the average daily rainfall over the Thames basin during each month from January, 1855, to 1866, and the volume of water discharged each day at Thames Ditton during the same period; from which it is seen that 1,000 million gallons is considerably more than the ordinary flow in almost every one of those years, and probably the ordinary flow would be not more than from 700 to 800 million gallons a day. The way in which the annual average flow of the Thames is stated by Mr. Hawksley is that from 1855 to 1866 two-thirds of the rainfall was evaporated, and one-third was discharged by the river, half of this passing off in floods, the other half being the flow of the springs from the permeable ground of the river basin, which amounts to two-thirds of the whole watershed area above the point of observation. When put in the way of percentages, these proportions are, that 66 per cent. of the rainfall is evaporated, 17 per cent. pass off in floods, and 17 per cent. come from springs. The area of the Thames watershed above the point of observation at Ditton is 3,676 square miles, or 2,352,600 acres. At a meeting of the Institution of Civil Engineers in 1876 Mr. John Taylor, the engineer to the Lambeth Waterworks Company, stated the whole quantity of water which had passed down the river at a point opposite to the intake of the Waterworks at Ditton between the years 1853 and 1875—23 years. Mr. J. T. Harrison gave evidence before the Rivers Commission in 1867 that from the same records during the 11 years 1855 to 1866 the quantity passing down the river was such that it represented an annual average depth over the whole watershed area of 9·4in., and that, as the average annual rainfall during those years was 27·4in., it showed that 18·4in. of this had been evaporated, the difference, 9·4in., being the quantity going down the river. It hardly follows, however, that the whole of the difference of 18·4in. was evaporated. That would be considerably more than the average amount of evaporation in England, which is nearer 14in. Considering the extensive beds of gravel in the Thames Valley below the point of these observations, it is more likely that as much as 3in. or 4in. in depth of the rainfall finds its way underground, and comes to the surface somewhere in the tide-way above or below London.

The average quantity of water passing down the Thames at Ditton during those

eleven years named was 1,350,000,000 gallons a day. The dry-weather flow was 360,000,000. The ordinary flow was about a mean between these two quantities.

THEATRES.

By ERNEST A. E. WOODROW, A.R.I.B.A.

THE question of how best to plan and construct a theatre is a hard one to answer. Within the past few years some writers and many lecturers have laid before the architectural profession and the public, their own and other people's ideas on the subject. Scarcely a paper has been written but some good point can be gathered from it; yet many articles have appeared putting forth theories which have originated in the fertile mind of the author, who displayed a total lack of knowledge of the requirements of a theatre as a place wherein to carry on the business of theatrical entertainment, otherwise such ideas could never have entered his brain. On the other hand, the very small section of the architectural profession who make theatre-building a speciality, has proved by the works actually carried out how theatre planning and theatre construction have made rapid strides of improvement within recent years.

It fell to my lot during the past session of the Architectural Association to read a short paper upon the subject of recent development in theatre planning. I was exceedingly fortunate on that occasion in being able to exhibit, through the kindness of the London architects whose practice lies in theatre work, a collection of theatre plans, such as, I believe, have never been collected together before. Those readers of the BUILDING NEWS who saw those plans will readily endorse my views that theatre planning and construction have made greater progress than that of any other class of building.

In the paper to which I have referred I was unable, on account of the enforced limit necessary, to do justice to my subject, and although, through the invitation of the Editor of the BUILDING NEWS, I have now the opportunity of dealing more fully with the question, yet I cannot hope to comment upon all the points that should be observed when building a place of public entertainment of this character.

Sir E. M. Shaw, in the preface to his second edition of that useful work entitled "Fires in Theatres," says that of all buildings theatres are the most dangerous. People often wonder why theatres are so frequently unfit for the purposes for which they are used. There appear many reasons why the unsafe theatre has arisen—first and foremost, because the majority of architects (with the exception of the specialists who have built theatres) know little or nothing about the requirements of such a building; there is no building requiring more technical knowledge than a theatre, and no building surrounded with such risks from fire. To successfully plan a playhouse, it is necessary to have an intimate knowledge of the whole of the workings of the theatrical business, and as we pass from point to point and from room to room, in these articles, we shall see what a host of detail has to be considered before putting the pencil and T-square on to the drawing-board. Ignorance in the requirements of the plan is one reason why dangerous theatres have been built. Poverty, stinginess, greediness on the part of the manager, and an anxiety to make money, even at the risk of human lives, are other reasons. For example, using materials unfit for the construction of theatres, converting buildings never intended for such a purpose into theatres, and erecting them upon sites unfit to receive them.

It will be remembered that the Gateshead Theatre, which was the only place of public resort in the town, was originally "an ill-built Methodist chapel." The structure was then converted into a music-hall, and finally into a theatre. The unfitness for such a purpose was illustrated by the terrible disaster. It is from such practical lessons as these that the would-be theatrical architect must learn.

Signor Daniele Donghi, an architect of Turin, in a somewhat lengthy pamphlet treating of the safety of theatres in the case of fire, remarks that architects should bear in mind the grave responsibility under which they rest with regard to the construction of a theatre; they should not allow themselves to become the slaves of a theory or of the purse of a parsimonious client, and should not undertake a work if they cannot carry it out

without giving occasion to catastrophe; they should think of their present and future shame, and the crime they would commit in building a defective theatre.

No architect in England can build a theatre without complying with the requirements of the local governing authority, and should he not be thoroughly conversant with theatrical matters, he will find great difficulty in producing a plan which will at one and the same time meet with his client's conditions and the approval of the local authority which has the responsibility of the safety of the public vested in it by Act of Parliament. Architects, therefore, who have theatres to build are more or less encumbered by these difficulties, and my contention is, that unless an architect has a special training in planning such places of public entertainment, he will be surrounded with such difficulties that at times despair will almost overtake him. We live in an age of specialists; we live too fast to permit of time to reflect upon details—they must be at our fingers' ends. The client's time is the client's money, and unless an architect can show that his knowledge will allow him to prepare his plans, and have them approved with despatch, he will be left behind in the rapid race of the age, and it is, therefore, no wonder that the public place special work in the hands of special men; modern requirements demand it.

To obtain the knowledge necessary to make a successful and satisfactory plan, it is needful to acquire an insight into the mysterious workings of the theatre in all its departments. "Commence," it has been said, "in the manager's room if you desire to become a good theatrical architect," and with this I agree. Few, however, can obtain admission to the sacred precincts of the manager's room, or, when there, be admitted into the mysteries of theatrical management. When they have, there is a still greater mystery awaiting them as they descend from the well-appointed office to the vast expanse and seeming confusion of the stage and its machinery. Until an architect has mastered these details it is useless for him to try and build a theatre, for he is sure to meet with failure. He may design a beautiful building as perfectly as possible as far as sound, sight, and safety are concerned, and yet fall far short of perfection from a manager's point of view. Some houses have proved failures because they have been too expensive to work, have required too many attendants, money-takers, and check-takers, and have not held enough "money" to pay the weekly salary list. The auditorium may prove to be too large, or not large enough, for the particular work of the house, a few seats more or less make all the difference in the year's treasury, and may mean failure or success to the manager. The same remarks apply to almost all details of the building. Now these are faults which arise through the lack of experience on the part of the architect.

It is impossible to draw up a hard-and-fast set of rules applicable to all theatres and places of public entertainment; otherwise my present task would be a comparatively light one. Each individual case must be governed by the particular requirements of the class of performance to be given, the class of audience to be entertained, the money to be spent, and the site at the disposal of the client. Unless there is sufficient money and a good site the architect had better not attempt to build. A cheap building is sure to be a bad one—and, of all buildings, theatres should be constructed well, with the very best possible materials suited for the purpose; for until a perfectly fireproof building is produced one cannot assure the public of their safety.

The recent lengthy inquiry of the Select Parliamentary Committee on theatres and music-halls, under the chairmanship of Mr. Plunket, is fresh in the memory of most of us who take any interest in theatrical matters. It is no part of these articles to dwell upon the arguments brought forward by the witnesses and experts examined before this committee, although I may be able to strengthen some of my remarks by reference to important evidence of a purely technical character given by some. We have nothing to do here with questions of licenses, or of what body should be the supreme authority over matters structural or moral. The object of these papers is rather as a series of notes collected for the help of architects who have not, but may have, theatres to build. Far be it from me to dictate or make suggestions to those architects who have distinguished themselves in this complicated branch of the profession; but rather do I hope to help others by

gleaning from the information that has in one form or another been laid before the public. The majority of this information is scattered about in the form of lectures, newspaper articles, and public letters; the works on theatrical architecture are few and far between. Some of the greatest help can, I contend, be obtained by a judicious study of the rules and regulations enforced at home and abroad, and it appears to me that it will be a wise course to pursue if I make full references to these, as we consider the requirements of a theatre.

So far as the public are concerned, there are many people who would far rather not know of the danger that surrounds them, and whose natural nervousness alone would create a feeling of panic; but it has been rightly said that such nervousness is caused by a knowledge wholly senseless and worthless—it can never by any possibility do good, and may do harm. These are the views of the greatest authority in such matters, Sir Eyre M. Shaw. The architect must be fully alive to all the dangers, and, armed with a knowledge of them, he must seek means to overcome them. It is only by studying the cause of the accidents which have happened that we can hope to find the remedy. I believe in practical lessons from actual events, more than the theoretical lessons delivered from the lecture platform.

The conservative character of the theatrical manager is well known, and the architect who is desirous of introducing reforms and improvements in the arrangement or construction of theatres must be warned against disappointment, for in many cases he will meet with little encouragement; but, for all that, there are managers who have shown a desire to advance with the times, and although it is perhaps somewhat invidious to refer to names and buildings in articles of this character, one cannot help reminding one's readers of the marvellous advancement in constructive detail shown in Mr. D'Oyly Carte's Royal English Opera House, and in the theatres erected in the West End by Mr. Phipps and Mr. Emden.

Speaking of the advancement in the safety of the structures of the London theatres, the Select Committee reported to the House that the credit of this was no doubt mainly due to the zealous efforts, first, of the Metropolitan Board of Works, and afterwards of the London County Council, working through the Theatres Committee. There is more truth in this than at first meets the eye, for it is certain that the improvement in the construction of theatres has arisen since the passing of the Metropolitan Management and Building Acts Amendment Act in 1878, which gave the Metropolitan Board and the London County Council their powers over the construction of theatres.

Before commencing to dwell upon the details of the question, I have one or two general remarks to make. The safety and comfort of the audience must be observed in designing a theatre. A house must be provided in which the performance can be seen and heard from every seat, whether it be a sixpenny gallery or a guinea stall; the auditorium must be designed so that every member of the audience can speedily obtain access to the street, and materials of fireproof nature must be used to form a building in which the public can feel secure.

The provisions for the comfort and safety of the performers until late years have been but small. There, however, now appears to be more public demand for the better protection of the artists who are the exponents of one of the highest arts.

The key-notes for perfect planning in theatres are simplicity, compactness, uniformity, and order, having due regard for economy of space, yet providing a place for everything and ample room for everybody.

Panic is so closely associated with theatres that making provisions to lessen the chances of its awful consequences is obviously one of the greatest aims the architect must have in view. No man can plan a building in which it is absolutely certain no danger will arise from panic. A stampede can take place in the open air. It cannot be eradicated by the number of exits, the width of the staircases, the pattern of the door fastenings, the number of fire-buckets, or the fireproof construction of the building. The only certain means of absolutely preventing panic would be to educate each individual member of the audience to maintain self-control; but where the audience know that they are well protected, where they

know the position of the exits, that the building is fireproof, that the management is a good one, that the fire watch is well organised, the chances of panic are lessened, and people will be less nervous, less likely to jump up at the least sound or cry out at the sight of a slight accident.

I mentioned "management," and maintain that good "management" in a theatre can do even more than the architect, and a bad "management" can, and sometimes does, destroy many of the provisions the architect has made for the public safety. When I speak of good management, I mean where the acting manager sees personally to all such details as the competency of the fire-watch, the efficiency of the fire-extinguishing appliances; where he does not allow overcrowding in the auditorium, the obstruction of passages or gangways, or the fastening of doors during the performance; where he prohibits the keeping of large stocks of scenery on the premises, or the placing of things and materials in other places than those purposely provided for them; where he personally examines daily, and every evening before and after the performance, every nook and corner of the house. Bad management is the reverse of this. A perfectly-built theatre can become a death trap from the effects of an escaping gas-pipe, a locked door, a loose pay-box, a dummy fire-watch, an obstructed passage-way. Badly-built theatres can be made to a certain degree satisfactory with good management, but can never be made safe from fire. An architect may leave a good building, and the management so abuse it as to render it practically unsafe; but architects, when they build, naturally expect the building to be properly managed.

PRICES.*—XL.

(All Prices Include Profit.)

IRONMONGER (continued).

LOCKS, including fixing—

6in. 2-bolt rim lock, with Wilkes', brass furniture, complete	each	£	s.	d.
Ditto better quality, brass bolts, and scotch spring	ditto	0	3	6
Ditto brass bushed and heavy	ditto	0	4	0
Ditto with cast brass knobs to handles and patent spindle	ditto	0	4	9
Ditto with 7in. furniture, of same quality as last	ditto	0	5	0
Ditto narrow case rim lock, brass bolts, no furniture	ditto	0	3	6
Ditto stamped steel case, no furniture, brass bolts	ditto	0	3	9
Ditto cast case, rim lock, Elizabethan design, no furniture, brass bolts	ditto	0	3	6
Ditto best quality, 6in., no furniture	ditto	0	3	6
Ditto ditto 7in. ditto	ditto	0	4	0
Ditto ditto 8in. ditto	ditto	0	5	0
Ditto 2-lever, no furniture, with two nickelled keys	ditto	0	4	0

For patent locks of all kinds—Bramah, Chubb, Hobbs, Tucker and Reeves, &c.—see further on.

5in. brass rim locks, Gothic pattern	each	0	8	0
6 ditto ditto	ditto	0	8	9
6 ditto plain	ditto	0	7	6
6 ditto ditto	ditto	0	8	0
4in. dead locks, wrought-iron bolts	ditto	0	2	6
5 ditto ditto	ditto	0	2	9
6 ditto ditto	ditto	0	3	0
4 ditto brass bushed	ditto	0	2	9
5 ditto ditto	ditto	0	3	0
6 ditto ditto	ditto	0	3	4
4 ditto ditto and with brass bolts	ditto	0	3	0
5 ditto ditto ditto	ditto	0	3	3
6 ditto ditto ditto	ditto	0	3	8
6 ditto stamped steel case, and extra wide and strong bolt	ditto	0	3	10
6 ditto with extra strong cases	ditto	0	4	0
7 ditto ditto	ditto	0	4	9
8 ditto ditto	ditto	0	5	9
6in. 4-lever, with brass bolts and patent stop	ditto	0	9	0
7in. draw-back lock, fine ward, open plate, one bolt	ditto	0	3	6
8 ditto ditto	ditto	0	3	9
9 ditto ditto	ditto	0	4	6
7 ditto medium quality	ditto	0	4	0
8 ditto ditto	ditto	0	4	3
9 ditto ditto	ditto	0	4	9
7 ditto brass bushed and strong	ditto	0	4	6
8 ditto ditto ditto	ditto	0	4	10
9 ditto ditto ditto	ditto	0	5	9
7 ditto with 2 bolts, well made	ditto	0	6	0
8 ditto ditto	ditto	0	7	0
9 ditto ditto	ditto	0	8	8
10 ditto ditto	ditto	0	10	0
7in. stock lock, common quality	ditto	0	2	9
8 ditto ditto	ditto	0	2	11
9 ditto ditto	ditto	0	3	2

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Strong stock lock, brass bushed, and medium quality		£	s.	d.
8	ditto	0	3	3
8	ditto	0	3	6
9	ditto	0	3	9
9	ditto with Gothic plates and varnished case	0	4	0
9	ditto	0	4	3
9	ditto	0	4	8
7in. Lancashire stock lock, very strong	ditto	0	5	0
8	ditto	0	5	6
9	ditto	0	6	0
MORTISE LOCKS, no furniture, but fixed—				
5in. japanned case, with reversible bolts	ditto	0	4	0
6	ditto	0	4	3
6	ditto and brass bolts	0	4	3
6	ditto	0	4	6
6in. wedge-shaped, japanned case	ditto	0	4	0
6in. bright case, and shifting bolts	ditto	0	4	6
6in. ditto brass bolts and brass bushed	ditto	0	5	0
6in. 2-lever, bright case, &c.	ditto	0	5	6
6in. ditto ditto brass bolts	ditto	0	5	9
7in. ditto iron bolts	ditto	0	6	0
6in. ditto brass bolts	ditto	0	6	6
6in. 4-lever, shifting bolts, well made	ditto	0	9	0
6in. ditto brass bolts	ditto	0	9	9
7in. ditto	ditto	0	10	0
6in. ditto brass bolts	ditto	0	10	9
6in. centre bit, japanned case	ditto	0	4	0
6in. ditto ditto brass bolts	ditto	0	4	3
6in. 1-lever and spring, with reversible bolts, well made, and brass bolts	ditto	0	4	9
6in. ditto with iron bolts	ditto	0	4	6
6in. ditto 1-bolt lock	ditto	0	4	0
6in. ditto ditto brass-bolt lock	ditto	0	4	4
6in. 2-lever, half-rebated, with two bolts and palace motion and shifting bolts	ditto	0	8	0
6in. ditto best finish, and brass bolts	ditto	0	8	9
6in. 2-lever, full rebated, with iron bolts, steel follower, and shifting bolts	ditto	0	10	6
6in. ditto best finish, and with brass bolts	ditto	0	11	6
6in. roller bolt, with bright case, brass bushed, to work either hand	ditto	0	6	0
"Biggs" patent centre-bit lock, fixed with one centre-bit hole, with 2 keys	ditto	0	5	0
Mortise sash dead-lock, plain	ditto	0	3	6
6in. ditto half rebated	ditto	0	4	0
6in. ditto full ditto	ditto	0	6	6
6in. ditto brass bolts extra	ditto	0	0	3
6in. Mortise sash latch, plain	ditto	0	3	3
6in. ditto half rebated	ditto	0	3	8
6in. ditto full ditto	ditto	0	5	9
6in. ditto brass bolts extra	ditto	0	0	3
6in. Full rebated sash lock (no furniture)	ditto	0	7	0
6in. ditto half ditto	ditto	0	5	0
6in. 2-bolt sash lock (no furniture)	ditto	0	4	6
6in. ditto medium quality	ditto	0	5	6
6in. ditto good ditto	ditto	0	6	0
6in. ditto brass bolts extra	ditto	0	0	3
3in. brass sliding-door lock to spring, with follower, and secured by lock-up bolt, gunmetal key	ditto	0	7	0
3in. ditto ditto	ditto	0	7	6
3in. ditto ditto	ditto	0	8	4
GATE LOCKS, including fixing in wood—				
4 by 4 japanned rim, dead, with wrought-iron case	ditto	0	3	6
6in. ditto ditto draw back one bolt	ditto	0	8	10
6in. ditto ditto strong with solid wards	ditto	0	4	6
6in. Flanged draw-back gate lock, 1 bolt, and riveting to iron gate	ditto	0	5	0
6in. ditto strong ditto	ditto	0	5	9
6in. ditto brass bolts extra	ditto	0	0	4
NIGHT LATCHES, and fixing—				
Common japanned	ditto	0	3	0
6in. ditto 2-handed, brass-bushed, and iron bolts	ditto	0	3	6
6in. ditto ditto brass bolts	ditto	0	3	9
6in. Sash night latches for narrow stiles, iron bolt	ditto	0	4	6
6in. ditto lever, and brass bolts	ditto	0	6	0
6in. Strong latch with brass bolts, block both sides	ditto	0	4	9
6in. 2-lever, brass bolt, milled knob, well finished, and nickelled keys	ditto	0	4	6
6in. 4-lever cut latch, brass cut, brass bolt, and short pin key	ditto	0	6	9
6in. Ditto rim, best, with solid knob, riveted to bolt	ditto	0	6	0
6in. Bright-case mortise latch, 2-lever, good quality	ditto	0	7	0
6in. Half set of furniture extra	ditto	0	0	9
6in. All-brass latch, 2-lever, Scotch, spring well finished	ditto	0	6	0
6in. Ditto ditto nickel-plated	ditto	0	7	0
W.C. AND OTHER LATCHES, fixed—				
4in. common bow latch, with common brass furniture	ditto	0	1	4
4in. ditto ditto	ditto	0	1	6
4in. 2-bolt ditto	ditto	0	1	6
4in. ditto ditto	ditto	0	1	8
4in. ditto ditto	ditto	0	2	0
4in. boxed or rim bow latch	ditto	0	2	0
4in. ditto ditto	ditto	0	2	2
4in. rim latch and bolts	ditto	0	2	0
4in. ditto ditto strong, with brass bushings	ditto	0	2	0
4in. Japanned steel rim latch with wrought case	ditto	0	2	0
6in. ditto with brass bolt	ditto	0	2	2
6in. Polished brass	ditto	0	3	6
6in. ditto brass bolts	ditto	0	3	9
6in. Rim latch, cast case	ditto	0	2	3
6in. ditto brass bolt	ditto	0	2	6
6in. Brass pulpit latch, with brass furniture and iron bolts	ditto	0	3	3
6in. ditto all brass	ditto	0	4	0
6in. ditto, best quality, brass throughout, with furniture	ditto	0	4	6
6in. ditto prepared for China furniture	ditto	0	4	8
6in. ditto all brass, with ornamental case, strong and good	ditto	0	4	0
6in. ditto nickel-plated	ditto	0	4	6
6in. 2 shutter or secret latch	ditto	0	2	6
6in. 2 ditto ditto	ditto	0	2	9
CUPBOARD LOCKS—				
Iron with iron bolts	each	0	1	3
6in. Ditto brass bolts	ditto	0	1	5
6in. Ditto ditto ditto and strong	ditto	0	1	9
6in. Ditto screw back and brass bolts	ditto	0	2	6
6in. 1 1/2 in. all brass, double-handed, 1-lever	ditto	0	1	10
6in. Ditto ditto ditto	ditto	0	2	0
6in. Ditto ditto ditto	ditto	0	2	3
6in. 2in. ditto ditto	ditto	0	2	0
6in. Ditto ditto ditto	ditto	0	2	3
6in. Ditto ditto ditto	ditto	0	2	5
6in. 2 1/2 in. ditto ditto	ditto	0	2	6
6in. Ditto ditto ditto	ditto	0	2	9
6in. Ditto ditto ditto	ditto	0	2	11
6in. 3in. ditto ditto	ditto	0	2	7
6in. Ditto ditto ditto	ditto	0	2	10
6in. Ditto ditto ditto	ditto	0	3	0
6in. 3 1/2 in. ditto ditto	ditto	0	2	8
6in. Ditto ditto ditto	ditto	0	2	10
6in. 4 in. ditto ditto	ditto	0	3	0
All brass, 2-lever cupboard—				
6in. 1 1/2 in. 2-lever	ditto	0	1	9
6in. Ditto 4 ditto	ditto	0	2	4
6in. 2in. 2 ditto	ditto	0	1	10
6in. Ditto 4 ditto	ditto	0	2	6
6in. 2 1/2 in. 2 ditto	ditto	0	1	11
6in. Ditto 4 ditto	ditto	0	2	6
6in. 3in. 2 ditto	ditto	0	2	0
6in. Ditto 4 ditto	ditto	0	2	10
6in. 3 1/2 in. 2 ditto	ditto	0	2	2
6in. Ditto 4 ditto	ditto	0	2	6
TILL LOCKS and fixing—				
6in. to 2 1/2 in. 1-lever, all brass	ditto	0	1	9
6in. Ditto 2 ditto	ditto	0	2	0
6in. Ditto 4 ditto	ditto	0	2	5
6in. Iron till locks, bright case, and copper wheels	ditto	0	1	3
6in. Ditto 3 wheel and cap ward	ditto	0	1	5
6in. Ditto brass back	ditto	0	1	8
6in. Ditto extra strong	ditto	0	1	10
DESK LOCKS AND BOX LOCKS, fixed—				
6in. 2-lever, brass	each	0	2	6
6in. Ditto 4 ditto ditto	ditto	0	3	0
6in. 2 in. 2 ditto ditto	ditto	0	2	9
6in. Ditto 4 ditto ditto	ditto	0	3	3
6in. 1 1/2 in. to 3in. 1-lever, sloping	ditto	0	2	6
6in. Ditto 2 ditto ditto	ditto	0	2	10
6in. Ditto 1 ditto camp	ditto	0	3	0
6in. Ditto 2 ditto ditto	ditto	0	3	6
CHEST LOCKS—				
Japanned case	ditto	0	1	2
6in. Ditto 2 brass wheels	ditto	0	1	4
6in. Ditto 4 ditto	ditto	0	1	6
6in. Bright ditto strong	ditto	0	1	9
6in. Ditto ditto to spring	ditto	0	2	0
PADLOCKS, not fixed—				
Japanned tumbler, bushed	ditto	0	0	9
6in. Ditto double plated, bushed, barred, and wheeled	ditto	0	1	2
6in. Galvanised, with brass shackle and rivets and brass wards	ditto	0	1	9
6in. Galvanised 2-lever	ditto	0	2	6
6in. Barron's patent, with large shackle, brass wards, and rivets, &c.	ditto	0	2	10
6in. Squire's galvanised or japanned, 2in.	ditto	0	2	0
6in. 2in. ditto "Invincible," self-locking lever	ditto	0	2	4
6in. 2 1/2 in. ditto ditto	ditto	0	2	8
6in. 3 in. ditto ditto	ditto	0	3	0
6in. 3 1/2 in. ditto ditto	ditto	0	3	4
6in. 4 in. ditto ditto	ditto	0	4	2
6in. 4 1/2 in. ditto ditto	ditto	0	4	6
6in. 5 in. ditto ditto	ditto	0	5	0
6in. 5 1/2 in. ditto ditto	ditto	0	5	4
6in. 6 in. ditto ditto	ditto	0	6	0
6in. 6 1/2 in. ditto ditto	ditto	0	6	4
6in. 7 in. ditto ditto	ditto	0	7	0
6in. 7 1/2 in. ditto ditto	ditto	0	7	4
6in. 8 in. ditto ditto	ditto	0	8	0
6in. 8 1/2 in. ditto ditto	ditto	0	8	4
6in. 9 in. ditto ditto	ditto	0	9	0
6in. 9 1/2 in. ditto ditto	ditto	0	9	4
6in. 10 in. ditto ditto	ditto	0	10	0
6in. 10 1/2 in. ditto ditto	ditto	0	10	4
6in. 11 in. ditto ditto	ditto	0	11	0
6in. 11 1/2 in. ditto ditto	ditto	0	11	4
6in. 12 in. ditto ditto	ditto	0	12	0
6in. 12 1/2 in. ditto ditto	ditto	0	12	4
6in. 13 in. ditto ditto	ditto	0	13	0
6in. 13 1/2 in. ditto ditto	ditto	0	13	4
6in. 14 in. ditto ditto	ditto	0	14	0
6in. 14 1/2 in. ditto ditto	ditto	0	14	4
6in. 15 in. ditto ditto	ditto	0	15	0
6in. 15 1/2 in. ditto ditto	ditto	0	15	4
6in. 16 in. ditto ditto	ditto	0	16	0
6in. 16 1/2 in. ditto ditto	ditto	0	16	4
6in. 17 in. ditto ditto	ditto	0	17	0
6in. 17 1/2 in. ditto ditto	ditto	0	17	4
6in. 18 in. ditto ditto	ditto	0	18	0
6in. 18 1/2 in. ditto ditto	ditto	0	18	4
6in. 19 in. ditto ditto	ditto	0	19	0
6in. 19 1/2 in. ditto ditto	ditto	0	19	4
6in. 20 in. ditto ditto	ditto	0	20	0
6in. 20 1/2 in. ditto ditto	ditto	0	20	4
6in. 21 in. ditto ditto	ditto	0	21	0
6in. 21 1/2 in. ditto ditto	ditto	0	21	4
6in. 22 in. ditto ditto	ditto	0	22	0
6in. 22 1/2 in. ditto ditto	ditto	0	22	4
6in. 23 in. ditto ditto	ditto	0	23	0
6in. 23 1/2 in. ditto ditto	ditto	0	23	4
6in. 24 in. ditto ditto	ditto	0	24	0
6in. 24 1/2 in. ditto ditto	ditto	0	24	4
6in. 25 in. ditto ditto	ditto	0	25	0
6in. 25 1/2 in. ditto ditto	ditto	0	25	4
6in. 26 in. ditto ditto	ditto	0	26	0
6in. 26 1/2 in. ditto ditto	ditto	0	26	4
6in. 27 in. ditto ditto	ditto	0	27	0
6in. 27 1/2 in. ditto ditto	ditto	0	27	4
6in. 28 in. ditto ditto	ditto	0	28	0
6in. 28 1/2 in. ditto ditto	ditto	0	28	4
6in. 29 in. ditto ditto	ditto	0	29	0
6in. 29 1/2 in. ditto ditto	ditto	0	29	4
6in. 30 in. ditto ditto	ditto	0	30	0
6in. 30 1/2 in. ditto ditto	ditto	0	30	4
6in. 31 in. ditto ditto	ditto	0	31	0
6in. 31 1/2 in. ditto ditto	ditto	0	31	4
6in. 32 in. ditto ditto	ditto	0	32	0
6in. 32 1/2 in. ditto ditto	ditto	0	32	4
6in. 33 in. ditto ditto	ditto	0	33	0
6in. 33 1/2 in. ditto ditto	ditto	0	33	4
6in. 34 in. ditto ditto	ditto	0	34	0
6in. 34 1/2 in. ditto ditto	ditto	0	34	4
6in. 35 in. ditto ditto	ditto	0	35	0
6in. 35 1/2 in. ditto ditto	ditto	0	35	4
6in. 36 in. ditto ditto	ditto	0	36	0
6in. 36 1/2 in. ditto ditto	ditto	0	36	4
6in. 37 in. ditto ditto	ditto	0	37	0
6in. 37 1/2 in. ditto ditto	ditto	0	37	4
6in. 38 in. ditto ditto	ditto	0	38	0
6in. 38 1/2 in. ditto ditto	ditto	0	38	4
6in. 39 in. ditto ditto	ditto	0	39	0
6in. 39 1/2 in. ditto ditto	ditto	0	39	4
6in. 40 in. ditto ditto	ditto	0	40	0
6in. 40 1/2 in. ditto ditto	ditto	0	40	4
6in. 41 in. ditto ditto	ditto	0	41	0
6in. 41 1/2 in. ditto ditto	ditto	0	41	4
6in. 42 in. ditto ditto	ditto	0	42	0
6in. 42 1/2 in. ditto ditto	ditto	0	42	4
6in. 43 in. ditto ditto	ditto	0	43	0
6in. 43 1/2 in. ditto ditto	ditto	0	43	4
6in. 44 in. ditto ditto	ditto	0	44	0
6in. 44 1/2 in. ditto ditto	ditto	0	44	4
6in. 45 in. ditto ditto	ditto	0	45	0
6in. 45 1/2 in. ditto ditto	ditto	0	45	4
6in. 46 in. ditto ditto	ditto	0	46	0
6in. 46 1/2 in. ditto ditto	ditto	0	46	4
6in. 47 in. ditto ditto	ditto	0	47	0
6in. 47 1/2 in. ditto ditto	ditto	0	47	4
6in. 48 in. ditto ditto	ditto	0	48	0
6in. 48 1/2 in. dit				

THE CONSTRUCTION AND INTERIOR
ARRANGEMENT OF THEATRES.*

TEN years ago I read a communication before the Institute "On the Prevention of Fires in Theatres," which was generally applicable to the theatres of our country. I have been called upon by your Committee on Meetings to say a few words on the same subject to-night, but more specifically in regard to local conditions. My remarks of ten years ago appeared in the *Journal*, and the matter seemed of such importance to the Institute that a special committee, with myself as chairman, was appointed to investigate and suggest better features in our American theatres. Although not as much good as we had anticipated resulted from our labours (embodied in a printed report), we at least had the satisfaction of knowing that many of our suggestions were adopted in the ratings and schedules of underwriters; some, which had been deemed as impracticable by stage carpenters, have been introduced, and are now regularly in use in a number of places of amusement. It is difficult to achieve progress of any kind where a decided material return is not in view for the money expended. Allow me to rapidly make a few suggestions which are no longer novel, recapitulating much that I have said on former occasions, before proceeding to what is new and of local importance. A theatre should consist of four separate and distinct buildings, like the Park Theatre, separated by substantial brick walls

* By C. JOHN HEXAMER. Read at a recent meeting of the Franklin Institute, Philadelphia, U.S.A.

rising above the roofs, all communications to be cut off by the best known fire-resisting means. [The Park Theatre is, however, not a fireproof structure, although in its general plan the most rationally designed of all our Philadelphia play-houses, and should it at any time burn down, do not accuse me of the statement that it was fireproof!] 1. There should be a fireproof auditorium (as fireproof office buildings are now constructed). 2. A stage building. 3. A fireproof building for dressing-rooms, &c. 4. A fireproof storage room for scenery, properties, &c., with fireproof doors. The proscenium wall should rise well above the roofs of all the buildings, with an iron girder covered by a good non-conductor, relieved by an arch, the weight of the wall above being sustained by the arch, so that if the girder gives way, by exposure to the intense heat of the fire, the wall will remain in place. Designers and managers usually prefer to close off the stage opening, square at the top. Where this is not desired the girder should be dispensed with. The wall should cut the stage-floor with incombustible material. When several years ago the Academy of Music was improved, I again made this suggestion (this had previously been decried as an absurdity and practical impossibility), which was carried out, and has been in use since without annoyance or inconvenience of any kind. The wooden stage floor was cut, the wall being "brought up" near the level of the stage floor, and was finished off on the top with a heavy coat of cement which, when dry, corresponded in colour with the wooden floor, and it is not noticeable from the auditorium. Instead of being disagreeable to dancers, I was informed by the late Mr. Higbee that the *premieres* selected the smooth, hard cement pavement for their *tour de force*. It is self-evident that where the wooden stage-floor is unbroken by an incombustible barrier, fires will be transmitted beneath the fire curtain from the stage to the auditorium. The curtain should be of real asbestos, not half-cotton, with an interior network of strong, woven, pliable wire to give it tensile strength, and should slide in iron grooves, at least 6 in. deep on both sides of the stage, securely bolted into the masonry of the proscenium wall. All of the four buildings should be provided with large, separate exits to the open air. Every part of the auditorium should have separate exits, and the exit of one part should never be allowed to discharge into that of another. All corridors should increase in width from the theatre to the open air. All extra exits (fire corridors) should be marked as such in large, bold letters; should be lighted by oil-lamps (not petroleum products; sperm or lard oil is recommended), and should be unbarred from the opening of the theatre until it is closed. Before the close of every performance they should be opened, so that the exits may become known to the public. All doors should open outwards (a precaution which is still neglected in some of our concert club-halls). Long rows of seats should not be permitted. Rows should be cut by aisles at short intervals. Movable seats should not be allowed. Seats should be tightly screwed to the floor. Fixed chairs with a spring attachment, which throws back the seats when not occupied, are strongly recommended. No scenery, property, materials, or impediments or any description should be allowed to remain in the corridors. The fire-proof drop-curtain should be kept down at all times except during rehearsals and performances; after which it should be immediately let down, and not raised until a few minutes before the beginning of the next performance. The lowering apparatus should be so arranged that the curtain will be lowered automatically in case of fire. Doors in fire-walls should have stone sills, and should be fire-lined on both sides, constructed according to the underwriters' specifications, without springs or locks, so they can readily be opened. Incandescent electric lights should be used throughout, and all others should be prohibited on the stage. The system of lighting the stage should be separated from that of lighting the auditorium—each should have a distinct circuit. The system should be installed under the direction of the electric-light inspector of the Fire Underwriters' Association. An ordinance should prohibit the use of lights until so approved and the certificate of approval has been issued, and a fine of 1,000dols. for each offence should be imposed. Should managers be satisfied in placing electric lights like gas-lights, and leaving them in place

as they usually do the latter, there would be little danger from incandescent lights which have been inspected and passed; but electric lights are so easily moved, and the novel scenic effects which can be contrived with them are so tempting, that these are frequently rearranged, and this practice becomes exceedingly dangerous when carried on by ignorant persons, therefore expert supervision is most necessary. It seems clearly established that the recent Central Theatre fire was caused by a gas-light, which would have been impossible had electric incandescent lights been used exclusively. It may not be uninteresting to quote here what we advocated ten years ago:—"The greatest number of fires are caused by the paraphernalia of illumination. The danger of coal oil, which is much used in our country and Western theatres as an illuminating agent, is self-evident, but the hazards of gas, which until within a few years was the safest material at our command, are not so well understood. Besides the dangers of leakage and explosions, we have, in the case of illumination, hundreds of flames spread throughout a building, each forming a dangerous sphere around itself. Although the last-named dangers can and should be lessened by proper precautions, such as wire baskets and shields over the flames, still, when we consider the close proximity of the border lights to combustible gauzes and canvas, and ponder on the hazards of temporary illuminating effects, where jets are fed through rubber hose which must be removed during change of scene, we must ask is there no other method of illuminating by which equally good artistic effects may be produced, and which at the same time will lessen or entirely do away with the hazards of the present system? Fortunately means are now at hand. By the labour of eminent electricians, we have at our disposal an agent by which the same, if not more brilliant, effects than with gas can be produced, while doing away with the dangers of gas, the lamps themselves being absolutely safe, &c. Where electricity is generated in the theatres, the boilers, engine, and dynamo should not be located in the stage building, and lights in stairways should receive their currents from outside independent sources. A large reservoir, the bottom at least 10ft. above the highest sprinkler, holding at least 5,000 gallons, should be introduced. It should always be kept full of water, connecting with the standpipes, and not allowed to freeze. (This can easily be accomplished by passing the exhaust steam-pipe through it.) Every theatre should be supplied with a sufficient number of fire-hydrants, connected with the tank, with hose and nozzle attached ready for instant use and not removable. The tank connection is important, as the city water pressure is so feeble in some districts (having been found by actual tests to be as low as 20lb. and 26lb.), that it would be impossible to squirt to the top of the stage with the appliances now in use in some play-houses. The stage and workshops, and if there is an attic above the auditorium, this also, should be fully equipped with an approved system of automatic sprinklers, connected with two supplies, an approved pump and tank, both of which should be located outside of the stage building. Automatic apparatus is worthless unless in perfect working order, and should, therefore, frequently be carefully inspected, tested, and reported upon. The following underwriters' report on the sprinkler system of one of our theatres will give you an idea how this should be done; also of the necessity of laws, official municipal inspections, and fines for neglect in these matters. [I withhold the name of the theatre.] "*System; Wet Pipe; Equipment.*—Full protection under roof, gridiron, fly galleries, and stage. *Water Supply.*—4,000-gallon tank on roof. Bottom of tank is elevated 10ft. above highest sprinklers. Tank is filled by steam pump, and has steam pipe inside. *Condition of Equipment.*—Fair. Rising main is 3in. Pipe sizes are correct. Check valve at tank to operate automatic alarm, which is located on stage and in good order. Pet cocks in upper part of system. No city water or pump connections for supply. No hose attached to sprinkler system. Draw-off pipe approved. *Remarks.*—The water in tank has been repeatedly found low and frozen, and it is evident that proper attention is not given to the sprinkler system. We, therefore, rescind the sprinkler allowance until further notice. A sufficient number of fire buckets (used in case of fire only), kept always filled, should be distributed con-

spicuously over the premises. Each theatre should have at least two firemen (one on each side of the stage). Every play-house should be connected with the nearest fire-station by electric alarms in the office and on the stage, the latter to be further thoroughly equipped with automatic alarms. Theatres should be patrolled at day and night by watchmen, who should be controlled by electric watch-clocks, with stations distributed over various parts of the buildings, records to be kept on file for the examination of the inspector. No smoking should be allowed in the theatre, except where required on the stage in the representation of plays. Steam or hot water should be exclusively employed for heating. Scenery and other stage supplies should not be stored on the stage, but in a separate fireproof dock. No more scenery should be put upon the stage than is necessary for at most two performances. The use of fireworks, Roman candles, red fires, &c., should only be permitted when it has been shown to the theatre inspectors' satisfaction that the scenery and gauzes have been impregnated by proper substances, and that the woodwork has been covered by some satisfactory solution. Wads of pistols and guns should be of hair only—not paper or cotton. If straw, hay, or any other easily inflammable substance be required in a scene, it should be impregnated and be removed to a fire-proof place immediately after the scene in which it is used." So much interest was manifested in an exhibition of some *fire-proofed* (impregnated) substances and the results seemed to be so novel to many of those present that, perhaps, a few additional remarks may not be amiss. Ten years ago I wrote:—"The experiment of making certain pieces of decoration of an incombustible material has been tried many times, and with considerable success. Especially the flies, as being most exposed, and hanging among the border-lights, have in some cases been made of fine wire gauze. The interstices were then filled with an incombustible substance, and the flies were then painted in the usual manner. This method certainly gives entire security against fire, and the greater amount of first cost is more than counterbalanced by their greater durability; but the inconvenience of handling such pieces is greatly increased by their greater weight, making them practically impossible for drops, and larger wings and flats." Another device is to protect the wood and canvas by painting it with suitable materials, and thus to make it incombustible. After the rebuilding of the Opera House at Munich (destroyed by fire, 1823), the woodwork was given a few coats of water-glass. This kept well for twenty years, but later trial showed that the coating of water-glass had changed its chemical composition, and gave no further security. Water-glass is further objectionable on account of the gloss it imparts to scenery, thereby reflecting light, and spoiling the artistic effect of the painting. The impregnation of scenery before painting has been strongly advocated, and especially of the aforementioned flies. Some of the different substances used for this purpose are alum, sodium sulphate, borax, the soluble fluorides, and calcium sulphate. It was claimed that by impregnation canvas became so far incombustible that it could neither propagate flames nor glow for any length of time, and even under great heat would only char. After the fire at the Berlin Opera House the authorities ordered the soaking of all scenery in a solution of alum. The same question was raised and given to a commission to decide some twenty-five years ago in Paris. On account of the report of this commission an ordinance was issued enforcing the impregnation of all scenery. This was carried into effect in several theatres until, unexpectedly, some impregnated gauze was set on fire by the heat of a candle. The mayor had the case investigated. It was found that the ingredients used had lost their protective power, and had changed the chemical composition of the paint. The writer ascribes the failure of these experiments to the manner in which the process was conducted; the canvas being in all cases merely soaked in the solution, and then dried and painted. If a piece of canvas is soaked in water-glass and allowed to dry, the liquid in losing its water will contract more and more, until finally solid particles will sit loosely on the yarn of the canvas. Again, sodium tetra-silicate (water-glass being soluble in water), is dissolved on coming in contact with water. The

water-colours used in scene painting may therefore have dissolved the greater part of the silicate at the start. To obviate this the author would suggest the following:—After thoroughly soaking the canvas in water-glass it should be placed in a dilute solution of hydrochloric acid; this would precipitate the silica inside of the fibres of the yarn itself. The reaction being the formation of silica, sodium chloride and water—viz., $\text{Na}_2\text{Si}_2\text{O}_5 + \text{HCl} = 4\text{SiO}_2 + 2\text{NaCl} + \text{H}_2\text{O}$. The silica, being insoluble in water, could not be washed out, and, on account of its precipitation in the fibres, could not readily be thrown out, this process being a parallel case to the use of a mordant in dyeing; the linen in that case being first soaked in colour, and this then precipitated (made fast) by the mordant. As silica has no gloss, this process would also get over that difficulty. Of course, any other incombustible substance precipitated into the fibres will will answer as well as the above. Other solutions recently recommended for the purposes of impregnation are: Versmann's and Oppenheim's, who advise a solution of 2 parts of sodium tungstate with 3 parts of sodium phosphate; Nicoll, one consisting of 6 parts of alum, 2 parts borax, and 1 part dextrine dissolved in soap-water; Siebdrath uses 5 parts of alum, 5 of ammonium phosphate, and 100 parts water; Patera, 15 parts borax, 11½ parts of sodium sulphate, and 100 of water; Martin (see later invention further on), 8 parts ammonium sulphate, 2½ of sodium carbonate, 3 parts boracic acid, 2 of borax, 2 of starch, and 100 of water. And very recently it has been suggested to use a solution of magnesium chloride. The combustibility of scenery is also greatly lessened by painting it on both sides, as the fuzz on the back of scenery, along which flames spread, is thereby destroyed, &c. Scenery might be made much safer than it is by simply whitewashing the back of it, thus destroying the fuzz. This is an exceedingly cheap and simple operation, and there can be no excuse for not carrying it out," &c. And in the latter committee's report: "The only manner in which the dangers of fireworks may be lessened is by 'impregnating' all scenery and gauze by approved processes. Your committee has for the past six months experimented with all ascertainable processes of impregnation. A process which your committee has found to be deserving of entire public confidence is that of Dr. J. Fafen, of Frankfort, Germany. Satisfactory results have also been obtained by the processes of Gautsch and Judlin, by sulphate of ammonia, and by silica deposited in the fibres by precipitation. Besides impregnating the scenery, the woodwork should be covered with some fire-proof paint. Your committee experimented with a large number of solutions, and had most satisfactory results from real 'asbestos paint,' and especially from the so-called asbestos concrete." I will now add that the following processes are patented in the United States: 1. Zappfe, No. 199,950, Feb. 5, 1878; 2. Mathes, No. 254560, March 7, 1882; 3. Bartlett, No. 300,190, June 10, 1884; 4. Fröhlich, No. 310,404, January 6, 1885; 5. Smith, No. 314,886, March 31, 1885; 6. Konrad, No. 319,100, June 2, 1885; 7. Martin, No. 331,312, December 1, 1885; 8. Sornberger, No. 362,232, May 3, 1888; 9. McIntyre, No. 391,327, October 16, 1888; and McIntyre, No. 391,261, October 16, 1888. The compositions of which are roughly as follows: (Those specially interested can readily look up more thoroughly the specifications in the Institute library.) 1. Zappfe.—Hydrochloric acid (purified by chloride of barium), carbonate of lime, crystallised alum (with potash base), chlorate of ammonia, borax and water. 2. Mathes.—Two parts soda, 1 part alum, ½ part borax, ½ part potash, 6 parts water-glass, and water. 3. Bartlett.—200 gallons water, 400lb. sodic chloride, 200lb. ammonium chloride, and a solution of 156lb. carbonate of potash and hydrochloric acid, neutralised by 75lb. of bicarbonate of soda. 4. Fröhlich.—Compound of silicate of soda, alum, sodium chloride, and phosphate of ammonia. 5. Smith.—Sulphite or hyposulphite of soda with muriate of ammonia; common rock-salt is added for incrustation. 6. Konrad.—Solution of sulphate of ammonia, carbonate of ammonia, borax, bichloride of mercury, peppermint, carbolic acid, bitungstate of soda, and chloride of lime, transformed into an emulsion by leading into the solution the products obtained from the distillation of a solution of Peruvian balsam and camphor in acetic ether. 7. Martin.—(Specimens of inflammable substances treated by this

process were shown and tested at the meeting.) Glycerine, ammoniacal salts, and fire-resisting and preservative substances. Specified as 2 parts by weight of glycerine, 1 carbonate of ammonia, 8 hydrochlorate of ammonia, 8 soluble cream tartar, 8 oxalate of potash, 8 boracic acid and water. 8. Sornberger.—1 gallon water, 1½lb. chloride of sodium, 1½lb. chloride of ammonium, 10 to 30 grains potassium permanganate, 4oz. sodic sulphate. 9. McIntyre.—Ammoniacal and preservative salts and sulpho-ricinoleate of ammonia. I have had occasion to test the latter with good results. It is claimed that the sulpho-ricinoleate prevents the dropping out of the salts: which in case of the Martin process is accomplished by means of glycerine. The trouble with most solutions has been that when the salts have, in the course of time, become thoroughly dried they drop out of the fibres; this can be prevented by using a hygroscopic substance in the compound, as glycerine in the Martin process, which, although in minute quantities, continues to absorb moisture from the atmosphere, thus preventing the absolute drying and disintegration of the salts. I can see no reason why other hygroscopic substances, such as calcium chloride, zinc chloride, &c., will not serve the same purposes as glycerine in such compounds. Laws making the treatment of scenery in new theatres compulsory (as in New York) have not been successful. Although the "stock" scenery of a new theatre must be impregnated before the play-house is allowed to be opened, the travelling companies, with each piece, bring in materials which have not been treated, and which may cause a fire. The only remedy would be stringent laws and heavy fines against the use of any untreated materials. A large smoke-flue should be provided above the stage. Automatic devices are recommended. These, and the reason for their introduction, I described in a former paper. That the public itself may have control in this matter, a complaint book should be laid open to the public in every theatre, where any individual may enter faults of construction or arrangement which he has noticed. This book should not be the property of the proprietor of the theatre, but should belong to the Theatre Inspector, the Fire Marshal, and Building Inspectors. The workshops and paint loft should be outside of the stage building. Ground plans of the auditorium, giving a clear idea of the building, corridors, stairways, &c., should be prominently located in the halls, and should be printed on the back of programmes. We all know by experience that any matter which devolves on a number of persons, especially when their time is fully occupied by other duties, is done badly, or not at all. As the old adage as it, "Everybody's business is nobody's business"; therefore, in order to keep control of the various theatres, a theatre inspector should be appointed, who should have full power to enter a theatre at any moment, and whose duty it should be to see that these or other suggestions, made law by ordinance of councils or an act of legislature, are faithfully carried out, to inspect watchmen's records, &c., test fire appliances, and once a month make a report on each theatre. These reports should be kept on file by the Director of Public Safety, and can be used as evidence against managers, or against the inspector, should he become derelict in his duties. I quote an Underwriters' Association report, in order to give a general idea how such reports should be made (I purposely do not give the name of the theatre, which, since this inspection, has been somewhat improved):

Date.....
Report No.....
Location.....

Building and Fixtures.—Walls, brick; roof, tin and slate, mansard in rear; cornice, wood (boxed); walls coped 5ft. lower than building adjoining on east; 12in. between front communicating building and theatre on south; skylights, thick glass, no screws; columns, iron in galleries; galleries, two; ceilings, plastered; communication to front building, occupied by merchant tailor, gas-burner company, and offices and lobby of theatre; fire-shutters and doors, none; heating, by furnaces, well arranged; lighting, city gas, each section separated, and controlled at gas-table on stage; gas lighted by electric spark; border, foot-lights, &c., caged; proscenium, arch, frame; electric arc lighting in lobby and in front on street.

Fire Protection.—The fire protection consists of a

3in. stand-pipe supplied by city main, with only one outlet which is in property-room at rear of stage, 75ft. of good linen rubber-lined 2½in. hose attached to stand-pipe by globe valve and Jones coupling; one cask for water each side on stage and one in flies on the prompt side; six metal fire-buckets each side on stage and two each side in flies; running water on O. P. side of bridge; no buckets in auditorium; watchman nights and Sundays, no clocks; city water 27½lb. pressure at 3 p.m.; smoking allowed only as the business of the play demands. **General Information.**—No boiler; ashes loose; waste-paper, sweepings, and rubbish allowed to accumulate under stage; carpenter work done on stage; glue heated by gas on bridge safe; water-colours only used for scene-painting; scenery stored on stage; property and dressing-rooms in rear of stage, separated by frame partition; water-casks and fire-buckets very much neglected; in one instance water-casks had fallen apart for want of proper care. The theatre building is in direct communication and one and the same risk with building where the merchant tailor tenant is using a gasoline pressure stove for generating steam in sponging cloth, carrying from one to five gallons of gasoline on second floor; the theatre building proper was originally an old stable. Building in fair repair; order and cleanliness poor; management fair. **Improvements.**—We suggest that all gasoline and gasoline stoves be removed from building at once; fire-buckets and water-casks to be regularly attended to and kept full of water; one dozen additional fire-buckets be distributed in galleries on hooks; all waste paper and sweepings be removed from building, and under stage not to be used for a general receptacle for waste paper, sweepings, and rubbish. And now, in conclusion, permit me to touch another point, which, however, I do with some diffidence. Being a resident of the fifteenth ward, I am fully imbued with the positive general necessity of the proposed 6,000,000dols. boulevard to the park. We are all in accord with the movement to create additional breathing spots in our city, and to expend a large sum of money to beautify the surroundings of the bourse. But where, permit me to ask, are we more in need of open spaces than around our places of amusement where thousands nightly congregate? The only way which theatres can be made safe is to place them fronting broad streets not less than 60ft. wide, with wide open spaces on both sides not less than 20ft.—30ft. would be better in width. Then fire-escapes, which are what the name implies, can be erected, and not arrangements the descent of which test the skill of an acrobat in broad daylight. The best system of fire-escapes is that of separated brick towers as introduced for permanent stairways in some of our well-constructed manufactories. I believe we have a right to require of our legislators that they prohibit the erection of additional fire-traps. But what shall we do with our present theatres? Force the Legislature to make them safe by Acts regulating their surroundings.

AN ARCHITECTURAL TOUR IN 1634.

IN this pleasant time of year, "When longen folk to gon on pilgrimages, And palmeres for to seken strange strondes, To serve halwes cowthe in sundry londes," it may not be out of place to describe such a pilgrimage of more than 250 years ago. According to the manuscript, which is in the Lansdowne collection at the British Museum, three gentlemen of Norwich determined to visit some of the principal towns in their native country. In that age—before railways, before coaches, before stage-waggons, and in places, one might say, almost before roads—this was a sufficiently enterprising resolve. The travellers were a captain, a lieutenant, and an ancient (or ensign) of the military company in Norwich. They set out on Monday, August 11, 1634, made a "survey" of 26 counties, and were absent from home about seven weeks. Their object was not entirely architectural; but architecture was a thing which they much appreciated, and the most interesting parts of their journal are those which relate to the buildings they saw. The first night, "with soldiers' journeying ammunition"—whatever that may imply—they "marched to the maritime Towne of Lyn." Next morning they consulted, and thought it hardly safe to pass the "Washes," which were

neither firm nor fit for travellers, by reason of the new-made sluices and devices for turning the natural course of the waters. The Wash, apparently, had begun to be reclaimed from the sea—and so, instead of crossing it, they turned south-west to Wisbech. Here they spent an hour, viewing the army of artificers who were at work on drainage and navigation schemes. "Longer," they say, "though willingly we would, we durst not stay, for that Sol's fleet coursers would have outrun our jades." They posted, therefore, over Tid-Sluice—on the border of Norfolk and Lincolnshire—arrived at Spalding, and spent the night at the Castle. The river was not deep enough to drown a mouse; but the fen drainers had undertaken to make it navigable, and 6ft. deep, from Fossdyke Slough to Deeping. Five hundred men were then at work on this undertaking—a very important one at a period when the rivers, in the East of England, formed the readiest channels for the carriage of heavy goods.

Our tourists' next stopping-place was Sleaford. There they spent an hour in viewing "the fayre church and monuments." Of these last the chief were Sir Robert Carr's and Mr. Walpole's. Then they came in view of Lincoln. Like many more people, when first they espied the high towers of the cathedral, they thought it near; but it proved, to their sorrow, to be distant "a full jury of miles." Arrived there, they at once visited the Norman castle, then used as a gaol. The gaoler mistook them—apparently because of their green uniform—for "Clerks of the Green Cloth," and after being at first extremely civil to them, became in the end extremely suspicious. They gave him a fee, however, and sent him back to his gaol—"indeed," as they said, "the fittest place for him." Then they "addressed themselves to hear the cathedral prayers, and see the ancient monuments and varieties of that stately and magnificent minster." Amongst other tombs, they saw that of "Queen Elinor, wife to Ed. I., with her bowells in copper"; that of Bishop Sutton, in the same reign, who died in his pulpit, preaching; and that of Bishop Alexander, who built Newark, Bambury, and Sleaford Castles. Then they went on to Newark, and saw "that strong, spacious, and stately castle, wherein his Majesty with his Royal Consort did lodge"—now, in our days, a heap of ruins. But Newark steeple has lasted on, and still "standeth by his beautiful spouse, the church, like a proper bridegroom by his neatly-trimmed bride."

At Doncaster they put up at the "Three Cranes," and went on to Pomfret, passing, on the road, by Robin Hood's well. Here they were sworn and knighted, according to the custom of travellers, the fees amounting to fourpence each. At Pomfret they surveyed the "high and stately, famous and princely, impregnable castle and citadel, which for situation, strength, and largeness, may compare with any in this kingdom." The castle had seven towers, of which the Round Tower was the highest: and in this, tradition asserts that Richard II. was murdered. York was their next destination, and they reached it late on Saturday night, having done a very creditable week's work, considering the nature of the roads and the amount of looking about that had accompanied the travelling. York, they tell us, was built in the reign of King David, a more than doubtful story, whether they refer to the Welsh or the Hebrew monarch of that name. They victualled at the house of a loving and gentle widow, who welcomed them with a glass of good sack and a dish of hot fresh salmon, and took such care of them that she seemed a mother rather than a hostess.

On Sunday morning they prepared and fitted themselves to attend the Cathedral service. The archbishop's chaplain preached, and the pulpit stood "in the midst between the quire, the high altare, the archbishop's seat, and the organ." There was "a Paul's Cross auditory," including the Lord Mayor, the twelve aldermen, the sheriffs, the recorder, the vice-president with his grave and learned counsel, and "many knights and gallant ladies that reside in the old city." Altogether, our travellers looked upon it as a second London. After he morning and afternoon services, they spent most of their time in the Minster. There they found a rich and rare library. They saw the place where St. William's shrine formerly was, and his tomb, 7ft. long, some time covered all over with silver. On the breaking up of the monument, King James commanded his

bones, which are large and long, to be kept as they are, in the vestry." Here were also kept the sumptuous vestments of the church—"the gorgeous canopy, the rich Communion table-cloths, the copes of embroidered velvet, cloth of gold, silver, and tissue, of great worth and value." There was also a dainty, sweet, clear well, called after St. Peter. The chapter house seems to have excited even more admiration than the minster. At the entrance, over the doors, was "framed our Saviour's picture, in his mother's arms, and St. Peter and St. Paul on either side." The "strange, miraculous roof, which is most beautiful and rare to all that behold it," still commands admiration, and the building still merits the inscription, which, in our travellers' time, had not long since been put up: "Ut Rosa Flos Florum, sic est Domus iste Domo-rum."

Their first task on Monday morning was to ascend the central tower by a staircase containing 270 steps, but that these loyal subjects accounted no labour at all, his Majesty having but lately done the same thing. After taking a view of the city, which then contained 28 churches, they went over the house and grounds of Sir Arthur Ingram. The gardens were "adorned with many kinds of beasts to the life"—whether executed in topiary work or in something more permanent does not appear. There was a fine tennis-court, a delightful bowling-ground, and curiously-contrived fish-ponds. The house itself seems to have been less remarkable than the furniture and the plate. It almost adjoined the Minster. The next place visited was the manor, formerly St. Mary's Abbey, but then used for the Lord President's lodgings. On Tuesday morning our tourists thought it time to depart from York, though they "would willingly have stayed longer to hear a famous scholar tried for blasphemy in the High Commission Court." Denying themselves this pleasure, however, they spurred on for "Topcliffe, near Spur Rippon," found good entertainment though the town was small, and went on next day to Durham. Their account of it is still accurate, though within the last half-century the marvellously picturesque spot has been surrounded by a legion of mean streets and petty dwellings, like an army encamped to besiege it. Still, however, the cathedral is "placed on the top of the city, all on a rock, like a hill in a dale." Still the castle and the heart of the town are close beside it, and still they are "environed and nigh girt round by the river Wear." In the cathedral they found, amongst many other things of note, "a font not to be paralleled in our land, with a wooden cover opening like a four-quartered globe, 'carved with such variety of joiner's work as makes all beholders to admire.' There was a remarkable clock, showing the moon's age, the day of the month, &c., and 'a fair communion table, which cost £200, of black branched marble, supported by six fair columns of touchstone.' This had been erected at the cost of the dean, Dr. Hunt, who was then living, and seems to have been an unusually late example of a stone altar in an English church. It would take up too much space to enumerate all the other marvels of Durham Cathedral, its monuments, its manuscripts, and its vestments. The singular bronze knocker which still exists there, and which is said to have been meant for the use of persons seeking sanctuary, is not referred to.

From Durham to Newcastle was the next stage. This town was then surrounded by a strong and fairly-built wall, with many towers thereon. It was governed by a mayor and twelve aldermen; and "the last mayor and now recorder did both endure knighthood" during his Majesty's late progress. The town-hall, the castle, the "neat cross," and the four churches were all visited; but no remark is made on the striking tower of St. Nicholas. At Hexham, on the way to Carlisle, it is noted that the large cathedral-like church is much defaced and decayed, and unseemly kept. Carlisle Cathedral was little better. It is described as looking like a great wild country church—not beautified nor adorned one whit. It contained the monument of Snowden, the bishop "that preached Robin Hood to our late renowned king." Does any other record exist of such a sermon—or does anyone now know what was the meaning of "preaching Robin Hood"? Disappointed in Carlisle, the travellers were delighted at an invitation from Lord William Howard to Naworth Castle. They were most hospitably and courteously entertained, and questioned about

various matters relating to Norfolk. Lord Howard informed them that though the united ages of his wife and himself amounted to 140 years, they only made up 25 years between them when they were married. Amongst other dishes served at table, a live roe was brought in—probably as a kind of centre ornament.

At Penrith, at Kendal, and at Lancaster, few architectural notes were made. In Lancashire the tourists were appalled by "those deep hell coal-pits," which their horses were the first to discover, and by their snuffing helped them to escape from "this black and dismal danger." Avoiding these perils, they journeyed through Wigan, Preston, and Warrington, to Chester; at which place for the present we may leave them.

THE COLUMBIAN EXPOSITION BUILDINGS.

THE Government Buildings in the World's Columbian Exposition of 1893 will be a remarkable example of iron construction. The central dome is 120ft. in diameter, is surrounded by a series of galleries, and will be covered alternately by curved and straight-pitched roofs. These roofs are 50ft. span from centre to centre of columns, which are of Phoenix section. The main rafters are of two angle-irons, 6 by 4in., weighing 72lb. per yard. The struts are T-shaped, ends of which are riveted to suitable connecting plates with steel pins 2½in. diameter. The truss is tied to the columns by T irons 7ft. below the springing. The straight-pitched truss may be described as being composed of an inverted king and queen post to each principal rafter, the two trussed rafters being tied together by square 1½in. tie-bars. The curved roof is of similar construction, but has a central skylight surmounting it. The tie connecting the end of each truss to the column which cuts off the angle of each roof is an important feature, in securely connecting the truss with the columns, and in giving transverse rigidity to the structure. These angle ties or brackets improve greatly the appearance, and give a sense of stability to the light construction. The columns are of the Phoenix type, rolled in four segments and riveted together, and are 45ft. in height. As an example of economical iron construction that is capable of speedy erection, these buildings will probably be unsurpassed from an engineering point of view. The variety in the plan and type of construction of these several buildings is instructive to the student. In every case the sections of members and connections are of the simplest kind, generally angle-irons, single or duplicated, for struts and rafters, square bars for the tensile members, and lattice arrangements for the principal girders. The possible variety of arrangements which may be adopted will be seen, no doubt, in this forthcoming exhibition of the world's material progress.

CHIPS.

The name of William Woollett, of Brixton-road, S.W., surveyor and architect, appears in Tuesday's *Gazette* among the adjudications in bankruptcy.

It is stated at Maidstone that West Malling Abbey has been purchased by a lady, who intends to "restore" the fabric and dedicate it to the use of a community of "Enclosed Sisters of the Benedictine Order."

A Boston journal announces, but the statement must we fear be classed among the tall stories, that "we have decided to erect a school-house large enough to accommodate 500 scholars three stories high."

At the last meeting of the Halifax town council on the 6th inst., a report of the Technical Instruction Committee was presented, in which the approval of tenders for the erection of a new technical school was recommended, the total cost being £12,409. This led to a lengthy discussion, and it was decided that the matter should be deferred until after the November elections.

Mr. Justice Romer has pronounced his judgment in the Hickling Broad case. He decided that the plaintiff, Mr. Micklethwaite, who desired to prevent anyone from fishing or shooting in the Broad, has established his ownership of the water, as the successor to persons to whom it was awarded by the Inclosure Commissioners in 1808. The learned judge held that the Broad is not tidal. The plaintiff was entitled to his costs in supporting his contention on these points, but Mr. Justice Romer declined to restrain the defendant from boating on any part of the Broad.

CONTENTS.

Professional Exclusiveness	61
London Building Law	61
The "Ordinary Flow" of a River	62
Theatres	63
Prices.—XL	64
The Construction and Interior Arrangement of Theatres	65
An Architectural Tour in 1834	67
The Columbian Exposition Buildings	68
Our Illustrations	69
University College Architecture Results	69
Competitions	69
Schools of Art	69
The Building News Directory	XIII
Wayside Notes	88
Architectural and Archaeological Societies	88
Our Streets and Footways	89
The Architecture of the Fifteenth Century	89
Decoration	89
Books Received	90
Building Intelligence	91
Engineering Notes	92
Correspondence	92
Intercommunication	92
Legal	93
Legal Intelligence	93
Water Supply and Sanitary Matters	94
Our Office Table	95
Trade News	95
Tenders	96

ILLUSTRATIONS.

FURTHER ILLUSTRATIONS OF THE DESIGNS FOR THE NEW MUNICIPAL BUILDINGS, OXFORD.—HOTEL DE VILLE, OUDENARDE.—USEFUL MODERN FURNITURE FROM THE HOME ARTS EXHIBITION.

Our Illustrations.

NEW MUNICIPAL BUILDINGS, OXFORD.

LAST week we illustrated the selected design for this work, besides three out of the four other designs in the final competition. We now give further illustrations of these designs in detail, and also illustrate the remaining scheme, which was submitted by Mr. Ernest Runtz. This design was reckoned second in merit by the referee, Mr. T. E. Collcutt, who, however, said in his report that "in neither of the designs would" the council "have a building equal in architectural merit to those erected in Oxford in recent years." Mr. Runtz claimed economy, simplicity and directness of plan, concentration and intercommunication of all departments, avoidance of internal open areas, retention of vaults under present Corn Exchange, complete natural lighting throughout, special attention to ventilation and warming, ample entrances and exits (six in all) to the town-hall and concert-room, provision for future extension. The following abstract from his report gives a description of the departments. The town-hall and concert-room are situated upon the first floor in the rear of the library, are bounded on the north by the grand staircase hall and foyer, and on the south by Blue Boar-street, access being given by the former to the principal portion, other approaches and exits from the latter. The police and administration of justice departments are retained in the rear of the site, the official portion of the former being on the ground floor, the latter on the first floor; they are distinct from the other departments, although (in common with all other portions of the building) arranged for intercommunication if desired. The entrances are from Blue Boar-street, inasmuch as police-courts and offices are objectionable in any main thoroughfare, such as St. Aldate's-street. The municipal offices occupy the northern portion of the façade; they adjoin and communicate with the town clerk's offices, and form one block. The approach is by a flight of steps facing the tower. The public library is at the south-west corner of the site, approached directly from St. Aldate's-street. The whole of the offices available for daily public business are on the ground floor, with other various approaches opening directly into the entrance hall on the north and east sides of the same. The planning is based upon the principles generally approved and adopted in municipal offices—viz., clerks' offices are used as thoroughfares into private rooms. Accommodation is provided for 26,000 volumes in the lending library and bookstore. The newsroom accommodates 40 readers, and the magazine room 56 readers. The reference reading-room has accommodation for 7,000 volumes. The ventilation for the town hall is arranged in two systems—one for use in winter,

and the other in summer. 2,000 cubic feet per head per hour of fresh, filtered, and warmed air was arranged for an audience of 1,400, propelled by a 7ft. fan specially designed. For summer ventilation the fresh air would be propelled at the lower portion of the hall, and would pass away by the openings of the sliding-roof. The materials proposed to be used were Monk's Park stone, and Box Ground Bath for external work. The town hall to be largely decorated in fibrous plaster and low relief; the council chamber in wainscot oak. Of the architectural treatment, the author says: "I venture to think that the designs exhibit a distinctly original treatment of Gothic Renaissance, both characteristic and unique, with an idea carried throughout the plan. I do not pretend to have discovered anything new, but only to have developed a style unlike anything in Oxford, but yet harmonising with the surrounding buildings. The main block of buildings has been set back, which materially assists the appearance. The skyline is varied and picturesque." No doubt of the grouping of this design, in the words of the referee, it may be said "the general idea of the architectural treatment, is decidedly superior to" Mr. Hare's design. Mr. Collcutt thinks, however, that the detail is not equal in merit to Mr. Hare's, "and certainly does not bear out the impression made by the elevation in the first competition." Our own opinion of the merits of these five designs, which we have now placed before our readers by these illustrations, was clearly set forth in our review published on June 24 last.

USEFUL MODERN FURNITURE, HOME ARTS EXHIBITION.

THE Coffin which comes first on this illustrated sheet is made in unpolished walnut, and was one of the most successful pieces in the exhibition. It is an adaptation from an old Italian example, but although receiving its inspiration from that source, the general design has had new life imparted to it by the character of the mouldings and quaintly spread legs—all in good taste and free from apparent effort. Indeed, the plainness of every part, except the one carved panel in front (which we take to be really the only old part of the design), is one of its chief merits. It is capably put together, moreover, the design of construction being worked out by Mr. C. Voysey, architect. It comes from the Stepney class, and Messrs. Herbert Shaw and Jas. Lewis are responsible for carrying out the work. The Looking-Glass from Bolton-on-Swale is adapted from an old panel by Miss Beatrice Carpenter. It is pleasing in its novelty, though not of equal merit throughout, and the construction struck us as being capable of improvement. The woodwork is oak stained green. The Hall-Chest is executed in unpolished oak and forms a most useful piece of furniture. The upper part is arranged as a chest, while beneath are two drawers, a cupboard, and a handy recess. The design of the turned legs is the weakest part, as it hardly accords with the archaic character of the carving. Messrs. Thomas Dobson, Robert Brown, George Taylor, Frederick Atkinson, and Charles Lennick, of the Gainford class, were associated together in its production. The Drawing Whatnot from Penshurst is a capital solution of the difficulty of what to do with our portfolios, which will appeal to all architects. The design, too, is good and appropriate. The character imparted to the two front posts, while keeping all the carved work without projection, is decidedly clever. Beneath the shelves (which are adjustable to required heights) is a drawer; and again, beneath this, two side cupboards, and one in the centre recess, which latter would be well-nigh useless. It is executed in walnut from the design of A. and J. Escombe; the square panels are evidently adapted from the panelling of an old house at Exeter, now at the South Kensington Museum. Messrs. G. Totman, T. Izzard, and Albert Izzard did the carving and construction. We gave a full report of the exhibition in our issue of June 17.

DETAILS OF HOTEL DE VILLE, OUDENARDE.

We printed in our issue of March 18 last details of the dormers at the above building. We now give a reproduction of the ground-floor arcade from the working drawings of Prof. Hillespulle, the architect of the restoration. We are indebted to M. Vincent Lenertz for his courtesy in lending us the drawings, and we hope shortly to publish details of the clock tower in the centre of the façade.

UNIVERSITY COLLEGE ARCHITECTURE RESULTS.

A.—FINE ART.—1st Class Certificates: W. J. Keith, Donaldson Medal; Miss G. M. Mulley, Book Prize. 2nd Class Certificates: Clyde Young, W. C. Brown. B.—CONSTRUCTION.—1st Class Certificates: W. G. Hazell, Donaldson Medal; A. F. Wickstead, Book Prize; H. G. Church, C. L. T. Griffith. 2nd Class Certificates: A. R. Hennel, G. H. Coles, Clyde Young. PROFESSORS' PRIZE FOR SKETCHES.—W. C. Brown. CARPENTERS' COMPANY'S PRIZES.—Architectural Drawing: Theobald. Constructional Drawing: H. J. C. Kühl, A. Hayward. N.B.—Prizes and certificates lie at the office of the College.

COMPETITIONS.

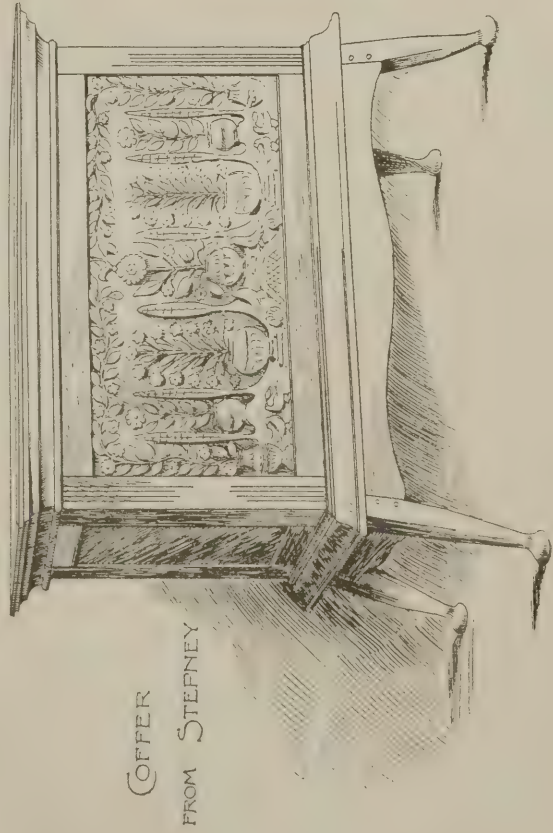
YORK.—The committee appointed to select a sculptor to execute the bust of the late Duke of Clarence and Avondale, to be placed in the entrance hall of the new Courts of Justice, in Clifford-street, York, assembled on Wednesday week in the Mansion House, in that city, for the purpose of inspecting the busts which had been forwarded by the following competitors:—A. N. Hossay, York; W. D. Keyworth, London and Hull; G. W. Milburn, York; D. W. Stevenson, Edinburgh; J. Verheyden, London; Walter Merrott, London; George E. Wade, London; W. J. S. Webber, Harrogate; F. J. Williamson, Esher; Joseph Whitehead, London. The committee unanimously gave preference to the two models executed respectively by Mr. W. D. Keyworth, of London and Hull, and Mr. F. J. Williamson, of Esher. On these a vote was taken, and it was in favour of Mr. Williamson, who has already produced a fac-simile for the Queen. The bust and pedestal are to be executed within three months from the present time.

SCHOOLS OF ART.

NATIONAL ART TRAINING SCHOOL.—Sir James Linton, P.R.I., distributed the prizes to the students of the National Art Training School at South Kensington on Tuesday. Mr. John Sparkes, the principal, in his report, stated that the students gained in the national and local competitions of 1891 1 gold medal, 3 silver medals, 5 bronze medals, 9 national competition books, 119 third-grade prizes, and 30 prizes of a lower value. The students in training, national scholars, and free students who took honorary awards obtained 4 gold medals, 16 silver medals, 23 bronze medals, and 62 national competition book prizes. In the local competition, open to students of these schools only, 10 silver medals, 21 national competition books, and 4 third-grade prizes were awarded. At the third-grade, or highest art examinations, 35 art certificates were obtained by students in the National Art Training School. Twenty students obtained prizes for passing "excellent." At the second-grade examinations in May, 26 students obtained 30 prizes, 32 passes were obtained, and 8 obtained the second-grade certificate. The holders of the travelling scholarships were Mr. John H. Parkyn with the gold medal, Mr. H. C. Innes Fripp with the silver medal, and Mr. Peter McCrossan with the bronze medal. Sir James Linton then distributed the prizes, after which he addressed the students, in the course of which he contended that since its establishment in 1849 South Kensington had fully borne its part in the development of the fine arts. As on a former occasion when he distributed the prizes, he warned the students not to neglect the characteristic features of English art for those of other countries.

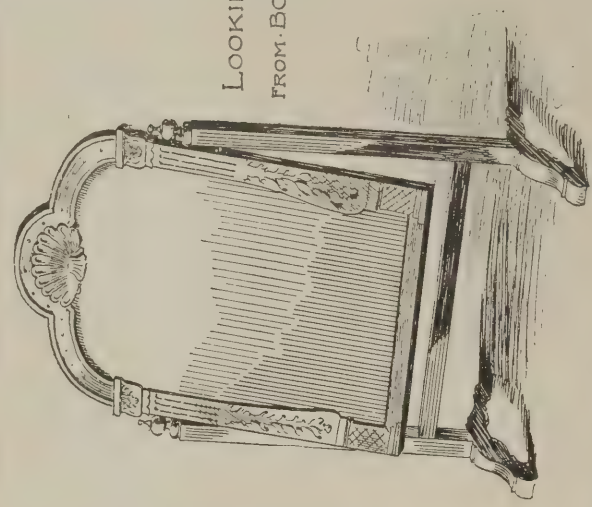
The new Free Church at Moffat, N.B., was opened on Wednesday week. The church, which has been erected from plans prepared by Mr. D. B. Burnie, architect, Edinburgh, is in the Early English style. The church is seated for 700, the total cost being £4,200.

A few weeks ago the Mersey Docks and Harbour Board voted £180,000 for the improvement of the Canada, Huskisson, and adjoining docks, in order to afford accommodation for the great Atlantic liners, and at the last meeting of the Board the committee of works brought forward a supplementary recommendation to spend £27,000 more at these docks. They asked for £19,000 to construct a passage 90ft. wide between the proposed new half-tide dock and the Huskisson Dock, so as to provide 600ft. of working quays. The committee also asked for £8,000 to erect a shed at the south-east end of the Huskisson Dock. The recommendations were unanimously agreed to.

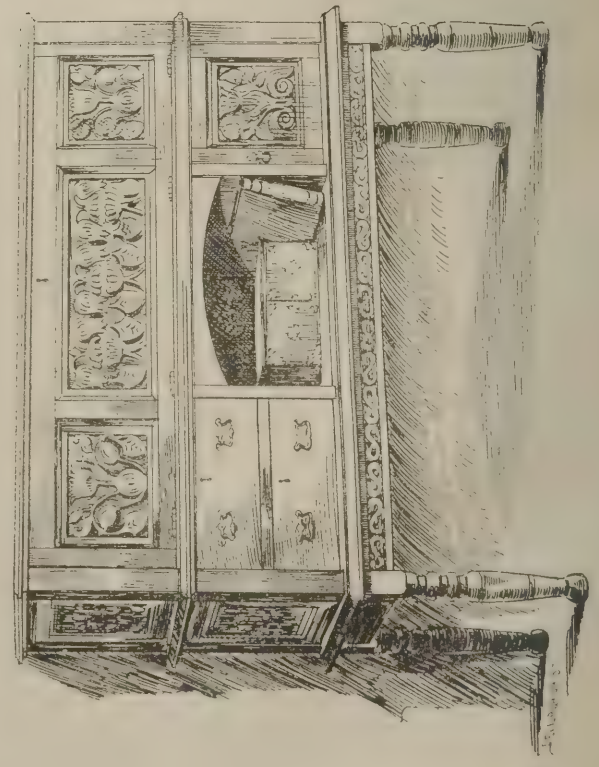


COFFER
FROM STEPNEY

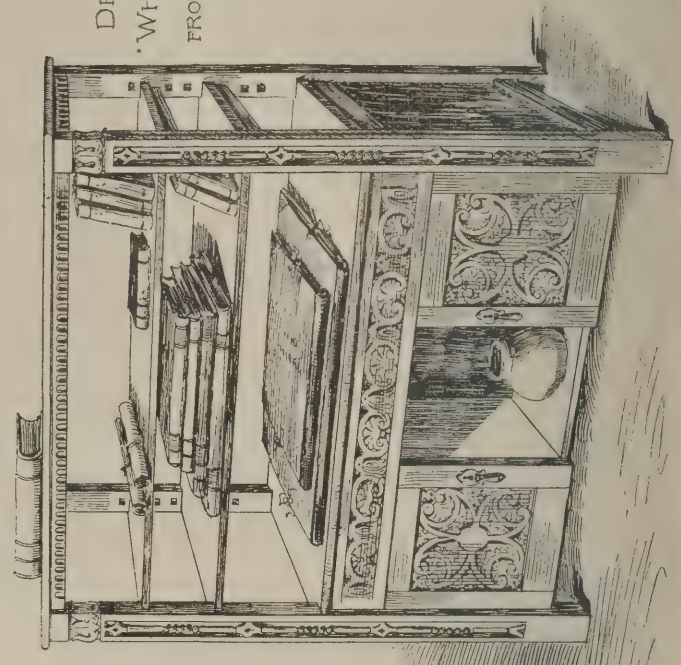
USEFUL MODERN
FURNITURE
AT THE
HOME ARTS EXHIBITION
ROYAL ALBERT HALL.



LOOKING-GLASS
FROM BOLTON-ON-SWALE.



HALL CHEST
FROM GAINFORD

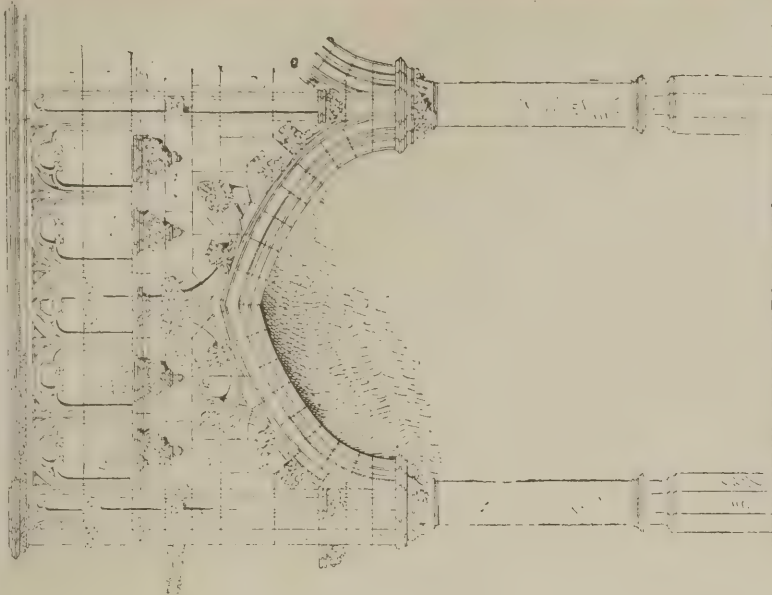
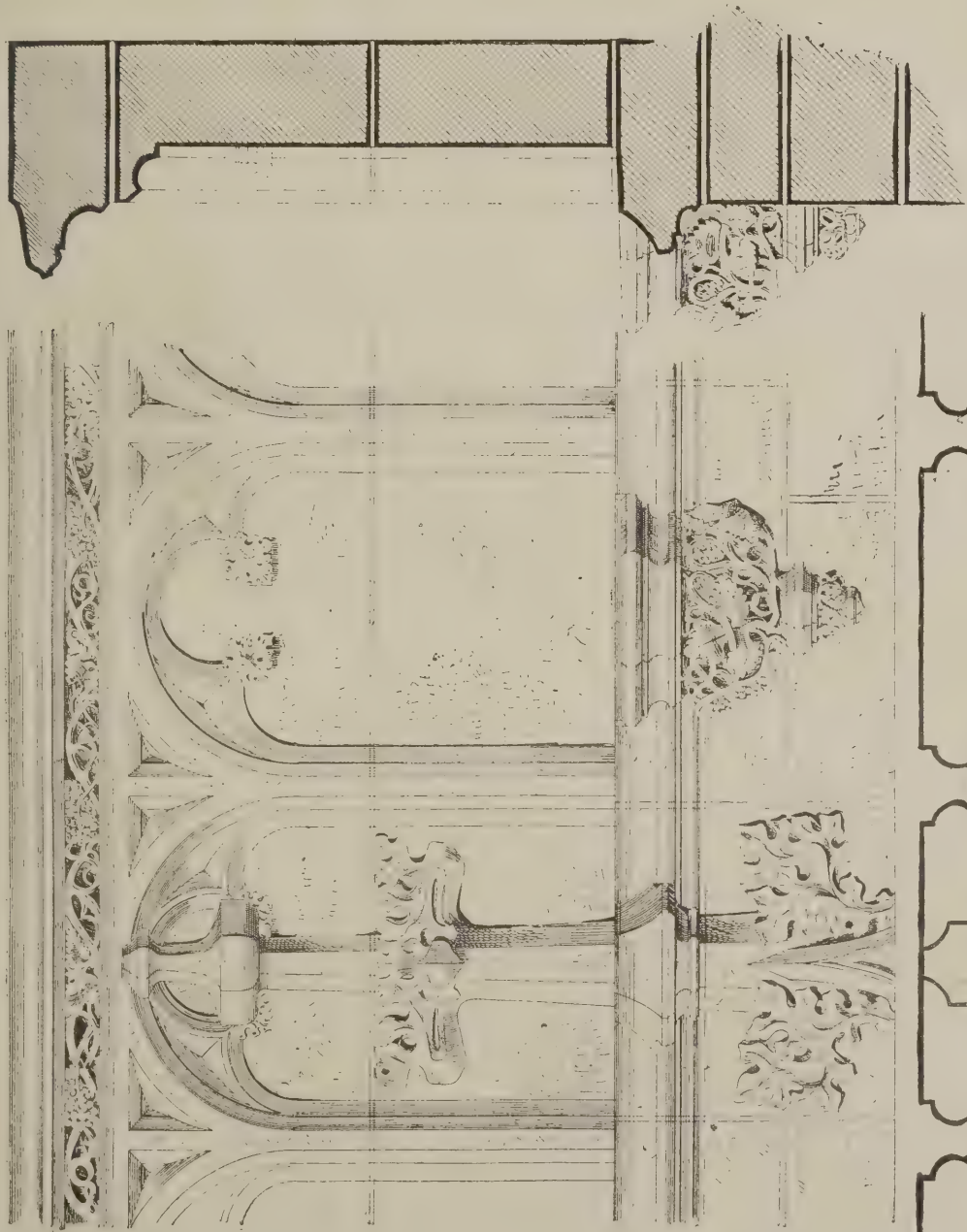


DRAWING
WHAT-NOT
FROM PENSURST.

Chancellor & Co.

LOUDENARDE HOTEL DE VILLE

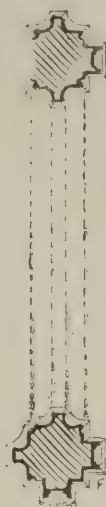
DETAILS OF GROUND FLOOR ARCADE



ELEVATION

WALL LINE

PLAN



PROFESSOR HILLESVILLE
ARCHITECT FOR THE
RESTORATION

1892

VINCENT LENEZT

CHEF DE TRAVAUX GRAPHIQUES

WAYSIDE NOTES.

THERE is wonderfully little doing in the architectural way, so far as concerns matters topical, politics being still in the ascendant, and holiday-making coming quickly into prominence. Perhaps if one thing has created more interest than another during the past few weeks it is the Oxford competition, Mr. Hare's success having brought to a finish an interesting struggle. The architectural elections have been swamped by the Parliamentary elections, and the result of the Association party-struggle has not made an epoch. If the professional world appears as dull and featureless to readers as to myself, I might just as well be still in Scotland, discovering hills beyond Pentland and lands beyond Forth, as commenting upon any matter in these pages.

I was glad to see the letter of Mr. M. R. Ellerton in your last issue. One of the things that have been constantly advocated herein is the appointment of assessors of special knowledge of special cases. What more disheartening to the competitor—specially acquainted with his subject—than to learn that a gentleman of absolutely no experience in that particular line of design has been appointed assessor to the competition? It is scarcely necessary to appoint two or three assessors. One good one is worth several of less skill, and too many cooks may spoil the "broth," even in the way of architectural competitions. For exceptionally-large buildings your correspondent's suggestion may be good; but in the ordinary way what is wanted is one really competent man. By a competent person I mean an architect of known experience in library planning, school designing, or whatever the subject may be, and not someone who "crams" for the work, and hastily gets up information on the spur of the moment.

From the size and character of the advertisement from the Corporation of Bournemouth, one might imagine that it announced a competition of great magnitude, and not merely a garden pavilion. It is, however, pleasing to peruse an advertisement for competition plans so thorough and complete. Youthful and not over-rich competitors will complain of the three-guinea entrance-fee, which does seem unnecessary. On the other hand, payment is offered to the six architects to be selected for the final competition, although I cannot make out whether there is to be fifty pounds between six architects or £50 each. It makes all the difference. The otherwise complete account is here decidedly vague.

I am glad that the County Council is at last likely to do something practical in the way of London street improvements. The Improvements Committee have prepared a report upon the proposal to construct a new street from the southern approach to the Tower Bridge towards the south of London. It appears that the City Corporation have arranged for the construction of an approach road from the bridge to Tooley-street, but from Tooley-street towards the south it is only possible to advance through narrow and winding thoroughfares. The Improvement Committee of the L.C.C. consequently recommend the construction of a new street from this approach road in Tooley-street to near Bricklayers' Arms at the junction of the Old and New Kent roads. A street 60ft. in width is proposed, and the committee recommend another attempt to obtain Parliamentary sanction to the adoption of the betterment principle. The total cost of the whole improvement is estimated at about £423,000, and it is said that were the street made 80ft. wide it would cost one-third more—a statement that seems to set rule-of-three at defiance. The improvement seems a sensible one. It is evidently of little use to construct a bridge with insufficient approaches. The Tower Bridge is now getting on, and in some ways approaching completion. I had a good view of it the other day when leaving St. Katherine's Dock, and again when drawing up to a quay, quite close to the bridge, on my return from Edinburgh. The process of encasing the metal work in masonry goes on apace, and soon the iron skeletons will be transformed into elaborate Gothic towers, more or less pleasing to the eye, according to the taste of the beholder. It is expected that the bridge will be opened for traffic some time next year.

Mr. John Hutton, the County Council's new chairman, is said to have shown great industry in Committee; Lord Carington, in proposing the new chairman, especially mentioning the Building Act Committee. There is always plenty of room for industry and energy in dealing with the Building Act, and if, in his new position of Chairman to the Council, Mr. Hutton can still further revise and improve this piece of legislation, it will be a great thing. By the bye, in connection with the Report on the proposed new street between Tooley-street and Bricklayers' Arms, Major Probyn has given notice to move that the Report be referred back to the Improvements Committee with a view to ascertain if it be possible to acquire land on either side of the new road, and thus insure the architectural character of the new buildings. The Report is to be discussed at next Tuesday's meeting.

The annual cholera scare is now well on. This year there seems some slight ground for taking precautionary measures, though there is no knowing, it being so easy to make an epidemic out of printing-ink. It was only a few days ago that an old lady, much interested in the treatment of hydrophobia by hygienic methods, as distinct from filthy Pasteurism, pointed out how in the great days of Pasteur, when hydrophobia was so much talked about, cases occurred with astonishing frequency in all parts of the country, where now we never hear of it. Perchance, however, the stringent muzzling order—the rigid carrying out of which, in spite of flabby sentimentalism, is something to be thankful for in these days—had much to do with this. To return to the cholera, the St. Petersburg correspondent of the *Standard* gives an anecdote related by Prince Mestcherski. The Prince was told by an ex-mayor that when he once proposed, during the last cholera epidemic, certain necessary sanitary measures, a member of the Duma (the Municipal Council) got up and declared that dirt was a national characteristic dear to every Russian, and far from endeavouring in this respect to imitate European civilisation, every true Russian should strenuously oppose all efforts to extract him from his national filth. This speech was received with frenzied delight, and the whole Duma repaired to the church to pray for deliverance not from the cholera, but from the reactionary mayor. As a sequel to this, the priest refused to perform the prayers, on the ground that it would be equivalent to praying for the death of a fellow-creature. How far the story is to be taken seriously it is, of course, difficult to say; but we do know that very many sanitary reforms on the Continent are prevented by the prejudices of the people.

The "general tone" of A.A. *Notes* for July is decidedly rural, and savours much of holiday-making; otherwise I do not see any marked change from the old management. It is a safe number for me: the articles are unsigned, so that I cannot be brought to book by black heads or greybeards for any criticisms I may venture. As a matter of fact, there is not much to criticise, the number being decidedly light and superficial. Mr. Sidney Vacher explains that he has no wish or intention to injure the R.I.B.A., so that body will be able to get along, after all. How thankful both the Institute and Association ought to be that the great crisis seems past, and that the thundered anathemas of the high-art men have not shaken No. 9 to its very foundations!

GOTH.

Her Royal Highness the Princess Mary Adelaide, Duchess of Teck, will lay the corner-stone of the permanent Church of the Good Shepherd, Mansfield-road, Hampstead, on Saturday afternoon in next week, July 23. We illustrated the church, which is being built from plans by Messrs. James Brooks and Son, in our issue of the 17th ult., from a drawing now on view at the Academy.

The deputy-chairman of the London County Council, Mr. Hutton, opened on Saturday afternoon the third and last section of Rosebery Avenue, the new street from the Angel, Islington, to the Holborn Town-hall. This improvement was initiated by the Metropolitan Board of Works, and the roadway which has been constructed is 1,173 yards in length, and has running under it a large subway. In the course of the work of construction 2,382 persons have been displaced and subsequently provided for. The improvement has cost £353,526, but the outlay will be diminished by the sale of unused lands.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

THE BRITISH SCHOOL AT ATHENS.—The annual meeting of this school was held at 22, Albemarle-street, on Thursday afternoon, the 8th inst., the Marquis of Bute in the chair. The annual report was read by Mr. G. A. Macmillan. The hon. secretary stated that the financial position of the school was still very precarious, depending as it did upon a very limited number of grants and subscriptions. Lord Bute, in moving the adoption of the report, urged the continuity of Greek life, and deprecated the vicious tendency to write the history of Greece within artificial limits. Archaeology was the handmaid of history, whose monuments she studied, recorded, and preserved, and from the purely historical point of view the mosques near the Stoa of Hadrian and the great water-clock were as much monuments of the history of Greece as was the Parthenon itself. Indeed, they were historical monuments of a most precious type, because their meanness as compared with the ancient and national structures was, for whosever saw them, an instant and striking proof of the barbarism and degradation of the Turanian savages by whom they were created, as contrasted with the greatness of the noble Aryan race who created the other. He did not argue that where one historical monument hopelessly interfered with another, as the mosque with the Parthenon, the inferior should not be removed; but such removal should only be effected after the greatest consideration, after making accurate records of what was to be destroyed, and with the careful preservation and transference, if need were, to another site of the historical monuments disturbed. From this standpoint he pleaded on behalf of mosaic floors of the Roman period, some of which he had seen in the actual course of destruction in the neighbourhood of Athens, and also advocated the study of the Byzantine monuments, both ecclesiastical and secular, the latter including the buildings of Mistrá, crowned by the Gothic Imperial Palace, inhabited at the time of his accession by Constantine XIII. Mr. Edwin Pears, of Constantinople, remarked that Byzantine work offered a field which had been practically untilled. Dr. Waldstein bore testimony to the value of the work of the British School. The Greek Minister (M. Gennadius) moved a vote of thanks to the chairman, which was seconded by Professor Jebb, M.P., and carried unanimously.

SUFFOLK INSTITUTE OF ARCHÆOLOGY.—On Thursday in last week a large party of the members and friends of the Suffolk Institute of Archaeology and Natural History had a ramble through what is well known locally as the "Garden of Suffolk." The Rev. Francis Haslewood, the hon. secretary, acted as guide for the day. The members proceeded by rail from Ipswich to Saxmundham, and thence visited by brakes the church and Wool Stاپlers' Guild-house at Kelsale, Yoxford Church, Sibton Abbey (where Mr. W. H. St. John Hope gave an address), and Dunnington Church (at which place Mr. T. E. Key read a paper).

Excavations are being made with successful results in a barrow situate within the supposed Roman camp at Grassington. The mound contains four chambers, and it is in the central one that interesting relics have been discovered, together with a large quantity of human remains. Five human skulls have been noted, with other portions of the bodies to which they have belonged. Fragments of four urns have been found, and also white flints, flint arrow heads, and a bone pin. The work is being conducted under the direction of the Rev. Bailey J. Harker, F.R.A.S.

A block of parochial buildings erected on the Victoria Estate, Wellingborough, in connection with All Saints' Church, were dedicated and opened last week by the Bishop of Leicester. The edifice, which is situate at the corner of Winstanley and Strode Roads, provides accommodation for infant day-school, Sunday-school, church institute, Bible classes, &c. It is built of red brick, with Bath stone dressings, and covered with Brossley tiles, from designs prepared by Messrs. Talbot Brown and Fisher. It consists on the ground floor of a large hall, and a classroom, cloak-room, &c. On the first floor are a suite of rooms for general parish purposes, and in the basement is cellars accommodation and a heating apparatus. Mr. G. Henson was the contractor. The cost was about £1,760.

OUR STREETS AND FOOTWAYS.

MUCH convenience would be felt if the City authorities turned their attention to the requirements of street traffic. All know the serious daily block that takes place between the Bank and the Mansion House, or even across King William-street, during a busy hour of the day, how difficult it is to find a way through the lines of omnibuses and cabs. A subway would give immediate relief to this congested focus of City life; but the City has to depend on the initiative and enterprise of a newly-formed tunnel railway company to supply this urgent need, and it is, of course, uncertain as yet whether the company will fulfil its fair promises. The subterranean obstacles to the projected scheme of subways are undoubtedly formidable; but there can be no real difficulty in uniting the pavements by foot-bridges, sufficiently high to allow headway for omnibuses and laden waggons, and the only objection that can be raised to such structures is their appearance. They may be very unsightly straight girders, spoiling the vistas of our streets, or artistically designed erections with ascending staircases suitable to the locality. Some communication is absolutely demanded at our principal crossings, and as necessary evils it is time they received attention. The repeated breaking up of roadways and footways in the City is another source of great public inconvenience. What with gas, water, and electric lighting companies, there is little prospect of a cessation of these tiresome operations, or of our pavements resuming their normal condition. Would it not be far more sensible to make companies lay down concrete or iron subways or channels with proper coverings, so that they may be opened without trouble, and the breaking up of wood or asphalt paving. Nothing appears more crude and clumsy than digging new trenches and laying pipes and channels every time a new company obtains powers. The Legislature should insist upon a more rational system.

THE ARCHITECTURE OF THE FIFTEENTH CENTURY.

THE third and last of a series of three lectures on the history and development of English architecture, by as many distinguished architects, was delivered by Mr. T. Graham Jackson, A.R.A., M.A., to the students of Toynbee Hall, Commercial-street, Whitechapel, on Wednesday evening. The lectures, which were organised by the council of the East London Antiquarian Society, have followed each other, in proper chronological sequence, at a month's interval. The first, by Mr. Aston Webb, V.P.R.I.B.A., delivered on Wednesday, May 11, had as its subject, "The Architecture of the Eleventh and Twelfth Centuries"; the second, by Mr. Alfred Waterhouse, R.A., given on Wednesday evening, June 8, carried forward the story to "Architecture of the Thirteenth and Fourteenth Centuries"; while, in the closing address, Mr. Jackson dealt with "Architecture of the Fifteenth Century." In his introductory remarks, the lecturer of Wednesday evening sketched in some detail the changes and developments in Gothic architecture which led up to the Perpendicular, or, as the late Edmund Sharpe more correctly named it, the Rectilinear style. Illustrating his points by numerous blackboard drawings, Mr. Jackson demonstrated that Pointed architecture was the outcome of expediency and economy, the use of the pointed arch allowing of the use of smaller stones than did the round arch. That it was at first adopted for purely constructional reasons was evident from the familiar fact that in the earlier examples of Transitional architecture pointed arches were employed to carry the weight and to cover large spans, while the older round-headed ones were retained as decorative features. The Gothic style was essentially one of unrest and progress; it never remained stationary. Its builders were never content with the progress already made, but each new constructional problem solved, each fresh step forward was but a 'vantage ground from which to move onwards to attack a more difficult position. A point of great importance was that the Gothic style throughout was essentially a masonry style, and its development was clearly shown by its treatment of windows and vaulting. The windows, for example, which at first were isolated lancets, were brought together in couples and in triplets, and the group was then

inclosed under a common head, which was next pierced; the piers between the windows were gradually reduced to mullions; the spandrels on either side of the circular opening in the head were pierced. At first the piercing was the principal motive of the window, but soon the bar separating the lights, and not the lights themselves, became the chief object of the designer. This change, the stages in which were elucidated by Mr. Jackson by blackboard sketches, first introduced in France, soon spread to England, and speedily developed in this country, resulting in the rebuilding of abbeys and churches on a scale of great magnificence and splendour. The builders of France used for a longer period this Geometrical phase of art, and, indeed, developed it into a thoroughly uninteresting and rigid style. Whereas for the motives of our 13th-century architecture we must admit our indebtedness to French architects, on the contrary the art of the 14th and 15th centuries was entirely our own in development, and owed nothing to France. Indeed, the examination of dates proved that the Flowing style was not adopted in France till we were on the point of abandoning it. Further, our Perpendicular style was peculiarly English, and, in the lecturer's judgment, was not surpassed in some respects by the art of any country. Incidentally, Mr. Jackson remarked that he had adhered to the titles given to the course of lectures, which appeared to group the successive developments of Gothic architecture into as many centuries; but in fact the periods, except in the 14th century, did not correspond with these arbitrary dates, and the Perpendicular style of which he wished principally to speak, although nominally a 15th-century style, was seen in full vigour in 1375 at Gloucester Cathedral, at William of Wykeham's College at Oxford in 1380, and the same builder's work at Winchester in 1387. They had now arrived at the period when Gothic art was entering on its last stage; within less than 300 years from its origin it had attained its full growth, every difficulty had been mastered, and every constructional problem solved. Nothing, indeed, seemed to have daunted the Gothic builders. From first to last, as he had already remarked, Gothic architecture was pre-eminently a stone-cutting style; the master-masons were throughout the architects of the churches and other buildings. The lecturer traced the development of the Curvilinear into the Rectilinear window. The tangential curves of the window tracery had suggested ogee forms, but now the bar tracery was carried up to the head of the window, which was next increased in width, to afford greater light and room for single-figure subjects. The head of the window was now flattened into a four-centred curve, and eventually was perfectly horizontal. The head of the window was divided into rectangular compartments, by mullions which were either cinquefoiled or battlemented. The mouldings became simpler and shallower, and this was equally marked in the piers carrying the arcades of the church, where both in profile and on plan the pier and its abacus assumed a diamond outline. The foliage capitals, the glory of the Curvilinear style, now very rarely occurred, and where they were introduced were not nearly so well designed as in earlier examples, but moulded caps were almost universal. One of the worst features was the falling off in sculpture; it was now very seldom employed, and where introduced, as in Henry VII.'s Chapel at Westminster, was inclosed in panelling, of which one could soon have too much. A great development was apparent in vaulting. The quadripartite vaulting changed into rib-and-panel treatment, in which the panel was merely subsidiary, and was frequently filled in, the ribs forming the only constructional feature. More interlaced ribs were introduced, bosses were placed on the intersections, and were gradually made more and more conspicuous features, and the ribs were all struck with curves of the same radius, so as to facilitate the work of filling-in the interspaces. Whereas the void left in a single bay of a quadripartite vault was a hollow-sided inverted pyramid, the figure formed by the void left in the new system was a hollow-sided regular cone; the plan of the first-named vault was a rectangle at every point in its height, and that of the latter a circle or ellipse. Soon the builders sought to define the cone formed by the fan-tracery by girdling it with circular bands, the plane for treatment being now regarded as horizontal

instead of vertical as before. The idea of transverse and diagonal ribs was lost, and a system of hollow cones was substituted for them. The intersecting lines as they multiplied lost their rib-and-panel motive, and in many instances, as at Henry VII.'s chapel at Westminster, both rib and panel were worked out of the same stone, and became a mere surface decoration for the lower side of the vault. It was probable that this fan tracery was first developed in roofs of the cloister walks of our abbeys, and the earliest known example was that in the cloisters at Gloucester. The lecturer referred to the magnificent effect of the style as carried out at Gloucester, King's College in Cambridge, and Henry VII.'s chapel, remarking that the latest example was at Christ Church, Oxford, executed in 1604. The woodwork of this Perpendicular period, notably as displayed in stalls and roofs exhibited great excellence and skill, and a knowledge of the special treatment adapted for the material as distinct from masonry. No such hammer-beam roofs as those of Westminster Hall, Eltham and Hampton Court palaces, and in many of our great churches, were to be found on the Continent. The style did not quite die out till the end of the 18th century, and there were many proofs that it was still followed in many villages and out-of-the-way parts of the country until that period. In conclusion, Mr. Jackson urged that the true aim of architecture was to construct beautifully, and not, as he was sorry to say Ruskin and many other writers and architects had held, to decorate our constructions.

DECORATION.*

MY subject, "Decoration," is a very wide one; but the limitation of time and other considerations urge me to confine my observations chiefly to the practical aspect of it. I might begin by sketching an outline of the historical development of decorative art, for as you know, the impulse to decorate is a universal instinct implanted in the human mind. There is scarcely a savage tribe that has not its characteristic ornaments. And even before he has learned to build a hut, or to clothe his nakedness, the savage will adorn his person with coloured pigments or tattooing, and often in devices admirably adapted to bring into relief the curvature and undulations of the body. The New Zealander is pre-eminent in this art. It is tempting to give an outline of the styles of ornament which have characterised the nations of antiquity, and to trace the symbolical meaning attached to the forms that most prevailed in each. Most of the examples that have come down to us are from their sacred buildings, and most of the ornamental forms have a sacred and symbolical meaning. Ornament is chiefly founded on plant and animal forms (of course, meandering lines of all kinds are an exception), and those plants and animals chosen for the purpose of religious symbolism were thought to express in their forms or qualities some characteristic observed in the economy of nature. Thus, her creative or generative power they thought they saw expressed in the bull and the lion. The serpent throughout all ancient religions was held in great veneration. We find that among the Hebrews it was held sacred. Moses lifted up a brazen serpent as a symbol of healing; the Greek demigod, Æsculapius, the patron of medicine and the healing art, was always accompanied by the serpent. The rod of Hermes has the male and female serpents entwined around it. Over the portals of Egyptian temples double serpents uphold the solar disc. Serpent worship to this day is prevalent throughout India. There are serpent mounds sometimes of several miles in extent spread over the old and new worlds. The serpent typified many things in ancient times. It is a mysterious creature, in whose eyes abide a weird fascination. It seemed to renew its youth by periodically casting its skin. When coiled in a circle with its tail in its mouth, it had an occult meaning, signifying perpetual generation. We see the serpent exalted into heaven as one of the constellations. In early developments of symbolic art the forms are chosen not for their inherent beauty, but for their meaning solely. So that, on the whole, symbolic styles, such as that of Egypt and the early

* Paper read by Mr. ANDREW WELLS before the Sydney Architectural Association.

Christian, are not so exquisite in form as in those styles where beauty alone is sought after, as in the Greek work and that of the Renaissance. The beetle, among the Egyptians, was held in great veneration also. It is difficult for us to understand the reason why, until on closer examination we discover the motives that influenced their choice of so insignificant a creature, for the scarabæus, or beetle, appears in Egyptian art more frequently than any other form, except the lotus-lily. The beetle lays its eggs in a little mass of excrement, and this it drags by its hind feet along the ground until it hardens in the sun; this it then buries in the earth, and in due time, quickened by the solar rays, the new birth emerges. The Egyptians seemed thus to see in the action of the beetle on a small scale, the action of the sublime Creator in the wide theatre of nature, and this likeness sufficed to endow this little creature with a divine character. Many plant forms were chosen for decorative purposes, for the like reasons. The lily or fleur-de-lis, which we now accept as the symbol of purity, is much older than the Christian religion. It and the trefoil leaf have long been used to typify the process of nature in its threefold aspect, such as the past, present, and future, the begetter, the preserver, and the destroyer, the male and female principle, and the products of these twain. In Egypt they had many inferior deities, but one great trinity, Osiris, Isis, and the child Horus. Hebrew ornament was altogether symbolical: the æsthetic principle finds no place in its art; it made no advancement. I might go on explaining why all manner of plants occupy such a large place in art and poetry. Such as the laurel, the bay, the ivy, the mistletoe, the pomegranate, and many others; but this takes me rather out of my way. But as showing how great the influence of religious symbolism has been on architecture and decorative art, we have but to think of the cross—exalted into a symbol of the passion of our Lord, and the redemption of mankind, it now forms the ground plan of all the great cathedrals of Christendom. If the cross had not thus been invested with this sacred character, our great temples erected during more than a thousand years would have been something different. Who can say how great the difference may have been? This is an aspect of my subject I would fain dwell upon; but I must confine my observations to something touching, more closely our present interests and every-day experience. A survey of the past shows us that all nations in all parts of the world have loved to decorate their temples, houses, dress, furniture, and almost every article of utility, and as in the case of Greece, we see how refined a nation so inclined may become; not to mention their matchless temples and statuary, which we may suppose the inspiration and product of their greatest artist. What chiefly concerns us here is to observe that whatever their artisans and common workmen fashioned is indued with grace, symmetry, repose, and elegance. The mason's work, such as altars, milestones, urns, and such-like, are all distinguished by these qualities. Think of the marvellous shapes of grace—the patterns, hand and eye created; how varied and how delicately fair in form; and thousands of such urns and vases fill the shelves of our museums, not one of which is crude or ungainly made. Hundreds of workmen must have shaped them on the wheel—common workmen, who yet could fashion works so very uncommon—art workmen were they all, imbued with the spirit of loveliness. What shall we say of the painters who further graced them with the perfect forms of gods and heroes? What delicacy and subtlety of touch do their firm, free lines declare! Think of the many hands engaged in this one branch of art! Here again we see the art workman who loved his work, and put his heart and soul into it. Then, how exquisite the beauty of their ornamental forms! They are the very embodiment of grace and refinement. They must have been inspired with the spirit—art. Their workers in gold and bronze are no exception. All the things they fashioned are to this day models of grace and beauty—their furniture, dress, and all their commonest things were transformed by this spirit into dreams of beauty. Our English poet Keats, who was a Greek in spirit, has declared a thing of beauty to be a joy for ever. And so, indeed, it is. Now, how do we stand in Australia as compared with the Greeks? I think that even the most patriotic must (however reluctantly) confess we do not approach

them by a long way. I am sorry to say the ordinary productions of our workmen are not distinguished by elegance of form and delicacy of finish. It is well for us to be reminded of our state, and by the example of Greece discern the goal toward which we ought to strive. A little nation were they—and not so rich as we—but their lives must have been glad and beautiful; their minds enriched with truest wealth, seeing that whatever they touched became things of beauty in their hands. While speaking of decorative art throughout the world, it may be well to say something on the subject of colour generally. This is one of the subjects that nearly everyone thinks he is an authority upon, and yet there is no topic upon which more ignorance and error prevails. A lack of knowledge prevails of what other nations have accomplished; what they throughout centuries have found to be good. A foolish notion prevails that full, rich colouring is vulgar, or is in bad taste. A belief prevails that in a warm, sunny climate rich, full colouring is unsuitable. A belief exists that dead, grey hues afford a refreshing coolness, pleasing to the eye, overlooking the fact that all the nations who are pre-eminent for their mastery of colouring inhabit sunny climes. We have only to enumerate the nations so famed to be assured of this. Think of Egypt, where they have even more sunshine than we have in sunny New South Wales, and then consider the colours they delight in. Their temple walls, within and without, and their vast columns were coloured in rich shades of ochrey-gold, the figure-painting and hieroglyphic writing brought out in deep shades of chocolate-brown; the capitals resplendent with ultramarine, white, and the richest shades of red. Their ceilings were grounded with dark blue, and the diapered patterns which crowned them shone with all the richest primary colours. Their whole scheme of colouring was full and rich—everything was decorated; even to their mummy cases and the sepulchral cases wherein they were bestowed, their colouring was full of tone and harmonious. Think of China and Japan! They are sunny lands, and both these nations are supreme as colourists. Colour does not need to be washed-out and insipid to be pleasing. It is like music, and must be harmoniously arranged. It may be gay and joyous in effect; only group colours in due proportion and proximity, and the effect will be harmonious. Think of India and Persia! how beautiful is their colouring. The beauty of their textile fabrics (such as carpets) has never been excelled. Then, when you look at decorated buildings laid bare in the excavations of Pompeii, you see what the refined Greeks and Romans thought in the matter of colouring. It was mostly Greeks who executed art work in the palmy days of Rome. Here, again, you have dark blue ceilings, and walls painted in divisions and panellings. It is common to have black dadoes and walls of rich red, broken up with pilasters and panels of black and yellow-white, and other lustrous-coloured friezes. The figure painting and ornamentation is all in rich, full tones. The Italians, who now inhabit the same country, delight in rich colouring to this day. So here you have all the great civilisations of the world agreeing in their choice of splendid colouring. It will be a long time e'er we can afford to despise the taste and judgment of so many accomplished nations. Rather let us acknowledge our ignorance, and so be in a fit condition to learn from better men. Another fact that is constantly borne in upon mind in the ordinary experience of life is the vanity and self-sufficiency of those who pretend to the possession of taste and knowledge in the absence of long and serious study. Should we call in the services of the physician, the lawyer, engineer, professor of music, or any specialist, we do not presume to dictate to him the course he ought to pursue. We recognise the folly of such procedure. But when it comes to matters of taste in form and colour, it is assumed that the individual untrained judgment is as good—if not a great deal better—than that of him who has spent his life in the acquirement of knowledge in this particular direction. A thorough knowledge of the true principles of the harmonious combination of colours is one of the rarest qualities, and can only be attained after long experience and study. True principles of art are still little developed amongst us. What do we see in most houses we enter? An utter want of unity between the painting and the furnishing. The carpets, curtains, and chair-coverings having no relation to the

wall-colouring, thus showing the want of a trained guiding mind in the selection of the whole. How often do we find the pictures hung without the remotest feeling for artistic arrangement! It is not uncommon to see them placed so high upon the walls as though it were a prime object to place them where they could not by any possibility be seen or enjoyed. But now at the threshold of our inquiry, one is confronted with the question: What then is good taste; and what constitutes good decoration? These questions cannot be answered in few words. Nothing is so common as to find the public taste running after fashion—the prevailing mode being ever esteemed the height of good taste. During the last twenty-five years I have seen many changes of fashion—in wall-papers for instance—and each during its reign has been hailed as the best and far surpassing anything that went before it. Now during all this time the skill in design and colouring brought to bear on this particular manufacture has been very great. The designs have been supplied by the best architects and artistic designers, so that at no time during the period under consideration have the designs or colouring been in bad taste—(of course I refer to the productions of the best houses) yet anyone having experience constantly finds the public to be led away with the idea that what prevailed last year, or a few years ago is old fashioned and consequently in bad taste. While during all this time the chief writers on the subject, and the recognised leaders of taste have all along consistently recognised the worth and pointed out the beauties of each year's production. Now it is quite possible for many kinds of design and colouring to be beautiful, and what was good twenty years ago need not cease to be good and beautiful simply because the fashion may have changed. William Morris the poet, and art decorator, has insisted on this truth for the last twenty years. He produced artistic wall-papers then, and has added little to the number of his designs since, but still produces what from the first he knew to be good for the adornment of our walls. And so with Jeffrey and Co.'s—wall-papers and designs they brought out twenty years ago they still print, and these are still their finest designs. Of course, as business men they bring out fresh designs yearly, for the sake of taking the market; but it does not follow that the last brought out is the best. The same might be said of furniture: there have been many changes of fashion during the last thirty years, yet during this time greater skill has been brought to bear on its manufacture than at any time in the history of the English nation. We have been going through a period of great fertility of invention in all the arts of design; but in France there has not been this listless love of change, yet he would be unwisely bold who ventured to say the French are lacking, or in any way inferior to ourselves in the matter of taste. So that the suggestion made as to what is good and suitable for decorations of our houses must be understood to be merely a selection out of many ways that would each be good under special conditions.

(To be continued.)

BOOKS RECEIVED.

Pumps and Pumping, by M. POWIS BALE, M.I.M.E., second edition revised (London: Crosby Lockwood and Son).—The author of "Woodworking Machinery, Saw Mills," and "A Handbook for Steam Users," &c., has usefully brought together, in a small compass for practical use, notes on the selection, construction, and management of pumps. Very numerous and varied are the types of pumps which are here classified. Five kinds are treated: (1) lift pumps, (2) plunger or force pumps, (3) centrifugal and rotary pumps, (4) mechanical water-lifters, and (5) injectors. Mr. Bale is an expert in mechanical contrivances, and has given the results of his practical knowledge on the points to be considered in successful and economical working. The tables and rules are simply and clearly expressed, and we can safely recommend the book to every contractor and pump user. —Notes on the Construction of Cranes and Lifting Machinery, by EDWARD C. R. MARKS, M.I.MECH.E. (London: John Heywood, Amen Corner).—The author has here published in book form a series of articles which have appeared in the *Practical Engineer*. As the information concerns a class of machinery about which

little has been specially written, we have no doubt Mr. Marks's little treatise will find numerous readers, especially among builders and engineering contractors who have brought lifting machinery into considerable use. The rules and examples illustrated by diagrams are simple and concise. Many important improvements in pulley-blocks and cranes of different kinds are described. The author's notes will enable any one who has a slight acquaintance with machinery of this kind to judge for themselves of the capabilities and merits of the usual appliances, from the simple pulley-block to the dockyard crane capable of lifting hundreds of tons. The principles of pulley-blocks are first discussed without any complicated formula, and by very simple rules; next come crabs and winches, the means of obtaining the purchase or approximate power of the crab being shown in simple arithmetic; double and treble-purchase crabs, hand-cranes, and wall-cranes are treated, and from these to pillar cranes and foundry cranes the transition is easy. The subject of derricks is fully discussed, and the chapter may be read with profit by contractors who use derrick cranes in the erection of lofty buildings; the method of finding the stresses by diagram is shown; but we do not see any reference made to the patented gearing introduced by Messrs. Thompson and described lately by us. Other chapters deal with wharf cranes, overhead travelling cranes, steam and power hoists, warehouse cranes, cage lifts, and many other forms, lifting jacks, &c., in each case the author giving practical rules for calculation.

CHIPS.

A new Roman Catholic Chapel is about to be built at Harrington, Cumberland. The architect is Mr. Charles Walker, of Newcastle and Liverpool, and the contractor Mr. James Wilson, of Workington. The church will be built of grey and red sandstone, in the Early Gothic style, and will be about 100ft. in length.

A churchyard cross is to be placed opposite the porch of Church Eaton church as a memorial to the late Col. Ashton. Mr. Bridgman, of Lichfield, is the sculptor.

Messrs. A. and C. Harston are the architects of the new workhouse infirmary at Lewisham, the foundation-stone of which was laid last week.

The third annual convention of District Councils of Plumbers of Scotland will be held at Dundee on September 7th, 8th, and 9th next, and will be attended by a deputation from the Worshipful Company of Plumbers of London.

The burgh engineer of Edinburgh has been instructed to prepare for the town council a report on the cost of the proposed Bristo-street improvement. It is expected that the cost will not exceed £20,000.

The memorial tablet to the late Earl of Lytton is to take the form of a medallion tablet in the crypt of St. Paul's Cathedral, and the work has been entrusted to Mr. Alfred Gilbert, A.R.A.

The Louvre has just received as a gift a small mediæval harp in ivory, sculptured with the figures of angels and strewn with *fleur de lys*. It belongs to the beginning of the 15th century. Just such musical instruments may be seen in the hands of angels in Flemish and French pictures of the time.

The secretary of the Royal Commission on Labour informs us that the work of taking evidence of Committee "A" and Committee "B" will be completed in the weeks commencing July 25th and August 2nd respectively, and that the work of taking evidence of Committee "C" will be completed after two or three weeks' further sittings. Any persons still wishing to give evidence before any of these committees should at once apply to Mr. Geoffrey Drage, at 44, Parliament-street.

The Art Gallery Committee of Aberdeen have obtained on loan a collection of pictures from South Kensington, numbering in all 107, besides a number of canvases from local gentlemen, and on Saturday the exhibition was formally opened, free to the public for three months, by Lord Provost Stewart.

Mr. G. F. Watts, R.A., who intends to present to the nation a collection of his works, is now engaged on the picture which is to complete that collection, and has selected as the subject of this work a portrait of Sir Andrew Clark, the President of the Royal College of Physicians.

Albert Walters, a builder, on bail, was convicted at the West Kent Quarter Sessions, on Friday, of stealing mantelpieces, window-frames, scaffold-poles, drain-pipes, and timber and wood, the goods of Frederick Adam Stigant, at Chatham. Prisoner was sentenced to six weeks' imprisonment.

Building Intelligence.

EARLSTON.—The new parish church at Earlston was opened on the 6th inst. by the Right Rev. Dr. McGregor. It is erected from plans by Messrs. Hardy and Wright, Edinburgh, in Early Decorated Gothic, with accommodation in the pews for 650, and with extra chairs for 700, at a cost of nearly £3,000. It has nave and aisles, the latter having each three gables for upper lights to side galleries, an arrangement rendered necessary by the restricted site. The church has a tower, and all interior appointments are of a superior description. The pulpit and accessories are in oak. The roof is open, with panelled timber ceiling. The walls are finished with distemper, in primrose yellow and terracotta. All the woodwork is stained and varnished a dark walnut.

HITHER-GREEN.—The foundation-stone of the new church of St. Swithin, Hither-green, was laid on Saturday week. The church, which is being erected from the designs of Mr. Ernest Newton, of 14, Hart-street, Bloomsbury, by Mr. S. C. Parmenter, of Braintree, will be in the 14th-century style, faced with red brick and with Bath-stone dressing. It is to seat 600 persons. The present contract is rather under £5,000, it being decided not to go further at first than with the erection of the nave and north and south aisles and the west gallery, leaving the chancel and the chancel aisles to be the subject of a future contract. The church will have an open-timbered roof, covered with green slates, the windows will be filled with plain glass, while over the chancel arch it is intended to place a bell turret covered with lead. This portion of the work, it is expected, will be completed within twelve months. When the whole scheme is carried through, the total length from east to west will be 120ft. At present the dimensions are as follows:—Nave, 66ft. long by 30ft. wide; north aisle, 66ft. by 12ft. 3in.; south aisles, 66ft. by 19ft., extreme exterior height to the apex of the gable, 58ft.

HORSHAM.—The new cottage hospital for Horsham was opened on the 2nd inst. The building is executed in red brick up to the first floor, and above this in half-timber work, filled in with rough cast plaster, the front portion being hung with Sussex tiling. The roof is covered with Broseley tiles and is broken up by gables having wide projecting eaves and moulded barge boards. On the ground floor are the entrance hall, with wide staircase leading to the wards on the first floor, garden entrance for patients, with w.c. adjoining, waiting-room, nurse and matron's sitting-room, urgency wards, medical stores. The domestic offices are entirely shut off. A lift is provided from the kitchen offices to the third floor. On the first floor are one male ward with three beds, provided with lavatory and w.c.; one female ward with three beds, one ward with two beds, nurse's room, surgery and operating room, bath room and lavatory, linen closet with hot tank inclosed. At the extreme end of the site are the mortuary, coal cellar, and fitted laundry. The cost of the building was £1,350. The work has been carried out by Messrs. Rowland Bros., of North-street, Horsham, from the designs of Mr. Frederick Wheeler, F.R.I.B.A., of Horsham and Chancery-lane, W.C.

LEEDS.—New printing offices are being erected in Cookridge-street. The building covers an area of 450 square yards, and will be five stories high. Messrs. William Thompson and Sons, of Chapeltown, are the general contractors; Mr. J. E. Pearson the carpenter and joiner; and Messrs. Homan and Rodgers, of Manchester, supply the constructional ironwork. The architect is Mr. Harry May, A.R.I.B.A., of Liverpool. The style is Italian Renaissance, with a Queen Anne freedom. The basement will be used as the principal printing machine-room, and here also will be the engines for driving the machinery throughout the works. A large lift runs from top to bottom of the building, and a separate fire-proof staircase for the workpeople is also provided. The main entrance is at the corner of two streets, and is a feature in the design. On the ground floor are placed the counting-house, proprietors' room, wholesale stationery department, another machine-room, and packing-room. From the hall a staircase in wood leads to the first floor, upon which are situated the manager's room and offices, bookbinding and lithographic

departments, storerooms, &c. The second floor is for the compositors and stereo-room, and the third floor entirely for compositors. The walls of the basement are lined with white glazed bricks, and the other walls and ceilings are to be plastered. The exterior is broken up by gables, projections, and cornices. The lower portion of the outside walls is lined with blue Staffordshire bricks. The general walling is of red patent bricks, and the strings, cornices, &c., are of local stone. Above the main entrance is a stone oriel window, and then rises a tower to the height of about 100ft., the upper portion of which will be used as storerooms.

SHREWSBURY.—The chancel of St. Mary's Church was reopened on Monday week, after undergoing restoration. The unsightly seating and screens which were placed in the chancel about forty years ago for the use of the boys of the Grammar Schools (and since the removal of the schools to Kingsland no longer used by them) have been removed. The floor spaces have been levelled and the steps rearranged. The chancel and sanctuary floors are laid with encaustic tiling by Messrs. Godwin and Son, of Hereford. The steps are of polished Anglesey marble. A chancel screen of Grinshill stone has been erected, in four of the niches of which are placed statuettes of St. Mary, St. Joseph, St. Oswald, and St. Birinus, the work of Messrs. Earp, Son, and Hobbs, of London. The altar table has been brought further forward than formerly, thereby opening out the Norman arches in the east wall. A Norman sedilia has been exposed to view in the south wall. The arcade between the sanctuary and the South Chapel has been filled in with wrought-iron grilles, representing a vine, and the standards to the altar rail are the work of Messrs. Powell and Sons, Whitefriars, London. The general work and the stone screen have been executed by Messrs. Bowdler and Co., builders, Shrewsbury, and the architect was Mr. A. E. Lloyd Oswell, A.R.I.B.A., of that town.

UPPER POPPLETON.—The new church at Upper Poppleton, near York, was opened on Monday week by the Archbishop of York. The old church, which was in the Norman style of architecture, was built between A.D. 1150 and 1155, but the new one, erected on the same site, is in the Decorated style. Mr. C. Hodgson Fowler, F.S.A., of Durham, is the architect. The new edifice, which will accommodate a little short of 200 people, consists of nave, chancel, organ chamber, and vestry. At the west end is an arcade of three arches, supporting a small bell tower, surmounted by a shingled spire. The roof is of open timber work, with plaster panels. The nave is seated with open seats, whilst in the chancel there are oak seats for choir and clergy. The pulpit, altar, and other fittings are likewise of oak. The contractors were Messrs. Hick and Hobson, of Little Stonegate, York, and the clerk of the works was Mr. George Clark. The cost has been £1,900.

WELLINGTON, SOMERSET.—A cottage hospital at Wellington will be opened on the 20th inst. by Mr. Lawson Tait. The building provides nine beds, and contains, on the ground floor, entrance halls, male ward 24ft. by 18ft., nurses' sitting-room and committee-room 14ft. by 12ft., operating-room 16ft. by 12ft., head nurse's bedroom, kitchen, lavatory, scullery, store, &c.; also a mortuary. On the upper floor are a female ward 24ft. by 18ft., isolating ward 13ft. by 13ft., convalescent ward 21ft. by 12ft., nurses' bedroom, bathroom, and lavatory. The contract has been carried out by Mr. Follett, builder, of Wellington, under the direct supervision of the architect, Mr. E. T. Howard, of Wellington.

A dispute at Stafford between the local Odd Fellows' Society, with respect to a new hall which it is proposed to erect in Greengate-street, in that town, from plans prepared by Mr. Wormald, and Mr. Hambleton, owner of the opposite property, has been arranged through the arbitration of the President of the Royal Institute of British Architects, Mr. J. Macvicar Anderson. Mr. Anderson assessed the injury to Mr. Hambleton's ancient lights, should Mr. Wormald's plans be carried out, at £300, and the Odd Fellows have decided to accept the alternative and reduce the proposed height of the hall. Each party has to defray the costs of the arbitration in equal proportions. In consequence of the decision arrived at there is a reduction of £170 in the amount of the contract. The work will be proceeded with at once, Mr. W. T. Woollams being the contractor.

Engineering Notes.

THE AVIEMORE LINE.—Traffic over the first section of the new through line from Aviemore to Inverness was in full operation on Monday. The line from the junction at Aviemore to Carrbridge, a distance of a little over seven miles, was officially inspected by Major Marindin in the end of last week, and the running of trains was at once sanctioned. This section of the line was commenced in February, 1890, by Messrs. John Ross and Son, Fearn, whose estimate was £27,773, the company supplying the permanent way and fencing the line. The contractors for the section of the line from Carrbridge to Culdoich, some five or six miles from Inverness, have large squads of men at work, and there is a prospect of the whole of the new through line being opened at an early date.

THE PALESTINE RAILWAY.—The British Consul at Jerusalem, in his last report, refers to the progress of the Palestine Railway, which has now been in course of construction for the last two years. The concession was granted by the Porte in 1888 to a French company, and the works, which were calculated to cost about £240,000 but which will probably exceed that sum, are being carried out by a firm of French engineers. A little over one-half of the line has now been constructed, and the remainder will be completed in September or October next. The line from Jaffa to the foot of the mountains is in a fairly good condition, but it has not yet been opened to traffic. The part to be finished is that which lies between the Jaffa plain and Jerusalem, and which will follow one of the valleys leading up towards Jerusalem from the south-west. The length of the whole line will be 54 miles, or 17 miles longer than the present carriage road. When the line is completed a branch will be made from Ramleh to Gaza, possibly with the object of forming a junction with the line from Egypt.

CHIPS.

The city council of Norwich received on Friday the resignation of his offices by Mr. Peter Paul Marshall, the city engineer, architect and surveyor. Mr. Marshall was appointed in 1877, having previously held the post of surveyor to the local board of Stone, North Kent.

The parish church of Tong, Salop, has been reopened after restoration from plans of Mr. Ewan Christian. The contractor was Mr. Bowdler, of Shrewsbury.

The work of pulling down the remaining block of buildings in Rolls-yard, Chancery-lane, lately occupied by the Official Referees, is now in progress, and building operations in connection with the erection of the remaining part of the new Record Office on the site, will forthwith be commenced. The old Rolls Chapel, founded about 1233, will be converted into a kind of museum. The comparatively modern Rolls House will not be pulled down for some five or six years to come.

At a meeting of the Liverpool Overhead Railway Company held on Tuesday, the chairman admitted that the progress of their undertaking had been much slower than had been anticipated, but expressed a belief that they would have the railway in operation in October. There were only 48 spans required to complete the main structure. The electric plant for the motive power and the carriages were complete, and they had their electric station at Wellington Dock well in hand; indeed, it was almost complete.

Over £200 has been subscribed to provide a memorial to the late Canon Burrows, of Rochester. It will take the form of a font for that cathedral, the design for which has been furnished by Mr. T. Barp, of Kennington, and the font is to be of Hopton Gate stone, the groups and figures around it of alabaster.

The opening of the inclined railway at Bridgenorth took place on Thursday, the 7th inst. It will remove to some extent the inconvenience of ascending or descending the 200 steps separating the high town and the low town. Mr. G. Croydon Marks, C.E., of Birmingham, is the engineer, and Mr. Law the contractor. The route adopted is from the bottom of the Stoneway Steps to the end of the Castle Walk. The length of the track is 201ft., and the vertical rise is 111ft.

The Gorse Hospital, New Swindon, is being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke flues, and also by the patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.) To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL, XLI, XLVI, XLIX, L, LI, LIII, LIV, LVIII, LIX., and LX. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

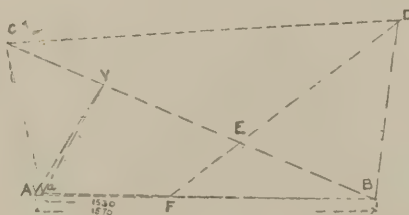
RECEIVED.—J. M. B. and Co.—B. L. and W. T. Co.—Chas. Francklyn.—Samscri.—F. G. R.—Geo. R.

Correspondence.

LAND SURVEYING.

To the Editor of the BUILDING NEWS.

SIR,—I fail to see how Mr. Cobham mends his position by his explanation in your last issue but one. I have always understood that the main line must be laid down first, and that in a four-sided figure the diagonal was the main line. Of course a man may put his horse in the shafts with his head to the splash-board, and drive the gig backwards if it please him; but his neighbours will take a lot of persuading that such a method of procedure is the correct one. Mr. Cobham either fails to understand my meaning, or ignores my point. DEF may be a check on the direction of BFA, but none on the length of FA, as the appended diagram will show, where



FA is 1,570 links in length, and FA 1,530 links (a common counting error, as Mr. Cobham may know), CA and CB being each the same length, yet BFC is so unchanged in direction that even on a scale of three chains the length DEF would not alter more than two or three links, an error which many an easy-going surveyor would

fail to detect, or would pass as "near enough," whereas my check, which ought to run from A to Y, and measure about 592 links, would run from A to Y, and measure only 567, a difference indicating beyond all doubt a considerable screw loose somewhere. Even were the line measured 1,670 links, that is a hundred links too long, DF would only vary five links, or thereabouts.

My construction, Mr. Cobham contends, has the same fault, and my BZ is left unchecked as much as his FA. Very well. I have shown him how a mis-measurement of 40 links in FA would fail to be detected by DF; will he show us by diagram, as I have done, how, keeping CD and DB the same length, it is possible to alter the length of BZ 40 links without the error being at once, and beyond all manner of doubt, detected by DZ, owing to the alteration in position of D? Such an error would, as a matter of fact, alter DZ from 827 links to 815.

As to my status, if my construction is faulty, incorrect, and misleading, not all the letters of the alphabet tacked on to my name can make it otherwise. The same remark applies to Mr. Cobham, and your readers must judge between us. As to my experience, if it has led me to adopt a better system than the one which contents Mr. Cobham, large or small, it will have been of more practical value to me than his has been to him.

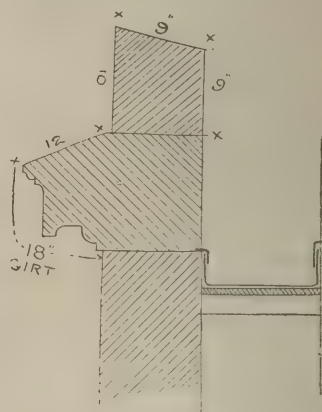
Mr. Cobham takes exception to my condemnation of his other figures, and tries to throw dust in your readers' eyes by hinting that I condemn them merely because of a fault in Fig. 5. I did so because the fault is repeated in them. I will point out one instance. In Fig. 4, DB might be chained 30 links long or short without DE unmistakably showing the error—that is, without the direction of C.D.B. being altered more than a link or two. If Mr. Cobham cannot see any further instances in his diagrams, I am sorry for his capacity to learn correct surveying, if he will pardon my speaking so plainly.—I am, &c.,

NORTHMAN.

Intercommunication.

QUESTIONS.

[10807].—Stone Cornice.—Will some reader please inform me whether the following is the correct way of



measuring the labour to stone cornice and blocking course to a wall, say, 10ft. long, as shown in sketch?

ft. in.		Waste.
10 0		ft. in.
2 4		0 10
23 4	Labour plain face.	0 9
10 0		0 9
1 0	Do. plain weathering.	2 4
10 0		
1 6	Do. moulded face.	
	(Beds and joints not measured.)	

—QUANTITIES.

[10808].—Wood-Block Floors.—Can any reader say if pitch-pine blocks 1½ in. thick are reliable for a floor that is subject to considerable variations in temperature, or whether a different kind of wood is preferable?—ASHTON.

[10809].—Pitch Pine.—One authority says: "Pitch pine should not be used for timbering purposes where subjected to any great strain, nor in positions where it is not freely exposed to air." Another authority recommends (among other woods) pitch pine to be used for "great strength in construction." Will friends kindly give their early opinion on these two seemingly conflicting statements? Would there be any objection to the use of pitch pine for bressummers and story-posts to shop fronts? The bressummers would be in two halves, with iron or steel plate between, and both bressummers

and story-posts would be exposed, and painted or varnished.—J. H.

[10810].—**Drainage.**—I shall be glad of suggestions how to deal with the drainage of a hospital, no sewers being available for the sewage! The site is at an altitude to allow for the gravitation of sewage on to adjoining land.—ARCHITECT.

[10811].—**Paris.**—Can any reader of the "B. N." tell me what prospects there are in Paris for an architectural draughtsman (Englishman) who has just completed his articles with a well-known provincial architect? Also the names of the principal architectural papers published in Paris!—DATA.

[10812].—**Geometry.**—Will any of your numerous readers kindly tell me the books most suitable to study from for the honour, practical, plane, and solid geometry, with their prices and publishers? One of the books to be or include perspective.—GEOMETRIC.

[10813].—**Wood Block Flooring.**—I should be glad of information as to the composition of a good mastic for bedding wood block flooring on a large scale!—F. E. H.

[10814].—**Bricks.**—I would feel obliged to any reader for a reply stating a fair average number of bricks a bricklayer ought to lay in a day of 10 hours in the building of a cottage, whose external walls are 12in. thick, that is, two half-bricks tied together with iron ties, having an air-space of 3in. between. The partitions on the ground-floor are 4½in. thick. The bricks are laid in cement mortar, and the inside of the cottage is to be plastered.—BRICKLAYER.

[10815].—**Building Estate.**—Will some fellow reader say what the usual charge is for making plans for, and staking out, land in plots for building purposes, including setting out roads, &c.? In all, about 25 acres.—N.

[10816].—**Saloon Floor.**—Will some of your numerous and experienced readers give their opinions as to what is the most suitable wood for floor of dancing saloon!—EATON.

REPLIES.

[10800].—**Blackboard.**—Hawes' blackboard composition dries instantly and thoroughly hard, and can be applied by any inexperienced person. Shake the bottle well before removing the cork, pour out sufficient for your purpose, and apply with an ordinary paintbrush. It is prepared only by G. E. Hawes, school desk manufacturer, Duke's Palace Steam Joinery Works, Norwich.—G. E. H.

[10811].—**Wet in Coach-House.**—If lean-to roof has 16ft. span it should rise 10ft. 6in., and slates have a bond of 3in. pugged inside, to keep out wet.—J. G. GUY.

[10802].—**Cracking of Boiler Masonry.**—Pull out boiler fixings, and build up same in brickwork bonded together with layers of hoop-iron every four courses, interlaced at corners and angles.—J. G. GUY.

CHIPS.

A public meeting has been called for this (Friday) afternoon, at 4 o'clock, at 20, Hanover-square, by the permission of the Library Association, to consider the desirability of the formation of a society for the study of Bibliography, and the basis on which it should be established.

At the monthly meeting of the Rawdon local board, held on Tuesday week, a letter from the Local Government Board announced that the provisional order for carrying out a system of sewerage for the township had been sanctioned. Instructions were given to apply to the Local Government Board for a loan in order to carry out the work, under the superintendence of Mr. W. H. Radford, C.E., of Nottingham.

From a report just issued it appears that the total cost of the Glasgow municipal buildings, of which Mr. William Young was the architect, was £529,909 7s. 8d. The marble work of the banquetting hall staircase costs £10,590 0s. 2d., the council-chamber staircase £5,640 8s. 10d., the electric installation £2,209 12s. 8d., the electric and gas light fitting £4,008 7s. 8d., the painting and decorating work £3,750 5s. 3d. The internal finishings of the council-chamber have cost £4,378 8s. 3d., those of the satinwood salon £2,155 6s. 2d., and those of the octagon salon and crush salon £2,554 9s. 4d. The architect's, measurers', and inspectors' fees amount to £26,208 1s. 6d.

The village church of St. Mary, at Dallington, Northants, has received an addition to its reredos in the shape of a sculptured statue of St. James the Great. The reredos was erected when the church was restored in 1883 under Mr. E. Law, of Northampton, and the statue is from a design by the same architect. The figure in question stands upon a Caen stone corbel, and represents St. James the Great. It was executed by Mr. Harry Hems, of Exeter.

On Thursday in last week the marriage took place at St. Paul's, Tupsley, of Mr. G. H. Godsell, architect, of Hereford, and Miss Annie Cheiaka, youngest daughter of Mr. Cheiaka, the late county surveyor for Herefordshire.

On Saturday, the new district church of St. Columba, in the parish of St. Mary's, Gateshead, was opened by the Bishop of Durham. The church, which has sitting accommodation for between 400 and 500, is situated at the corner of Peterbrough-street, Gateshead.

Legal.

THE FINALITY OF ARCHITECTS' CERTIFICATES.

THERE is no doubt that the clause in building contracts as to the finality of architects' certificates has become more and more stringent. But there is a great deal to be said in favour of this stringency, as was very plainly pointed out by Mr. Justice Chitty in the recent case of "Tullis v. Jackson and Others," which no doubt is reported elsewhere in this journal. There the clause provided that the architect's final certificate should be binding notwithstanding any charge of fraud or otherwise. The plaintiffs as contractors claimed more than had been certified, and brought their action against the defendants as building owners. Being met with the plea that the architect's certificate was a condition precedent to their claim, they sought to upset this clause in the contract on the ground that it was void because it amounted to an agreement not to set up a charge of fraud as a ground of defence, and so was contrary to public policy. But there was no fraud charged by the contractors against their employers, the point of their case being that the architect had acted *bonâ fide*, and had certified for a smaller sum than was really due for the purpose of keeping back a larger balance, out of which he could get payment of a sum owing to himself, an allegation that was wholly denied and repudiated by the architect in question.

The principle of the Judge's decision was that there is nothing to prevent parties competent to contract from agreeing with each other that an architect's certificate shall be final and binding in all events and contingencies, so as even to cover charges of fraud. There is no reason why they should not shut out all chances of dispute by declaring that nothing shall be raised against it, and that it shall not be questioned even in a case of fraud. There is no doubt that contractors do sign contracts which to lawyers look terrific, and which seem to place them entirely in the hands of the certifying architect. But then they generally know with whom they are acting, and they rely upon his treating them fairly. Building contracts do raise so many and such complicated questions that, if litigation is to be rendered impossible, this clause must be very stringent and conclusive. It seems now to be established that such a clause can be upheld even though it makes an architect's certificate a bar to a charge of fraud, provided that this fraud is not in the contract itself or in one of the actual parties.

FRED WETHERFIELD, Solicitor.
1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

VERITAS.—ROAD.—PLAN.—If, in fact, the road is not wide enough to comply with the regulations, it would be open to the Local Board to say that the plans were passed under a mistake, and it would be a very difficult thing to force them to take the road over. It is not easy to see any ground of action upon the other point named.

LESSEE.—REPAIRS.—COVENANT.—Even the strong covenant to deliver up premises in "good tenantable repair" must be construed by the light of the facts affecting the property. The Court will therefore consider the age, class, condition, and locality of the house in question, and it is only necessary that the lessee should deliver it up at the end of his term in a fair and tenantable condition, considering the circumstances of the whole case.

LEGAL INTELLIGENCE.

MAIDENHEAD.—An important arbitration case has just been concluded by the publication of the umpire's award. Under section 155 of the Public Health Act, 1875, the Corporation decided to set back the building line of some buildings to be erected by the owner of the land, Mr. A. E. Preece, of Maidenhead. A dispute arising upon the question of the amount of compensation to be paid to Mr. Preece as provided for under this Act, the whole matter was referred by the Local Government Board to Mr. Edward Pritchard, M.Inst.C.E., of London and Birmingham, whose award provides that the Corporation shall pay the sum of £507 to Mr. Preece, as well as the costs incurred in the arbitration proceedings and of the award.

THE BINDING CHARACTER OF ARCHITECTS' CERTIFICATES.—TULLIS v. JACKSON AND OTHERS.—This action, heard in the Chancery Division on Friday, before Mr. Justice Chitty, turned on the point as to the validity of a clause in a building contract making the architect's certificate binding and final, even although attacked on the ground of

fraud. The plaintiffs were the contractors for the greater part of the Free Public Library, Preston, erected out of moneys bequeathed by the late Mr. E. R. Harris, and the defendants were the committee appointed to carry out the scheme. The plaintiffs also joined the architect, Mr. James Hibbert, as co-defendant. The plaintiffs claimed to be entitled to some £56,550 for work done, and had been paid some £53,100. They now claimed payment of the balance—namely, some £3,450, for which sum, however, at the date of the commencement of the action, the architect had not certified. The plaintiff alleged that the architect (as the committee well knew) had not *bonâ fide* certified the amount due to the plaintiffs, but had knowingly certified for a smaller sum than was in fact due to the plaintiffs in order to leave a larger sum available for payment of a sum claimed by the architect. Since the commencement of the action a certificate had been made for about half of the sum claimed. The committee denied that they had the knowledge imputed to them, and pleaded that the architect's certificate was a condition precedent to payment. The plaintiffs at the Bar withdrew *in toto* the charge they had made against the committee. The architect denied and repudiated the plaintiffs' allegation. Mr. Justice Chitty, in giving judgment, said that the trustees were not charged with, and had not been guilty of, any fraud. It was said that the latter part of clause 31, which provided that the architect's certificate was void on the ground of public policy, should not be set aside, or be attempted to be set aside, by reason or on account of any technical or legal defects therein or in the contract, or on account of any informality, omission, or delay, or error in or under the proceedings, or any of them, or in relation thereto, or on any other ground, or for any other reason, "or for any pretence, suggestion, charge, or insinuation of fraud, collusion, or confederacy." It was said that clause 31 was void as being against public policy, because it was in substance an agreement on the part of the defendants not to set up fraud. To some portions of this argument he acceded. If a contract was obtained by fraud, and in the contract itself there was the term inserted that neither party should impeach the contract on the ground of fraud, it might be that such a term would not stand, and the reason was obvious. But the actual case he had to deal with appeared to him to be an entirely different one. Those who had been in the habit of framing clauses of the kind now in question had kept on making such clauses more and more stiff with a view to avoid the consequences of having the certificate opened. Amongst such consequences were the enormous cost and litigation which must arise from any Court of justice endeavouring to take the account—an account of thousands and thousands of items, on every one of which the skilful advisers might raise some definite issue whether the amount should stand for the sum charged or for some less or greater sum. Those who dealt with contracts like the present were, therefore, wise in making the clauses in the respect referred to more and more stringent. It was for the contractor when he entered into a contract of this kind to consider whether he would accept it or not. Contractors, no doubt, did accept clauses which to a lawyer looked terrific; but they did it as business men—they did it for better or worse—and because they thought, on the whole, it was more likely than not that it would work out rightly, and that the architect or surveyor whose certificate they were content to take as final would act justly towards them. The policy of the law did not require that he should hold in this case that a clause like the present was void. To put an illustration. Say a gentleman, who was going to have a house built for him, said to the contractor:—"On this complex contract innumerable questions may arise in its performance; will you agree with me (for if you will agree with me, I will agree with you) that nothing on earth shall upset the certificate that is given?" Why was that unfair? He could see no reason why grown up men should not be allowed to contract in those terms. It was well known that persons would shrink very often from charges of fraud, and that those who were persistent would merely, by bringing charges, induce persons to come to terms of compromise. The clause in question was addressed to get rid of what the parties might consider evils. The clause, therefore, stood thus. The parties said in effect—"Both of us agree to the advantage or disadvantage of the arrangement; we both of us agree that every certificate given by the gentleman named shall stand firm and good, and shall not be questioned even for fraud." That that was the meaning of the clause he had no doubt. It had been argued that the word "charge" in the clause meant "unfounded charge." He could not accept that. To put in the clause "unfounded charge of fraud" was almost to put in nonsense. Protection against that which was unfounded, and, therefore, must fail, was not required. The sum of his judgment was that the parties meant what they had said, and that the term "charge" as used here was used deliberately, the parties saying: "We will have no question of this kind raised as against the certificate." It need

hardly be said that if the case had been that the committee themselves had been parties in any way to the fraud, the legal position would have been very different. The plaintiffs' action against the committee was not justified, and it was dismissed with costs. Nothing was claimed by the plaintiffs from the architect who was joined as defendant. The plaintiffs' allegation against him was inserted merely for the purpose of founding the relief claimed against the trustees. The case had been so shaped that the Court could not even enter upon the allegation as between the plaintiffs and him. The plaintiffs' action as against him was also dismissed with costs.

CENSURE ON A LOCAL AUTHORITY.—CUNLIFFE v. THE HAMPTON WICK LOCAL BOARD.—Mr. Ridley, Q.C., the referee before whom this action was tried, gave his judgment on Friday in last week on the claim made by the plaintiff, Mr. W. Cunliffe, the contractor for the sewerage works, and the counter claim made by the Hampton Wick local board. The official referees said the claim was for balance of an account certified for by the surveyor to the local board for Hampton Wick, and the defence generally was a counter-claim. Before going into the history of the case, he wished to state what his views were on the contract. It had been contended by defendants' counsel that the work was to be done to the satisfaction of the surveyor and consulting engineer. He read the contract, however, as meaning that the surveyor was the person controlling the final certificate, and he did not think either the contract or the specification intended to say that the approval of the consulting engineer as well as the surveyor was required in order to enable the contractor to recover. The claim of £637 13s. 7d. was reduced by the allowance of £10 odd and £5 10s., with respect to a railway arch, to £622 2s. 9d. subject to the counter-claim. He thought there was no defence to that except such as arose on the counter-claim. The certificate gave him a right to recover, final and absolute, subject to his liability under Section II., and if the local board could show that the contractor was liable under that clause they were entitled to recover on the counter-claim. Having reviewed the evidence, the official referee said he could not understand the position of the board on receipt of their surveyor's certificate as to the completion of the work. They had no right to treat that as a report and not as a certificate, and they had no right to refer the matter to the final decision of the consulting engineer. What right had anyone to suggest to the surveyor that he should withhold the certificate? Mr. Elsam had done his duty, and there was not a tittle of evidence to show that he had not done his duty and gone through every part of the work. On the 28th April Mr. Elsam's appointment was revoked. There was no allegation that he had neglected his duty, or that he was incompetent to fill the office, and it seemed to him that Mr. Elsam was dismissed because he signed that certificate. He did not see how anyone could come to any other conclusion, and if that was so it was a most improper thing to do, because it was done in order to set up a defence to the claim. It was stated that Mr. Elsam was discharged before the date of the certificate, but the certificate was given on the 6th April, and the appointment was revoked on the 28th. He was asked to withhold his certificate, and go into the matter, but he was dismissed before he had time to do so. That was not an example to be followed by anybody who wished to be fair and impartial. If there was any negligence or improper conduct, there was no foundation for what he said, but it appeared that the board had been guilty of a piece of injustice. With regard to the alleged defects, he should find that in neither case did they appear within the three months. He thought there was improper workmanship and materials in Vicarage-road, and he thought, as the contractor said, that the surveyor saw and passed it. With reference to Hampton Court-road, he thought the allegations were not proved. The result would be judgment for the plaintiff, Mr. Cunliffe, on the claim and on the counter-claim, which had not been made out. He also gave interest of four per cent. on the amount claimed from the date of the certificate. Costs for the plaintiff, Mr. Cunliffe, on both cases.

IS A MODEL WINDMILL A SKY SIGN?—THE LONDON COUNTY COUNCIL v. CARWARDINE.—This appeal was heard in the Queen's Bench Division by Justices Wright and Collins on Monday, the 11th inst. It was an appeal from a decision of Mr. Rose, a Metropolitan magistrate, and the question involved was the construction to be placed upon the Sky Signs Act. The defendants carried on business in the City-road, and had upon their premises a tower 50ft. high, a windmill, which ground meal, carried sacks of meal, and worked a dynamo. There was also upon the structure a trade inscription. The defendants were summoned for having a sky sign without the permission of the Council. The magistrate held that the structure was a windmill, and not a sky sign. We fully reported the case in our issue of March 18 last (p. 423, last volume). The Court, after some argument, said this decision was upon a question of fact only, and gave no ground of appeal; and they sent the case back to

him to state if there was really any question of law which he wished to raise for that Court.

IN RE C. S. WHITTINGHAM.—This debtor, Christopher Samuel Whittingham, of Daventry, contractor, came up for public examination last week at the Northampton County Court. His total liability was estimated at £2,040 8s. 8d., of which £1,870 8s. 8d. was due to unsecured creditors. The net assets were estimated at £726, leaving a deficiency of £1,143 8s. 8d. The debtor had made an offer of 7s. 6d. in the pound, which had been accepted by the creditors. The debtor was examined as to a contract with the Daventry Corporation, and the examination was closed.

LIABILITY FOR DESIGNS.—MAINZER AND KEMP-THORNE v. ELLIOTT AND CO.—On Thursday week this action was tried in the Manchester County-court. It appeared that Messrs. Elliott and Co. (Mr. Jacques trading as such), wrote the plaintiffs desiring that they should see him in Manchester with reference to the preparation of designs for marble mosaic pavements for the Palace of Varieties, Manchester. The plaintiffs called upon the defendant accordingly, and with his manager saw the architect. They told the defendant's manager that if they obtained the order they should require to be secured as to payment, and as the defendant informed plaintiffs that there would not be any difficulty on this score, they proceeded with the preparation of designs at his request. These, it is alleged, were submitted by defendant to the architect, and approved, and at this time defendant would not consent to giving security; but had the designs executed by another firm. The plaintiffs accordingly sued for cost of preparing designs, and expenses, and recovered £10 10s., and costs.

CROSS ACTIONS AS TO SEWAGE DISPOSAL.—HANWELL LOCAL BOARD v. WENHAM.—On Tuesday week an action was commenced in the Chancery Division before Mr. Justice Romer, in which the Hanwell Local Board sought to obtain an injunction against Mr. Augustus Wenham to restrain him from continuing the connection of a ditch on his land with the effluent pipe from the sewage works, which discharges into the river Brent; and also for an order restraining him from making any further connection with the pipe. In a counter-claim, Mr. Wenham sought to obtain from the local board compensation for injury to the crops on his farm, caused by the board's sewage percolating to his land, together with an injunction restraining the board from continuing the damage. The evidence adduced in the first case showed that notice was served on Mr. Wenham by the board to disconnect a pipe on his land adjoining the board's sewage farm with the Board's effluent pipe. He wrote to Mr. James, the clerk, that he had communicated with his landlord. Subsequently he disconnected the pipe under the direction of the board's surveyor, but this fact, through some misunderstanding, did not come to the knowledge of the clerk till after the issue of the writ. During the hearing of the defendant's case Mr. Justice Romer intimated that he did not desire to hear any more. Mr. Wenham had not proved to his satisfaction that he had sustained any damage. He had, however, given him a chance to prove his case by the cross-examination of witnesses on the other side, but the result was to make his case worse than before. Judgment would be for the board, with costs.

EMPLOYERS' LIABILITY ACT.—AN UNSATISFACTORY VERDICT SUSTAINED.—WOOTEN v. BENNETT.—In this appeal case heard in the Queen's Bench Division on May 11, before Justices Wright and Collins, the plaintiff was the widow of a plasterer who had been in the employment of the defendant, and was killed by the fall of a scaffold 9ft. high whilst pointing a cottage. The plaintiff sued in the Bradford County-court under the Employers' Liability Act for compensation for the loss of her husband, and recovered a verdict for £270. Mr. Kershaw, for the defendant, now moved that there should be judgment for the defendant, or a new trial. He said the scaffold consisted of a plank, one end of which rested upon a padlock, and the other upon a triangle which was suspended from a ladder. One of the uprights of the ladder had been broken and had afterwards been bound up. This ladder gave way and caused the accident. The scaffold was erected by the deceased, and he must have seen that the ladder was defective. It was now submitted that the only duty upon the employer was that he should keep proper material, which the defendant did, and that the duty upon the servant was to select proper material. Mr. Banks, for the plaintiff, argued that there was some evidence of negligence on the part of the defendant. Mr. Justice Wright said he could not but think the verdict unsatisfactory; but that was no ground for the interference of the Court. He thought there was some evidence that it was owing to the negligence of the defendant that the defect in the scaffold had not been remedied. The application was dismissed with costs.

Sir William Arroll, the Forth Bridge contractor, has failed by 197 votes to retain the seat in South Ayrshire for the Unionists.

WATER SUPPLY AND SANITARY MATTERS.

BOLTON.—For some time there has been a dispute between the Bolton Corporation and the Bolton Rural Sanitary Authority as to the alleged pollution of an extensive reservoir at Heaton, belonging to the corporation, and Colonel Hasted, R.E., held an inquiry on the subject on the 13th inst. Great interest was taken in the matter, as a large population is affected by the outcome of the investigation. The town clerk, Mr. R. G. Hinnell, said the Heaton Waterworks cost £68,000, and a large sum had been expended in improvements to get a better and purer supply. The reservoir was situated in the rural sanitary authority's district, and owing to the locality not being sufficiently sewered decayed vegetable matter and sewage from cottages and farms got into the reserve and made the water unfit for use. In consequence of the water being declared bad by the borough medical officer, 69 million gallons had been run to waste at one time. Outside districts supplied by the corporation complained of the quality of the water, and refused to pay their accounts. This was a very serious matter.—Mr. Simpson Cooper, clerk to the rural sanitary authority, said they had a prescriptive right to turn the sewage on the land, and it was also used for irrigation purposes by the farmers. It was not for the authority to lay the sewers as requested, but they relied on the visit of the inspector to the place to settle the matter.—A number of witnesses were called by both sides, and the inquiry was an exhaustive one.

CROMER.—The local waterworks company have for the past two years been sinking a second well about half a mile away from the town. The new well varies from 8ft. to 5ft. in diameter, and has been carried to a depth of 183ft. from the surface. The chalk was reached at a depth of 138ft. below the surface, and the well has been lined to a depth of 151ft. with brickwork and iron cylinders. The new borehole, which is 20in. in diameter, extends from the bottom of the well for a further depth of 40ft. The two headings, each 6ft. by 4ft., have been driven a distance of 100ft., one connecting the new well and the old borehole by means of which the town has hitherto been supplied. The well, with the headings, possesses a storage capacity of 25,000 gallons, and the total yield will be 200,000 gallons a day. A new set of pumps and engine has been erected, designed to lift 12,000 gallons per hour, and the system is now in duplicate. The water has been favourably reported on by Professor Frankland, F.R.S. The works have been carried out in the direction of Mr. J. C. Mellis, M.Inst.C.E., of London, and of Messrs. Thomas Tilley and Sons, of Walbrook, E.C. The pumps and machinery are by Messrs. Robert Warner and Sons, of Walton-on-the-Naze, while the buildings on the surface have been erected by Mr. John Newman, of Cromer.

LIVERPOOL.—The new Vyrnwy water supply to the city, carried out under the direction of Mr. G. F. Deacon, was formally inaugurated by the Duke of Connaught yesterday (Thursday). An accident which will involve much trouble and expense unfortunately took place on the works at Fiddler's Ferry, at the aqueduct crossing under the Mersey. A valve in a 24in. temporary main gave way, and the 12in. temporary pipe by which the city has hitherto been supplied, also burst. The new 42in. main is, however, intact.

A memorial has just been placed in the Toller Chapel at Kettering, to commemorate the late William Toller, for 64 years a teacher in the Sunday-school, and for 49 years a deacon of the chapel. It was executed in variegated alabaster with gilded lettering. Messrs. Harry Hems and Sons, of Exeter, have carried out the work.

On Saturday the Lord Provost of Aberdeen opened a granite bridge which has been erected across the Don at Persley, half-way between the industrial villages of Buxburn and Woodside. The bridge is of five spans, the three centre ones measuring 50ft. in width, and those which rest on the bank at each side 25ft.; the breadth is 32ft. and the approaches 20ft. Mr. P. M. Barnett, C.E., was the designer of the structure, the contractor being Mr. James Leith, Aberdeen.

An inquiry into the application by the Corporation of Luton for power to borrow money to carry out proposed alterations to the Waller-street Plait Hall was held on Wednesday week by Major-General C. Phipps Carey, one of the inspectors of the Local Government Board. To cover the expense of converting the hall, £3,700 is to be borrowed, and £550 additional for covering in the yard adjoining with the iron roof to be removed from the building itself. Mr. Roscoe, borough surveyor, and Mr. Cox, of Messrs. Cox and Marmon, of Liverpool, the architects whose plans have been accepted, exhibited and explained the designs, it being stated that for the alterations to the hall the tender of Mr. G. Smart had been accepted at £3,150.

Our Office Table.

At Tuesday's meeting of the London County Council, an important scheme for providing access to the southern end of the Tower Bridge was presented. The committee have experienced great difficulty in the preparation of a satisfactory scheme for this improvement, owing to the difficulty of striking a direct line. The Church of St. Mary Magdalen, a disused burial-ground now laid out as a recreation-ground, and extensive buildings, factories, and works lie in the track. They now propose to cut a street 60ft. wide from Tooley-street to the south-western end of the Bermondsey New Road, and so forming a new communication with the Old and the New Kent Roads. The cost of the improvement is set down at £423,000. The report will be considered at the next meeting of the County Council, on Tuesday.

The London County Council, at their meeting on Tuesday, also instructed the Building Act Committee to consider and report on the expediency and practicability of obtaining such an amendment of the Metropolitan Building Acts as to bring the railway stations in London and other exempted structures within the provisions of those Acts and the Metropolitan Management Acts. The Public Health Committee was authorised to attend a Local Government Board inquiry about to be held to investigate the proposed improvements at Moira-place and Plumbers'-place, Shoreditch, about to be dealt with as insanitary areas. A number of houses in the neighbourhood will be taken under the Artisans' Dwellings Acts, 1868 and 1882. The result of the arbitration appointed by the Home Secretary has been the decision that the Council has to pay one-half of the cost of dealing with the area.

In the proposed route from Holborn to the Strand recommended by the Improvements Committee of the L.C.C., a large central circus is to be made about half-way, at the junction of Kemble-street with the south side of Lincoln's Inn Fields, communicating with many important thoroughfares. White Hart-street and Black-moor-street will be widened, and form another westward spur, coming out in Catherine-street, opposite the side of the Gaiety Theatre. These widenings and the Strand terrace will create important frontages and architectural opportunities if no parsimonious spirit is allowed to enter. It is a pity Southampton-row could not be widened to take in Kingsgate-street and the block of intervening houses, so that the communication northwards may be extended at least as far as Theobald's-road.

Old Raleigh House, on Brixton Hill, is now so built round by new brick houses of the "jerry builder" style, that it cannot any longer be seen from the main road. Those who knew the old house surrounded by its ancestral trees will be surprised at the transformation. We are sorry to see that a very ordinary type of villa has been adopted for the main front facing the road. Red brick and tile roofs would have been infinitely more appropriate for the surroundings than white brick and slated roofs. An architectural character at least might have been given to the front row of detached villas.

A SERIES of eighteen portraits of the Cockburn, Lyttelton, and Hamilton families has just been added to the National Gallery under the bequest of Marianne Augusta, Lady Hamilton, and of these the most noteworthy is Lady Cockburn and her children, by Sir Joshua Reynolds, exhibited at the Academy in 1774 and engraved in 1793 under the title of "Cornelia and her Children" by C. Wilkins. The children were James, George, and William Cockburn, who succeeded in turn to the baronetcy as sixth, seventh, and eighth holders of the title. There are three other portraits of Sir James Cockburn, nby A. W. Devis, Zoffany, and by an unknown artist, and one of Admiral Sir George Cockburn, by J. J. Halls, among those just bequeathed to the Gallery. The collection is hung in rooms XVI., XVII., XVIII., and XIX., and the numbers range from 1,354 to 1,372.

UNDER the revised rules for the professional examinations of the Surveyors' Institution, all applications from candidates for the Professional Associateship or the Fellowship Examinations must reach the secretary of the Institution

before the end of the preceding month of October, instead of the end of the preceding month of November as under the old rules. It is also announced that the Division V. Examination of the Institution, which has been suspended for some years past, is now revived in a greatly modified form. Those whose qualifications fall within the conditions of entry for this Examination can, by means of it, qualify directly for the Fellowship of the Institution without passing a previous examination. A Direct Fellowship Examination will be held in March next contemporaneously with the other professional examinations.

THE most important public building destroyed by the disastrous fire which has laid the greater part of the city of St. John's, Newfoundland, in ruins is the Episcopal Cathedral, a building which has been some five-and-forty years in course of erection in sections. The original designs were prepared in 1847 by the late Sir Gilbert Scott, and the nave was then erected. For many years nothing further was attempted, but in 1880 Mr. Gilbert Scott was intrusted with the completion of his father's designs, with such modifications as he might judge desirable, and the choir and transepts were built by a body of masons sent out from England, the whole of the freestone being exported from the Giffnock Quarries, near Glasgow, although a local sandstone quarried near St. John's was utilised for the rubble walling. Before last Friday's fire the cathedral consisted of a nave with aisles of six bays, lighted by a single lancet-headed window in each bay of the aisle and clerestory, and a western narthex; projecting transepts, and a square-ended choir of four bays, this eastern work being of fully developed Decorated character, and provision was made for a future central tower 35ft. square, with broach spire. The styles were purely worked out, the whole effect was simple and bold, and general regret will be felt that so fine and substantial an example of a colonial building designed by English architects should have fallen a prey to the flames. Illustrations of the cathedral appeared in our issues of September 18 and October 30, 1885.

A ST. LOUIS man has recently invented a kiln for seasoning wood, which is a radical departure from the ordinary high temperature devices of the kind, the air at no time being higher than 100° F. With such a temperature, and a rapid circulation of air, it is claimed that green wood can be perfectly and rapidly seasoned, since the conditions are the same as those under which lumber is dried in the open air in summer. The kiln is built in separate compartments, with a heating coil under each which raises the temperature from 65° to 100°, the warmed air escaping from one end of the kiln through suitable openings. From the opposite end of the compartment the air is drawn out by a powerful fan. As provisions are made to prevent its passing over the pile, the air goes through the spaces left between the boards, and hence comes in contact with every part of the lumber. It is said that the wood rapidly matures under these conditions.

THE regulations of the examinations for sanitary inspectors, about to be held by the British Institute of Public Health, have just been issued. Two examinations, a preliminary and a technical, will take place each year in April and October. The preliminary examination will be on subjects of general education, and must be passed before the candidate can be admitted to the second or technical examination, unless satisfactory evidence be produced to the council of the candidate having passed an equivalent examination. The technical examination will be in so much of sanitary science as is comprised in the functions of a sanitary inspector, and will be written, oral, and practical. A candidate will be admitted to this examination on producing evidence (1) of being twenty-one years of age; (2) of having passed the preliminary or an equivalent examination; (3) of having received practical instruction in the subjects of the examination, of such a character as shall be deemed sufficient by the council, or of having held for at least one year the position of a sanitary inspector. Every candidate who has passed the technical examination to the satisfaction of the examiners will receive a certificate testifying to his knowledge of what is required for the duties of a sanitary inspector. The fee for the examinations is three guineas. Candidates intending to present themselves for either

examination must give fourteen days' notice in writing on forms, to be obtained on application to the secretary of the Institute, King's College, London. The examinations will be held on the first Wednesday, Thursday, and Friday in the months of April and October in each year. The next preliminary examination will be held in London on October 5th, and the technical examination on October 6th and 7th, 1892.

Trade News.

WAGES MOVEMENTS.

BRISTOL.—According to the *Bath Herald*, work is so brisk in Bristol with the building trade that there is a great demand for masons at 8d. per hour, and men are readily finding employment.

BOLTON.—The whole of the operatives in the Bolton and district building trade were locked out on Saturday in pursuance of a resolution passed by the Masters' Federation. The trouble has arisen through the plumbers and glaziers, who have been on strike for ten weeks, refusing to accept arbitration as a means of settling the dispute. Over 1,000 skilled workmen are affected.

CARDIFF.—Stonemasons, bricklayers, and labourers held a meeting at Cardiff on Monday, when it was resolved not to accept the offer of the master builders to resume work at 8½d. per hour. The masters have taken steps to bring in men from other places, and have given notice of their intention to the officials of several trade unions on strike.

NORTHAMPTON.—The strike among the bricklayers shows no signs of ending, and is involving the stoppage of the other building trades in the town.

CHIPS.

The ventilation of Glencue Academy is all being carried out by Messrs. Baird, Thompson, and Co., of London and Glasgow.

A new public hall has been erected at Harrow-road, W., and special attention has been paid to the ventilation, which is carried out on the Boyle system.

The Dover Harbour Board on Saturday accepted the tenders of Mr. John Jackson, of Victoria-street, Westminster, for upwards of £400,000 for the eastern arm of the new harbour at Dover. The work is to be commenced forthwith.

The Bishop of Chester, on Thursday last week, reopened the village church of Marbury, near Whitchurch, which has undergone restoration at a cost of £2,300. Messrs. Douglas and Fordham, of Chester, were the architects, and Mr. John Stringer, of Sandbach, was the contractor.

The new municipal buildings with which the citizens of Gloucester have provided themselves, and which will be known as the Guildhall, were formally opened on Tuesday. It was in 1887 decided to acquire the site of Sir Thomas Rich's School in Eastgate-street for the present building; but it was not until 1899 that Mr. G. H. Hunt, of London, was appointed architect, and Messrs. Bowers and Co., of Hereford, the builders. The selected design for the building, which, with site, has cost nearly £35,000, was illustrated in the *BUILDING NEWS* for July 26, 1889.

Foundation stones of a Wesleyan chapel were laid on Wednesday week at Church Fenton. The building, which is to be constructed from the plans of Mr. F. W. Dixon, architect, Oldham, is to cost about £1,150. It comprises a chapel, with accommodation for 200 persons; and a schoolroom for 140 scholars, which can, when requisite, be made into one. In addition, there will be two classrooms and vestry. The chief contractors are—masons' work, Messrs. Thompson and Son, Sherburn and Leeds; and joiners' work, Messrs. Atkinson and Sons, Leeds.

A stone reredos has just been erected in St. James's church, Higher Broughton, Manchester, in memory of the late Dr. Theodore Drayton Grimké. The side and east walls of the chancel have also been decorated in oil, the design being the Rose of Sharon, treated conventionally by Mr. R. Bennett, of South King-street, Manchester. The reredos has been executed by Messrs. Earp and Hobbs, of Lower Mosley-street, in that city, from the designs and under the superintendence of Mr. R. Price, also of Manchester. The reredos was unveiled on Sunday last.

On page 58 of our issue for July 8th, 1892, in a notice of the dedication of the restored belfry, new bells, and rood-screen at St. Peter's Church, Bexhill-on-Sea, the name of the architect appears as Mr. Thomas Parratt. It should have been Mr. Thos. Garratt, and we are informed that the chancel screen is the work for which that gentleman is responsible. Other fittings from his designs are now in hand.

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TENDERS.

Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

BARNET.—For alterations and additions to Barnet Town Hall. **Mr. J. White, Barnet, architect:—**

Marriott ...	£350 0 0
Anstew ...	326 0 0
Hughes ...	297 0 0
Houghton and Son ...	293 0 0
Allen and Son ...	218 0 0

BARNSELY.—For street-making, for the town council. Accepted tenders:—

Cresswell-street:—	
Hood, J. ...	£715 0 0
James-street:—	
Higham and Porter ...	498 13 0
Upper Sykes-street:—	
Burrows, H. ...	189 15 0
Victoria-street:—	
Taylor, J. C. T. ...	287 0 0
Upper Silver-street:—	
Bycraft, E. ...	450 0 0

BARRY, NEAR CARDIFF.—For the erection of five villas and two cottages, Porthkerry-road, Barry. **Mr. W. H. Watling, Council Chambers, Newport, and Cardiff, architect:—**

Jenkins and Arnold, Barry (accepted) ... £2,865

BARRY, NEAR CARDIFF.—For the erection of three shops at Barry Dock road, Barry. **Mr. W. H. Watling, Council Chambers, Newport, and Cardiff, architect:—**

Jenkins and Arnold, Barry (accepted) £2,908

BECCLES.—For building new granary warehouse and engine-room for Mr. H. L. Robins, coal merchant. The bricks found by proprietor. **Mr. Arthur Pells, F.S.I., surveyor:—**

Allen, F. J. ...	£390 5 0
Hindes, E. W. ...	304 0 0
Calver ...	290 0 0
Dunn ...	275 10 0

All of Beccles.

BERMONDSEY.—For the erection of a dispensary in Abbey-street, Bermondsey, for the guardians of the poor of the St. Olave's Union. Messrs. Newman and Newman, 31, Tooley-street, London Bridge, architects. Quantities by Mr. W. T. Farthing:—

Bentley, J. ...	£2,837 0
Coxhead, M. ...	2,677 0 0
Castle, W. and H. ...	2,639 0 0
Kellett, A. ...	2,676 0 0
Bullers, J. ...	2,585 0 0
Wells, W. ...	2,583 0 0
Faulkner, H. ...	2,498 0 0
Richardson, J. O. ...	2,460 0 0
Hall, T. ...	2,358 13 0
Cousell Bros. ...	2,342 0 0
Balaam Bros. (accepted) ...	2,279 0 0

BRIGHTON.—For erection of public elementary schools at Stanford-road, Brighton, for the Brighton and Preston School Board, U.D. **Mr. Thomas Simpson, 16, Ship-street, Brighton, and Mr. John W. Simpson, 10, New Inn, Strand, W.C., joint architects:—**

Mid-Kent Building Co. ...	£14,310 0 0
Freeman, V. P., Brighton ...	13,990 0 0
Holloway Bros. ...	13,814 0 0
Kilby and Gayford ...	13,781 0 0
King ...	13,695 0 0
Peters, Horsham ...	13,605 0 0
Johnson and Co. ...	13,532 0 0
Simpson and Co. ...	13,378 0 0
Chappell ...	13,132 0 0
Taylor, Brighton ...	13,023 0 0
Longley and Co., Crawley ...	12,541 0 0
Taylor Bros., Hastings (accepted) ...	12,207 10 10
(Rest of London.)	

BRISTOL.—For the construction of boundary walls and the fixing of iron railings at the public park:—

Wilkins, G. H., Bristol (accepted) £1,341 14 5

BURGH-HEATH.—For the erection of two blocks of four cottages each at Burgh-Heath, near Epsom, Surrey, for Mr. Charles Beall. **Mr. F. J. Dibble, Docking, architect:—**

Wells, W. J., Kingswood, Reigate ...	£1,692 0 0
Potter, J. B., Sutton ...	1,400 0 0
Peters, R., Banstead (accepted) ...	1,317 10 0

CARDIFF.—For converting three houses, Nos. 210, 212, and 214, Cowbridge-road, Cardiff, in shops and dwelling houses, for the Newport Property Investment Co. **Mr. W. H. Watling, Council Chambers, Newport, and at Cardiff, architect:—**

Hopkins, J., Cardiff ...	£83 0 0
Lock, C., Newport ...	180 0 0
Richards, E. ...	179 0 0
Price, W. ...	185 0 0
Ashley, E. W., Cowbridge-road, Cardiff (accepted) ...	159 0 0

CHICHESTER.—For the erection of a police station at Chichester, for the Receiver for the Metropolitan Police District. **Mr. John Butler, F.R.I.B.A., architect. Quantities by Mr. W. H. Thurgood:—**

Graham and Co. ...	£3,993 0 0
Naylor and Son ...	3,887 0 0
Calland ...	3,848 0 0
Wallis ...	3,740 0 0
Higgs and Hill ...	3,684 0 0
Chappel ...	3,677 0 0
Grover ...	3,657 0 0
Gardener ...	3,650 0 0
Hart Bros. ...	3,645 0 0
Knight ...	3,629 0 0
Lathey Bros. ...	3,540 0 0
Avard ...	3,500 0 0
Wiltshire, jun. ...	3,494 0 0

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LIVERPOOL:

GLASGOW:

352 TO 362, EUSTON ROAD

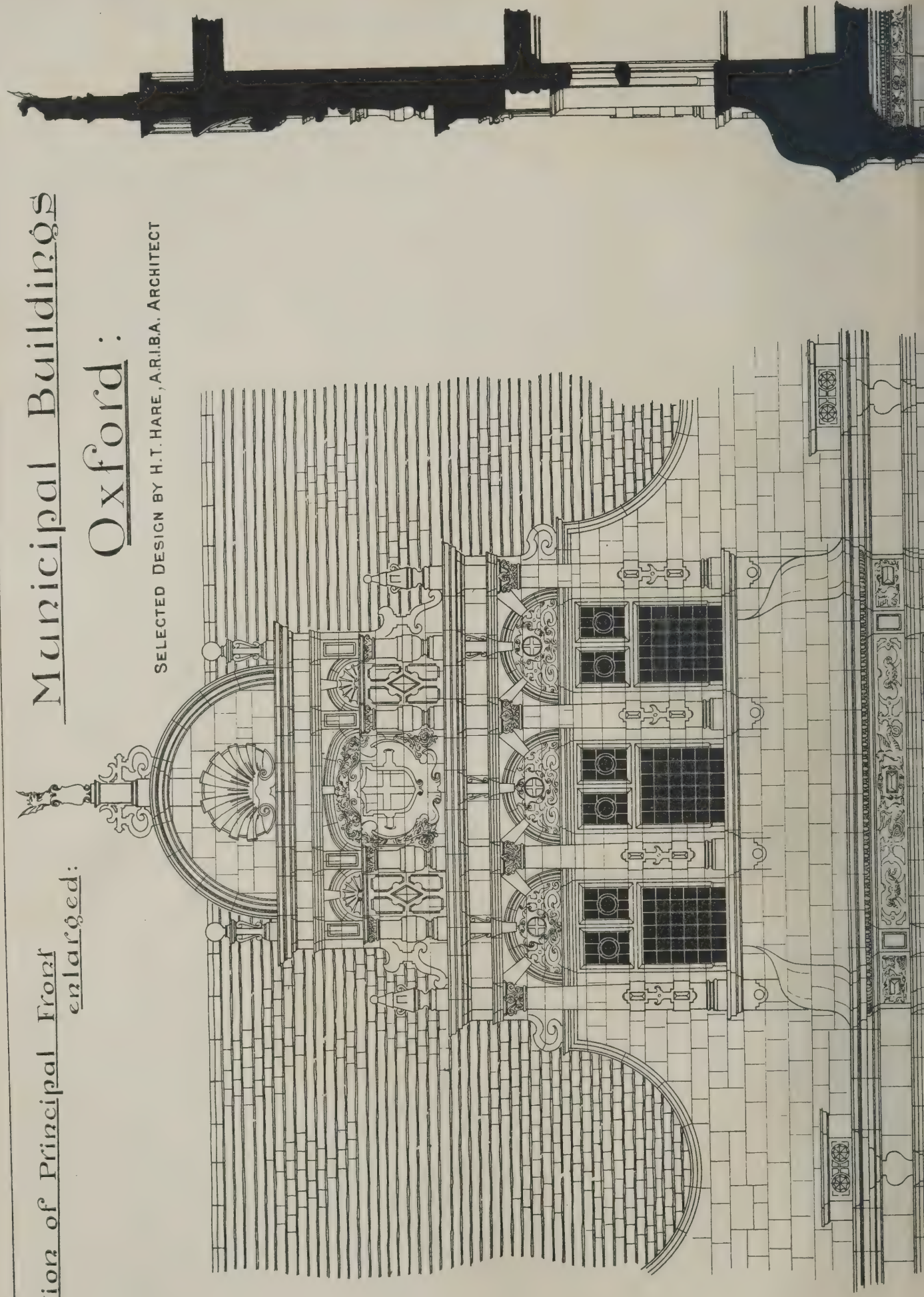
6 & 8, HATTON GARDEN.

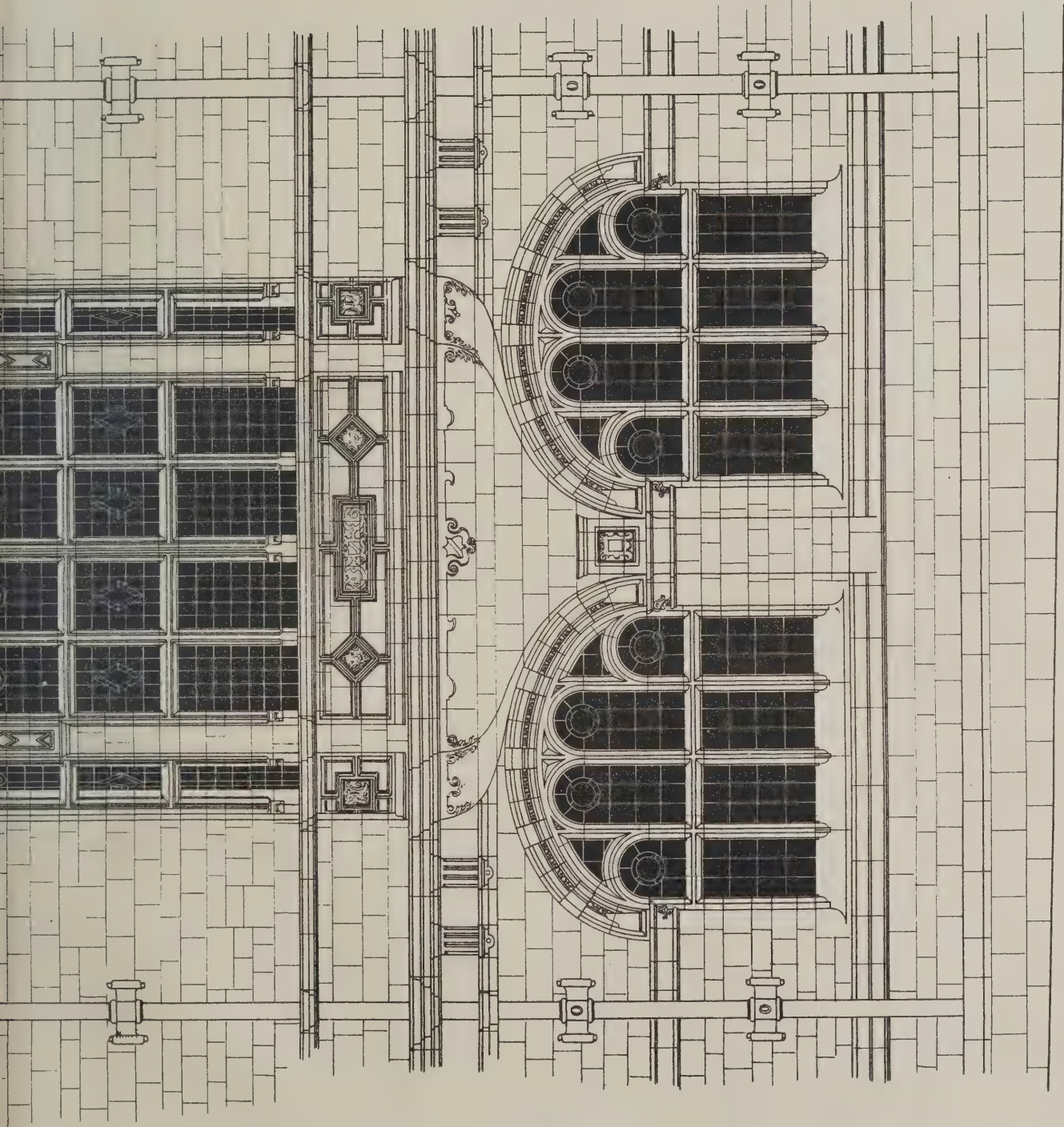
47 & 49, ST. ENOCH SQUARE.

Portion of Principal Front
enlarged:

Municipal Buildings Oxford:

SELECTED DESIGN BY H.T. HARE, A.R.I.B.A. ARCHITECT





Scale of Feet:
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

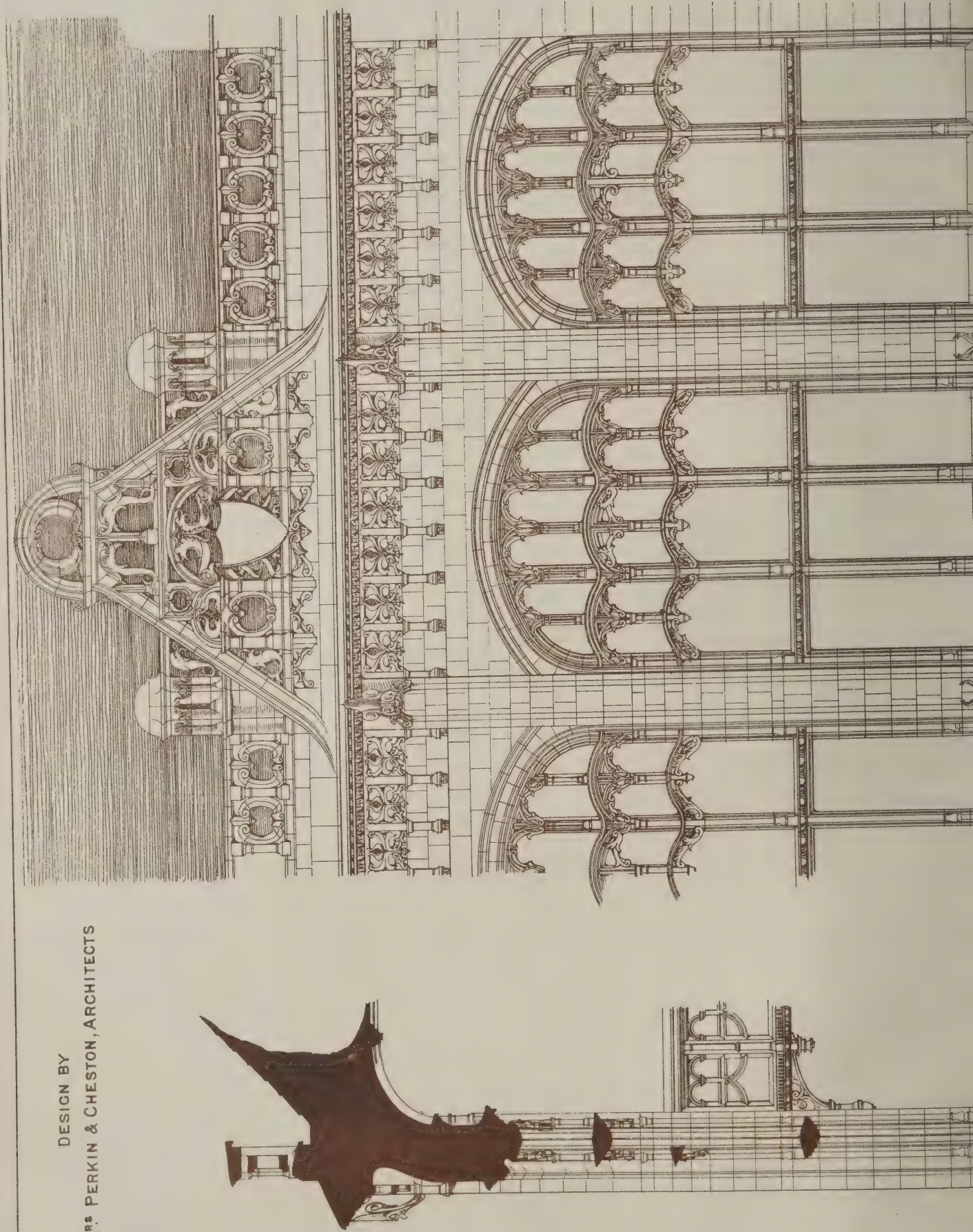


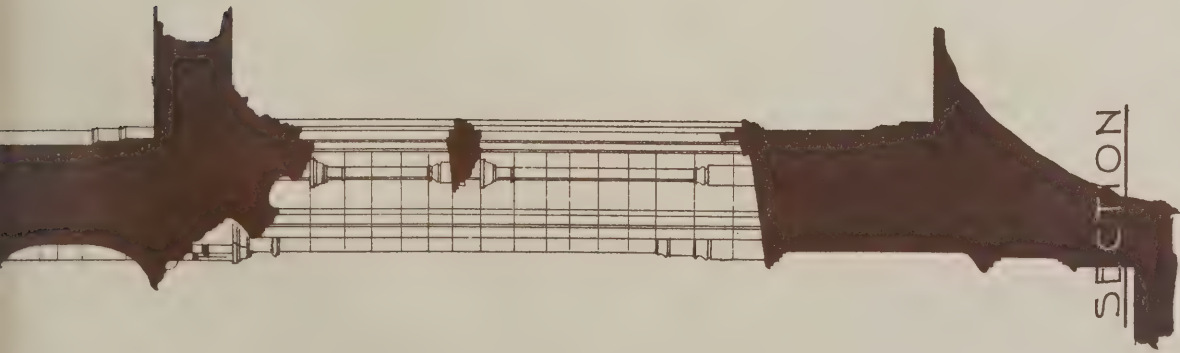
Elevation:

Section:

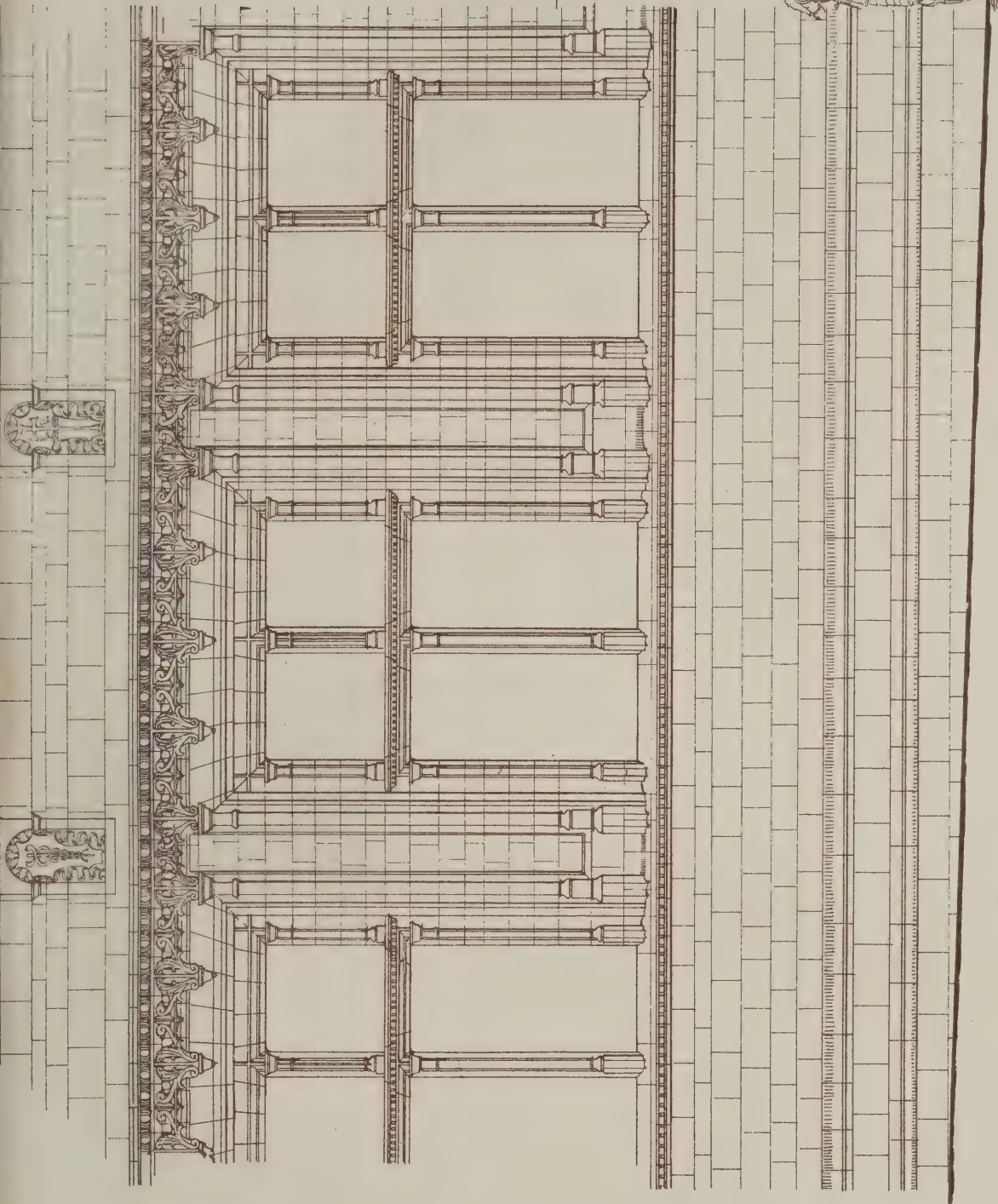
DESIGN BY
MESS^{RS} PERKIN & CHESTON, ARCHITECTS

THE BUILDING NEWS, JULY 15, 1892.





SECTION



GROUND FLOOR PLAN



FIRST FLOOR PLAN

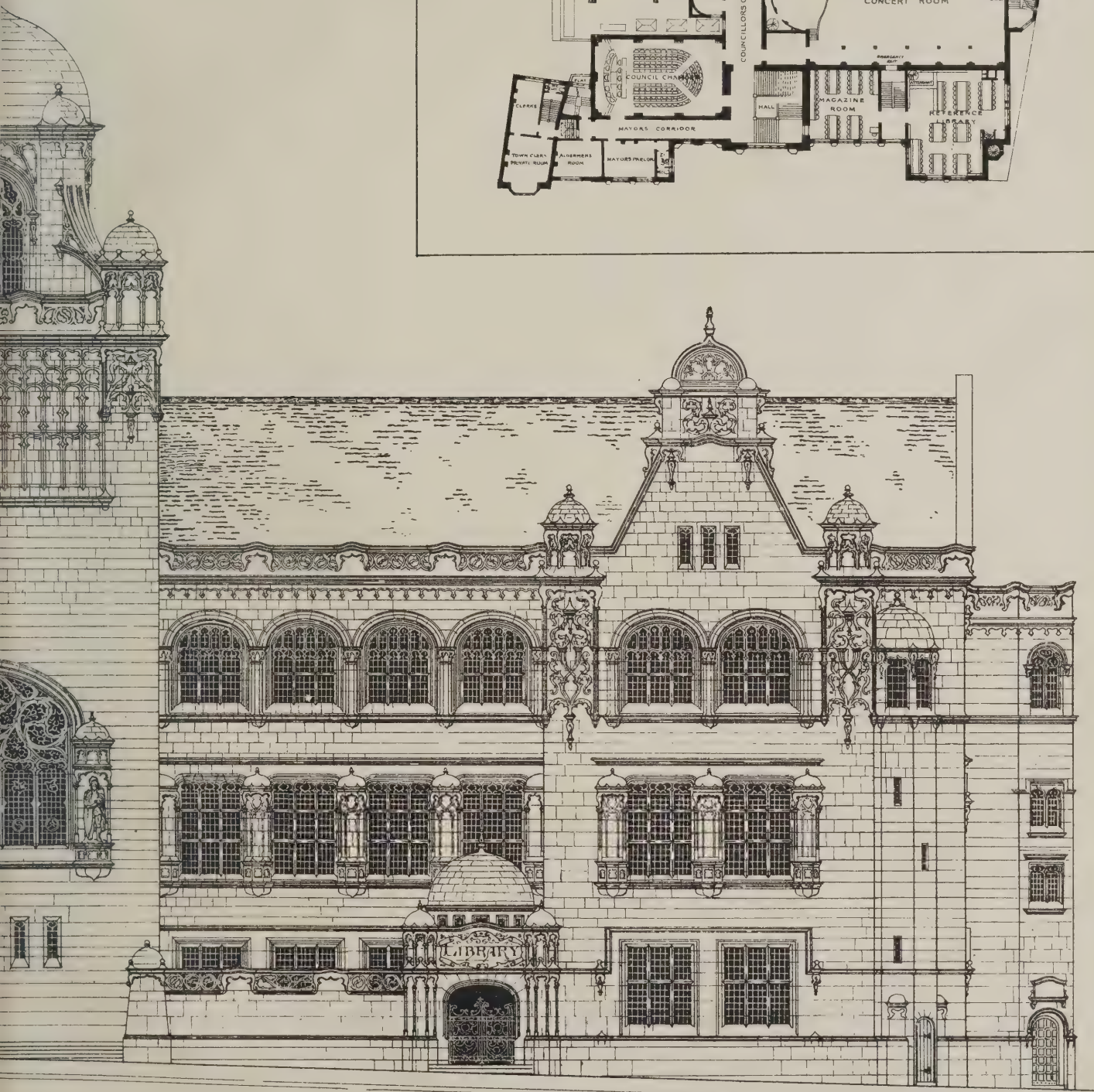
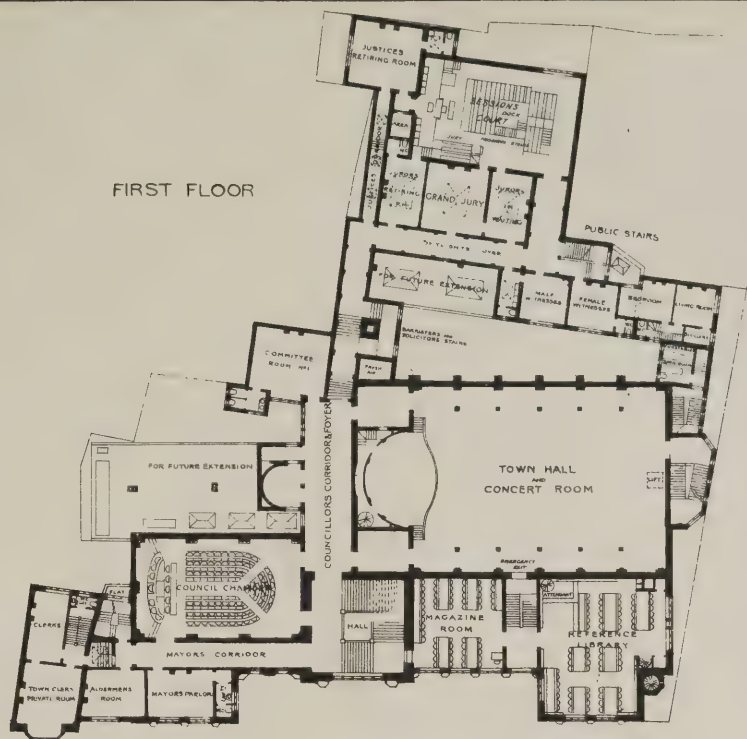
Municipal · Buildings · Oxford ·

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Buildings · ford ·

T RUNTZ, ARCHITECT.

FIRST FLOOR



ALDATE'S STREET

7° 8° 2° 1° 15° feet

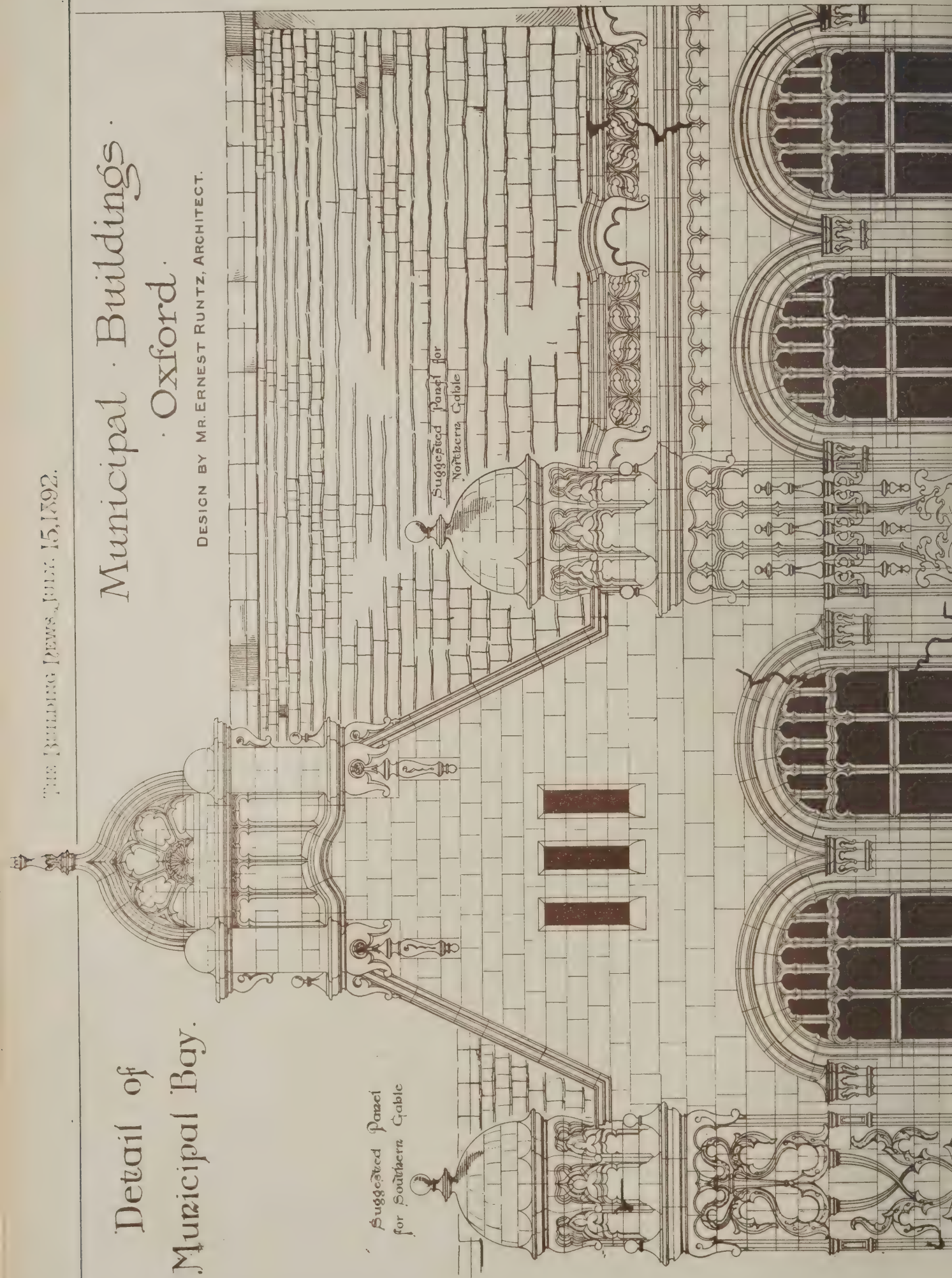
Detail of Municipal Bay.

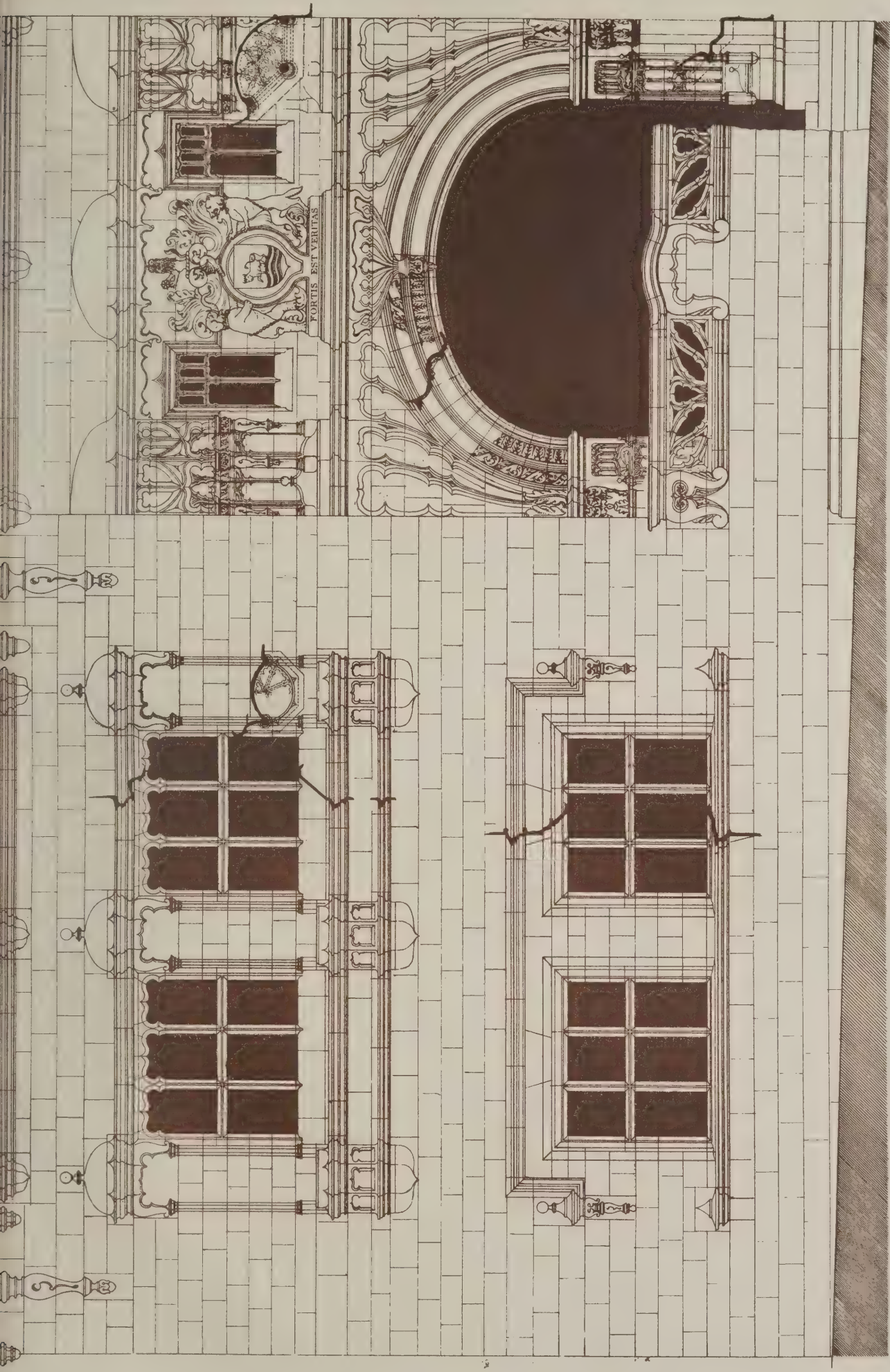
Municipal Buildings Oxford.

DESIGN BY MR. ERNEST RUNTZ, ARCHITECT.

Suggested Panel
for Southern Gable

Suggested Panel for
Northern Gable





Scale of Feet

THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1959.

FRIDAY, JULY 22, 1892.

WHICH WAY TO STEER.

THE course of an enduring profession like ours, as it passes on through successive generations, should be, not a helpless drifting, but a skilful steering. The question is, What points are we to make for—what direction are we to take? In the history of a nation there are moments like the present, when such an inquiry comes to everyone, and when everyone has to answer it with such faculty as he possesses. In the history of a profession it is not so. An architect, for instance, may go on from youth to old age, minding his own personal affairs, and nothing beyond them. The relations of architects to the public and to the art they practise may be quite outside the limits of his thought; yet if these relations grow worse instead of better, he can hardly fail to suffer, although, like the Parliament which Guy Fawkes proposed to annihilate, he "may not see what hurts him."

First of all, if the architectural profession is to become more useful and more respected, it must steer in the direction of improved early training. Something has already been accomplished here, but much more remains to be done. Architects still in the prime of life remember and regret the wasted years of their long articleships. The pupil entered an office, perhaps, at fifteen. For the first twelvemonth he was taught how to strain drawing-paper, and how to clean the boards on which it had been glued down; how to rub-up Indian ink, and, on occasion, how to light the office fire. These are useful—nay, almost indispensable—accomplishments; but with ordinary capacity they can be acquired in a week. The second year was spent in tracing, and perhaps the third and fourth likewise. Explanation of drawings were seldom given, even in reply to questions. A diligent youth by keeping his wits about him could pick up a good deal, but if he were not diligent he learned nothing except the management of pens and compasses. Finally, in the fifth year, he would be allowed to visit buildings in progress. Amongst these he might idle about all day, or he might fit himself for future success, and then he was shaken off, to sink or swim as it happened. At the present time a five years' articleship is rare. Pupils and their parents think three years quite enough. Now where little is taught beyond paper straining and tracing, even three years are too much; but three years, although well spent, will seldom fit a young man for any appointment to which a salary is attached. The consequence is that the profession is crowded with imperfectly-trained junior assistants, while really competent men are as scarce as ever.

A great improvement on the present plan would consist in spending three years in an architect's office, learning drawing, construction, and architecture proper, and then two years in elementary work at the various handicrafts. The young architect should make, with his own hands, the joints in a roof; he should work at framing and panelling, and learn experimentally the differences between good timber and bad, and between one sort of wood and another. He should be able to make up mortar, cement, and plaster, to build walls of different thicknesses in different kinds of bond, and to point them in various styles. In masonry, he should at least work plain and tooled faces in half a dozen sorts of stone, and should be thoroughly well acquainted

with the bed in every one. In modelling and plastering he might go further, and use his artistic powers in producing ornament. He should do at least as much practical plumbing as would enable him to solder a pipe and to lay a lead gutter; he should do enough pattern glazing to impress on him the conditions under which it ought to be designed; and enough light blacksmith's work to make him understand welds and scrollwork. After such a training he would return to an office a really valuable man—capable of superintending buildings, and having something like a clear idea of the principles on which details ought to be designed. But he would have to work at his handicrafts, and not to play at them, which is just the point where architectural students, who enter a builder's workshop for practice, commonly fail.

The fact is, a builder's workshop is not the right place for such a training as the architectural student needs. What a builder aims at is, very naturally and properly, to get his own work done. An apprentice learning the mere rudiments of a trade, and never likely to grow into an accomplished workman, is simply a nuisance to him. At best he can only give such a student the run of his premises, and let him improve himself as he may by seeing what happens to be there at the moment. This, perhaps, is not at all what the student wants to learn. Probably it is too far advanced for him, or not of the right sort in some other way. He needs rather to go to a place where he will get progressive training, from the very simplest to the more advanced kinds of workmanship, where the work will be adapted to his capabilities of doing it, and where he will be led steadily on from one stage to another. He wants, in short, to go to a thorough technical training school specially meant and fitted for the turning out of architects. Whether, amongst all the technical schools lately begun or proposed, there is just such a school as this, we do not know. If there is, every young architect ought to be informed of it. If there is not, the professional societies, and even the Royal Academy itself, might do much worse things than to begin it. In time it might grow into a real school of art—a force that would influence for good every British craft and manufacture. Pupils passing through it might, some of them, find that they had skill and invention which would help them on in the subsidiary arts more rapidly than in architecture itself. This would be a gain in many ways. The architectural profession would be less crowded, the arts which are allied to architecture would receive the improvement they need, and architecture would consequently be more and more ready to make use of their help. Yet no technical school, by itself, will make an architect. Office training will still remain a necessity. Scale-drawing and perspective drawing will always have to be learned. Construction, in the larger sense, is beyond the grasp of the technical school. Planning, on which an architect's success so much depends, belongs to quite another province; and so, in the main, does architectural composition. All these, and a hundred other things, can best be learnt in an office; but the man who has learned them would use them with double power if he also had the faculty which comes from practical acquaintance with materials and labour. So far, there is reason in the contention of the arts and crafts architect, and, so far, he ought to be heartily supported.

The next point to steer for is the requirement of a certain standard of professional knowledge from every man who aspires to be an architect. Here there are two alternative ways. Suppose that an examination is agreed on, comprising the matters which it is indispensable for practising architects to know. Is everybody who passes it to be

thenceforth acknowledged as an architect and admitted to membership? This is, practically, the view which the Institute has lately taken of the matter. It has been almost a thing of course that everyone of good character who could pass the examination should very shortly after be elected as an Associate. The results, in some cases, have been singular. Many people have a faculty for passing examinations who seem to have no other faculty whatever. The most incompetent of assistants—the most helpless among clerks of works—have qualified themselves in this way, and thereafter have never ceased to sign themselves Ass.R.I.B.A. Of course, some of the ablest of our rising men are also amongst the Associates of the Institute; but they can hardly care to march through Coventry with such companions as these. The net result of the system is that the title amounts to nothing. It may belong to an architect of the highest promise or to a sham architect who ought never to have entered the profession.

An architect is, or ought to be, a man who can produce architecture. If he cannot produce it, the title of architect should not be conferred on him. Let him, by all means, have credit for what he knows; but do not give him a name to which he has no right. If he passes in theoretical construction, let him have a certificate for theoretical construction; if he passes in surveying, let him have a certificate for surveying. Let justice be done to him, and let the path be open by which he may attain the higher rank when he deserves it. No amount of success in examinations will make the pupil at a naval school into a captain, or even into a first lieutenant. He must pass his examinations. It is true, before he will get the chance of becoming either; but to become either he must also have prolonged practical experience, and show considerable practical ability. So it should be with architects. The examination should be an indispensable preliminary. There should (when the system has once got into fair working order) be no admission without it. But it should not be valued at more than its worth. It should not be supposed to prove that a candidate who can answer questions about the strength of materials and about similar subjects is able to plan, design, and construct a satisfactory building. It proves nothing of the kind; but it is just this that needs proving before a man is entitled to be described as an architect.

This, of course, has a bearing on the question of registration. The great objection on the part of those who oppose it seems to be its supposed tendency to put all who are registered as architects on the same level. Mr. Compo, it is said, who failed two or three times as a jerry builder, and ultimately developed into a jerry architect, will, if registered, be looked upon by the public as the equal of Mr. Waterhouse, Mr. Pearson, or any other architectural member of the Royal Academy. This, of course, is exaggeration. See how registration works in another profession. In the main, the public thinks that the doctor is a doctor, and that one doctor is about as good as another. There it is wrong; but it does have the sense to realise that for certain diseases certain medical men are immeasurably superior to others. It consults them under enormous difficulties as to the distance and expense, and pays them for their time at something like a guinea a minute. So far registration has not put all members of the medical profession on one level. But it has put a great many of them there, and has lumped together scores of the skilful with hundreds of the unskilful. It is the prospect of a similar lumping together in our profession, which has made the idea of a uniform registration so distasteful to many able men. But is it not possible to make the passing of an examination legally indispens-

able, without at the same time allowing it by itself to confer the title of architect? Why not adopt an examination on the lines of the naval, rather than of the medical one—an examination without passing which there is no entrance to the profession, but after passing which the candidate must show his abilities in more practical ways before he is put into any post of high responsibility.

The last point to steer for which we can refer to to-day is that of a better system of remunerating professional services. Here, even as matters now stand, all architects are on a level. With the rarest exceptions, none of them value their work at more than 5 per cent. on the cost of their buildings, and yet the real differences in value are enormous. Except in the case of very large or excessively plain structures, 5 per cent. is about as low a charge as it is possible to make and live. There is no adjusting matters, therefore, by keeping this as the payment of the most accomplished men, and by giving the less and less able proportionately lower fees. It is very difficult to make a change without changing for the worse; and probably registration, in some form, must be effected before any real improvement will be possible. Yet improvement here is a main point to steer for. Payment by commission looks dubious, if it is not actually so. An architect seldom goes into court without being told that this form of remuneration cannot be enforced unless there has been a previous agreement to it. What it means is, that the ablest architect shall get no more for a given amount of labour than the feeblest one; and what it results in, therefore, is that clever men, instead of charging more for their work than others, can only increase their incomes by taking more work than they can properly do. Thus the country does not get their best out of its best men. Architectural pot-boilers and architectural masterpieces are both paid for at the same rate, and the wonder is, therefore, that our cities do not consist entirely of the first, without even an occasional approach to the second.


THE BLOCK AND QUADRANGLE.

IN these days of densely-packed areas and concentrated building it becomes of great importance to make the most of the space at our disposal. How we ought to dispose our buildings for domestic and public purposes is one of those questions about which promoters, owners of property, and architects are not very decided. The idea is that if we cover the land with building and increase the number of stories we utilise the space to the best advantage. Little argument is required to prove that this plan deprives the building of two great necessities, light and air, both of which must be derived over or through surrounding premises. The greater the space covered within the given boundaries, and the higher the building, the greater is the need of area for necessary light and ventilation, or, as it practically works out, the less habitable and healthy it becomes. In a deep, solid building light can only be admitted through the four sides, therefore the inner rooms and corridors suffer from deprivation of light if sufficient interior light areas are not provided. Every architect who has designed a large solid block of dwellings or offices in flats is aware of this difficulty. See, for example, how many large blocks of offices and residences in Victoria-street, Broad-street, Chancery-lane, and other City streets are spoilt by the darkness of the interior rooms deriving their light and ventilation from small areas of considerable height which have the appearance of shafts. Even as offices these inner rooms are too dark and dismal to work in without gaslight, the requirement of which adds much to the rental paid for the flat or suites of rooms. The isolated block is of course

less objectionable than the solid engaged block in a street. We mean one with an open space all round, but even the isolated building may lose its advantages by being carried several stories, as a hospital pavilion may suffer if it exceeds in height the space between it and the adjoining pavilions. The "block" system is seen in its full development in the lofty tenement-house of New York or Chicago, or in this country in the monster hotel or block of flats, and in these the system reaches its culminating point of mischief. The floors are ventilated from one to the other, the lifts and staircases serve to conduct the air and to render it impossible to preserve that hygienic condition of purity which is absolutely essential, besides implicating the whole block of floors in case of fire. A paper read at the late Health Congress went to show, from carefully prepared statistics, that the mortality of hotel servants was higher than that of any other class, owing mainly to the impure air breathed in the dormitories at the top of the hotel. What are we to think of such immense blocks as those of the Masonic Temple, the "Manhattan," the Auditorium, and the Title and Trust Buildings of Chicago, with their numerous stories? Some may naturally ask whether these buildings are legitimate architecture, or are not merely *tours de force* of a very vulgar order. Many of them are huge blocks of offices packed on each floor with rooms lighted partly by side courts. Architecturally we are ready to admit that some of them exhibit considerable skill in the attempt to give expression to vertical masses of numerous windows, and in the bold treatment of the lower granite or rusticated basements; they overwhelm and impress the eye by the great mass of superimposed stories, but we cannot affirm that their merits are equal to the effort and cost. As the solution of a hygienic problem, we certainly consider these buildings huge blunders, occupying space and blotting out sunlight, for which they give no compensation. In the event of any epidemic or fire breaking out, the consequence to those living on the various floors is simply disastrous. We might go on enumerating objections to the "block" system of building; one of the greatest is the crowding on a small area of a larger number of human beings than is desirable or safe. A well-known hygienist, Dr. Poore, of University College, lately said, "The fashion of piling people in heaps, and offering libraries and bagatelle-tables as a compensation for a garden, must come to an end." Another is the friction of so large a number of people in one block through the want of more entrances.

But the æsthetic reasons to urge against the "block" system are quite as strong as the hygienic, and it is almost needless here to say anything on this ground. Our great blocks of buildings in London are disfigurements. Northumberland-avenue has well been called a "draughty, gloomy gorge of bricks." The monster blocks and residential flats in the West-end are painfully dismal, destroying that personal liberty which is more than ever necessary in residence in great cities. And as every architect is aware, all idea of proportion is destroyed by a huge façade, which cannot be properly viewed from any point within the confines of an ordinary street.

Let us now turn from the "block" to the quadrangular disposition of buildings, and let us see how it may give advantages most needed in town life. By the quadrangular system we mean building round a square or courtyard, or placing the blocks in such a manner that sunlight and air can penetrate the innermost rooms and infuse life and cheerfulness to the inmates. We cannot in our cities obtain large quadrangles or grass-plots like we see in Oxford and Cambridge, and which impart

such a picturesque charm to those University towns; but we may at least try to plan our large buildings for offices and residential purposes with more reference to the area at our disposal. For instance, it may sometimes be advisable to build two or more blocks instead of only one, separating them by courts. If the ground is wide enough we may put a longitudinal building down the centre, with one or two cross blocks, which would give four or six courts; the two front ones near the street could be planted, immensely enhancing the frontage, the remaining courts behind affording light and air to the inner blocks. These areas, by reducing the depth of each block, render it easy to light the several apartments and corridors, promote cross ventilation, and simplify the roofing. The narrow-fronted building to a street, with a considerable depth, is always a nut to crack, especially if it has to be built solid. Without a central area, the lighting of the middle rooms is impossible. Is it absolutely necessary to build it solid? May it not rather be planned to inclose an area on one side? An area in the centre would, of course, be impossible in a long narrow site. Suppose we make the front and the rear parts return the whole width, leaving a long building connecting them with a side area. The shape of block would be a long  (looking at the plan sideways); the area thus left would give light to all the rooms between the two return ends, and such a plan would admit of a side façade as well as a front.

Examples of buildings inclosing courtyards may be seen at the Bank of England and Royal Exchange, St. Bartholomew's Hospital, Courts of Justice, Gray's Inn, New Inn, Somerset House, Government Offices, Whitehall, Burlington House, Buckingham Palace, and several other public buildings in London. The beauty and variety of those edifices are derived from this source of effect. Mr. Waterhouse, in the Manchester Town Hall, has disposed his blocks round a triangular area, in which the central hall is placed. The main corridors surrounding the building internally receive their light from the area, and are made to contribute to internal picturesqueness. The Municipal Buildings at Bury and Sheffield are planned with open courts, the office blocks arranged round the triangular and irregular sites. The open court may sometimes become a central hall. The quadrangular courts and halls of the lately selected South Kensington Museum extension design exhibit this idea, and the design selected for the Glasgow Art Galleries, which we have lately illustrated by plan and elevation, is instructive as an example of a long rectangle having a large central hall placed transversely with a court on each side. As will be seen in these latter instances, a great public hall may sometimes take the place of an open quadrangle round which the solid blocks are grouped.

The quadrangles of Oxford impart to that city all its character, and distinguish it from the modern town of to-day. Who has not admired the quadrangles and surrounding buildings of Merton, Magdalen, and Christ Church, the gateway and quadrangle of Brasenose, and the cloister and domestic charm of Magdalen? We cannot hope or expect to build now these beautiful retreats, removed from the noise and bustle of town life; even such secluded courts and inclosed gardens as those of Garden-court and Pump-court in the Temple, or the pleasant squares of Staple Inn and Gray's Inn, of Bloomsbury and the West End, are not likely to be repeated, owing to the increasing value of land in London; still there are opportunities offered by the demolition of large building areas, which would enable the owners of ground and the London County Council to avail themselves of planting squares and small inclosed gardens, instead of allowing them to be occupied by solid blocks. If an area

in the rear of houses can be obtained, it would be conferring a greater boon on the public to lay it out as a square or garden court, to which the surrounding houses can have access, than if such a space were divided amongst a number of houses in the shape of back yards that can, and generally do, get built over or filled with rubbish. This mode of appropriating old garden ground or back areas is probably the most judicious that could be followed in towns where so much waste back space is obtainable. For example, would it not be better to purchase the back yards of a score of houses that are now only used for lumber, and make a square or recreation ground of them, than to convert them into another roadway or sell the land for building? The larger sites of some of our new polytechnic institutions may well be utilised as squares or gardens. In these matters of laying-out towns our insular prejudices are much against us, and we may derive profitable suggestions from our Continental neighbours, who have always preferred to build round a square or a quadrangle than to pack solid blocks between parallel streets.

DECORATION.*

(Concluded from page 90.)

AND now to come to my special subject, I will give some hints as to the best manner of treating of a middle-class dwelling. I will begin at the entrance hall: of course there are many ways of dealing with this as with every other part of the house, so I may give several modes of treatment. It has long been the custom to treat the hall and staircase as unimportant parts of the house, to give them little or no attention, and so they have presented a naked, cold, and uninviting aspect—places to be hurried through as quickly as possible. The ceilings have been left white, and the walls painted one plain unbroken tint of drab or stone colour. The visitor obtains his first impression of the house on entering the hall, and it is desirable that he should be well impressed. We may first consider the ceiling: it should not be pure white, as garish whiteness is out of accord with all other colouring, that is, in connection with house decoration (the whiter your shirt fronts are the better). Well, the ceiling may be painted some shade, such as light vellum, or fawn colour, or some light shade of blue, neutral in tone, such as the shade presented in the duck-egg shell. The ceiling tint will be regulated by the colouring of the walls. This toning of the ceiling is good, so far as it goes, but there is no limit to the various ways it may be decorated. Stencilled ornament is one of the less expensive modes. And here, in speaking of stencilled ornament, it must not be thought that this is necessarily a cheap and nasty method of ornamentation, because we are all familiar with wretchedly designed and executed work of this kind. A stencil is a design cut in firm paper, cardboard, or tinfoil, and the colour is stamped through the openings, in all manner of printing. Now all manner of printing is not artistic, yet the capital letters in old Italian and German books are full of artistic design, yet they are printed too, so with the stencil plate. It first of all has to be designed, and the highest powers of draughtmanship may be brought to bear in the production of high class stencil work, the same design may be traced directly by hand, but the stencil plate is used as a quicker method of obtaining like results. The reason why so much work of this kind is inferior, is simply because it is difficult to do it well. Preston Town Hall, in England, decorated by Heaton, Butler, and Bayne, the eminent glass stainers and decorators, is nearly all stencil work, but yet it is one of the best decorated halls in England. I don't recommend stencilled in place of hand-painted work; where money is forthcoming, I prefer to do the latter. But to return to the hall ceiling, it is a simple and inexpensive way of getting a pleasing effect, to put a band of well-designed ornament round the ceiling, its breadth being regulated by the vestibule or hall, and there is no reason why the centre of the

ceiling should not be covered with a simple geometrical design in quiet colours, and treated flatly, without light and shade. A little gilding introduced in small spots and thin lines defining the leading forms of the diaper or panelling has a very good effect, but there is no limit to the richness and quality of design that may quite fitly be expended here; also, there are many alternate modes of treatment besides painting. There are beautiful paper hangings, specially designed for ceilings, besides several embossed or raised materials, such as Tynecastle tapestry, anaglypta, and Japanese leather papers, which, when harmoniously coloured, produce most pleasing effects. The cornice should be coloured to connect the ceiling and walls, care being taken to use light shades where the mouldings and enrichments are delicate. The treatment as to the division of the walls will depend on the height of the ceiling; but generally speaking, it is good to put a frieze under the cornice, and it is useful to have a dado here and in the staircase, following the rake of the handrail. The dado and wall space should be separated by a wooden mounted rail. The dado should be highly varnished, so as to allow of washing and dusting without the risk of soiling. The colour of the walls should be pleasantly warm—such as terracotta or even Pompeian red—the dado in deeper shades of the wall colour. Soft olive green is also good for staircase walls; blue, unless it be of the peacock shade or approaching a grey-green, had better be avoided here. The steps of stair, if of wood, should be stained a deep walnut colour; or if they be of stone they may be painted a dark shade of the dado colour, and varnished to allow of cleaning frequently. The hall and staircase walls may be papered. There are special designs made for the purpose that look very well, indeed, having friezes and dadoses specially coloured to match. The hall is a good place to hang etchings, autotypes, and engravings in quiet oak or black moulded frames, and where they form a special feature of the decoration, the walls should be painted a quiet shade, as a florid patterned paper detracts from the value of the pictures. The carpets and *portières* should be in strict harmony with the decorator's work, and should be chosen by him or the architect. I have often seen the whole harmony of colouring in a house destroyed by the unskillful selection of the carpets and hangings. The woodwork should be painted in one or more shades of maroon, or other rich brown colours and varnish; all graining should be avoided. I must confine myself to broad principles as I proceed, as I could multiply varieties of treatment without end. The dining-room should be sombre in tone, the ceiling a vellum colour in depth to suit the walls. It may be divided by wood mouldings into geometrical panelling, and these panels filled with Tynecastle tapestry or anaglypta. The effect of this is as if it were executed in low relief plaster work. The designs manufactured now are very beautiful. If the ceiling is treated in this manner, the walls may also be decorated with the same materials, for there are friezes and wall hangings made of the same stuffs. The painting and gilding on these surfaces can be as simple or as grand as may be demanded. They are capable of many and varied beautiful treatments. Immediately under the frieze should be fixed a moulded picture rail; this is much better than a metal rod, as it goes round the entire room as the cornice does. Its distance from the cornice will depend on the height of the walls. The advantage of lowering the picture rail is that it affords greater ease in hanging the pictures, and prevents the unsightly cords being seen to the same extent as when going to the cornice; by shortening the cords, too, pictures hang steadier and the chances of breakage are lessened. The moulding can be coloured to be in harmony with the walls, and rendered almost invisible, or it may be gilt solid so as to form a marked boundary to the frieze. The colouring of the walls should have reference to the pictures, and should not be too light in tone. Experience has discovered that dark reds or old gold colour, not unlike rich brown paper or dull tones of green, either cool and grey, or warm and brown, are the best for showing pictures to advantage. I painted the dining rooms of two of the Royal Academicians in London—Pittie's and McWhirter's—and in both cases the colour selected was a dark grey-green. Both artists found the full value of the colouring of their pictures brought out to the fullest extent on this dark background. The Royal Academy

walls are coloured a dark Indian red, and so also are the walls of the British National Gallery. As chairs are placed round the walls of the dining-room, it is good to put a chair-rail at the height of the chair-backs; this prevents the chairs from breaking the plaster. The dado should be coloured in relation to the walls above, and a good many shades darker; the dark dado takes from the bareness of a large room, and gives a cosiness and furnished appearance which does not exist when you can see each piece of furniture clearly defined against the walls. The woodwork should be painted good solid colours of Indian red or walnut shades, or black resembling ebony. I do not recommend decorating the panels with any kind of natural-flower designs. Thin flat hand-painted ornament in ivory-colour, resembling, but not imitating, inlaid work, is chaste and beautiful; if the wood is of good quality the panels may be decorated with various stains, in full and rich designs. I have decorated the saloons of many of the great ocean steamships in this manner. It is best to French-polish surfaces decorated in this way. As yet, I have dealt with the ceilings and walls as covered with embossed materials—either in low or high relief. The ceilings, where dust cannot settle, may safely have the designs in high relief, but those in low relief are more suited to the walls. The walls themselves may be formed into well-proportioned panels, not so small as to interfere with the placing of the furniture or the hanging of the pictures. The panels should be divided by wood mouldings and there should be a stile round each treated in flat tints of such a kind as to show the panel colouring to the greatest advantage. The French are partial to this mode of treatment, and I think it a very good one. It gives a rich, furnished appearance to the walls. Both ceilings and walls may again be oil-painted and decorated in a hundred ways. I have painted many of the finest houses in Scotland in this way, the ceilings being entirely decorated by hand with figures, wreaths, and ornamental compositions; the walls also being decorated with the like, specially designed, and hand-painted ornament. This is the most artistic manner, and no two houses are ever painted in the same way. Of course, ordinary wall papers may be applied here as everywhere else in the house, and if chosen by an expert very fine effects may be obtained in this manner. I don't think there is a wiser way of spending money than in making the home beautiful. Our wives and families spend most of their lives at home, and the enjoyment derived from beautiful surroundings is beyond estimates besides the refining influence it has on our children, there is no pleasure so constant, so soothing, so lasting and elevating, as that afforded by a lovely home. It is the most unselfish pleasure—pleasure, too, as all our friends may share it. In a room where there is heavy furniture, it is good to have a margin of, say, 30in. round the floor uncarpeted, so as to allow of the carpet being frequently taken up and shaken. This margin may be painted in some dark shade, agreeing with the carpet and dado—or if the floors are new they may be stained to a dark oak or walnut colour, and in both cases varnished. Wax-varnish is more artistic in effect, but is more liable to soil, and takes much more labour to keep in good order, and parquet flooring is better than either of the former, but is more expensive. The drawing-room is the ladies' special room, and should be bright and cheerful. It is difficult to deal with a subject like colour, to make you realise effects from mere description, and to describe in detail the many ways I could treat a drawing-room would merely confuse you, so I will be general in my remarks. All the materials described for the dining-room treatment would be applicable for the drawing-room. The dado is not so necessary here, as the chairs are not usually placed against the walls, and instead of the sombre hues suited to the dining-room, soft, quiet, and light effects are best, say cream or soft duck-egg shell, blue or French grey for ceilings, the walls fawn-colour or a richer French grey, or a deeper grey-blue, approaching peacock shade; all these are good for showing ladies' complexions and dress to the best advantage, and that is a consideration not to be overlooked. Water-colour drawings will also look well on these grounds; the woodwork may be creamy-white, finished with enamel varnish, this gives a beautiful, smooth and fresh effect. I think the judicious application of gilding in this room very

* Paper read by Mr. ANDREW WELLS before the Sydney Architectural Association.

advantageous, but the same remark applies to all the public rooms and hall. I think it is better to gild the small enrichments of cornices solid, than to break up the ornament of the large enrichments with points of gold, what is technically called hatching or picking out. The round, the concave, and small ogee mouldings always look well gilded, as their rounded surfaces catch the light from all points. The walls should be decorated with water-colour drawings, or etchings tastefully arranged; choice pieces of ornamental and Doulton pottery are beautiful and very decorative. I have fitted a narrow moulded shelf, supported on neat brackets all around the walls (except those occupied with cabinets), about four feet high from the floor, this shelf having a groove on the upper surface for holding plates and photos; this is to prevent them from sliding, and is a very pretty arrangement, as between the photos pretty pieces of pottery and statuettes may be placed. Above the shelf should be placed the water-colour drawings, etchings, and engravings. Or, instead of this narrow shelf, dwarf book-cases rising 3ft. high may be put around the room, and on the top of these the photos and ornaments may be placed. Books in themselves are very decorative in effect, besides the delight of sitting in rooms supplied with plenty of them. I think there should be many books in the drawing-room—it is the general sitting-room, and no one need ever be weary or suffer *ennui* who loves good books. I might speak for an hour of different modes of treating the drawing-room, but will here read the description of a house I decorated in Glasgow for Sir William Pearce—it will give an idea of the kind of work done in the houses of the merchants of the old country: The house of Sir William Pearce, the eminent ship-builder, is at 10, Park-terrace. This terrace crowns the hill overlooking the West End Park, and commands a view of the valleys of the Clyde and Kelvin, with the gently-swelling hills away to the south and west. The house has been decorated by Mr. Andrew Wells, of 8, Newton-terrace, Glasgow, a gentleman who has gained distinction by his superb work in the St. Andrew's Hall, and in many of the churches and residences of the city. In his work Mr. Wells shows himself a thorough artist; he evidently spares no pains in order to give his decorations the stamp of artistic perfection in design and execution. A draughtsman of great skill, taste, and spirit; a bold, original, versatile, and harmonious colourist, Mr. Wells has done not a little to vindicate the claims of decoration to be regarded as a living and growing art. In his work at Sir W. Pearce's house, he has had a splendid opportunity for showing his wealth of design, exquisite draughtsmanship, and skilful colouring, and of this opportunity he has fully availed himself. The entrance hall is divided into three parts by Corinthian pillars. The ceilings and walls are richly decorated with hand-painted ornaments and figures, each compartment being treated with special designs. The grounds of the ceiling of the vestibule are in various shades of light blue and gold, and the decorations generally in darker shades of blue, freely modelled, as in Persian tile painting. Thin lines of Persian red, orange, and gold are introduced very skilfully, to give emphasis to the framework of the panelling. The frieze is painted in darker shades of the ceiling colours. The cornice is tinted in shades of pale blue and fawn colour. The smaller enrichments and mouldings are gilt, solid Persian red being used with happy effect to connect the colours of the ceiling and the walls. The general tone is light, cool, and cheerful, and contrasts well with the full, rich treatment of the walls, which are divided into middle-space and dado. The ground of the middle-space is a delicate salmon colour; on this is planted a series of figure panels with gold backgrounds diapered with raw sienna. The figures represent the seasons; other spaces being filled by Italian arabesque and floral designs. A feature of the treatment of this panelling is the band of softened black which surrounds the golden centres. This band is about 5in. broad; it is bounded by gold and vermillion, and decorated with a very delicate arabesque in ivory colour. This combination of black, white, red, and gold produces a very rich and harmonious effect, and gives value to the lighter colouring of the ceiling and frieze. The dado is treated simply and broadly in various shades of dark brown, and varnished to give depth and support to the extreme richness of the walls above.

The cupola crowning the staircase is an especially happy piece of design. The cupola panels are of pale duck-egg colour, with stiles in cream-colour, enriched with broad and narrow lines of Persian red, and worked up with the colours of the panels to connect the whole together. The panels have subjects emblematical of Ceres and Flora on mosaic gold ground, with ornaments in Persian majolica blue, slightly modelled in delicate shades. The cornice is in deeper shades of the stile colours, relieved with gold and Persian red. The staircase upper frieze, immediately under the cornice and cupola, is about 24in. deep, and is enriched with groups of boys alternating with dwarf Renaissance columns, from which depend festoons and floral wreaths; over each of these festoons is a gold patera, while lighter and more delicate foliage fills up the background. Under the frieze is a Greek key and patera border, in shades of chocolate and black on a crimson ground; this gives a good solid base for the figures. The main walls of the staircase are coloured in stages, working from a soft red in the lower part to a warm primrose colour at the stair-head. The various shades of gradation are separated by bands of hand-painted ornament. The woodwork is painted with very dark Indian-red, toned with Prussian blue, and finely polished. Sketch No. 5 shows the ceiling of the dining-room. The ground is a rich cream colour, all the decorations being hand-painted in soft harmonious tones of olive-green, primrose, orange, and neutral tones of blue. The framework is mainly in lines of Persian red and gold. The general effect is warm and delicate. The frieze has a solid gold ground, decorated with a conventionally-treated floral design, the flowers being painted in shades of primrose-white, with hearts of citrine and delicate orange; the leaves are in shades of green, the whole being outlined with soft red. The walls are painted dark red, to form a good background for the splendid pictures which adorn this room. The dado is covered with dark russet browns, and panelled with darker shades of the same. The woodwork is painted dark chestnut colour, the panels being decorated with a beautifully-drawn Greek design in very thin lines of ivory colour, conveying the feeling of inlaid work, and giving an effect of elegance and refinement. The pillars at the end of the room are in dark chocolate and gold, the caps bronzed and lacquered, with the projections in gold; the whole being highly polished. Sketch No. 6 shows the arrangement of dado and frieze of library. The drawing-room ceiling is, perhaps, more daintily painted than any other part of the house. The leading colour is pale moonlight blue on a cream ground; this is contrasted by various other effects in warm but delicate tones. The corners are enriched with draped female figures; and in the spaces between are groups of winged boys bearing lightly-blown wreaths of ivy, and, guiding by gossamer bands, birds flying in couples. The ceiling border is in darker shades of the same moonlight blue, with flowers in cream, cinnamon, and gold. The walls are rose colour, with textile and gold effects. The woodwork is in shades of ivory, greenish-white, and duck-eggshell colour, with gold on the mouldings. The same thoroughness of design is carried throughout the house with an infinite variety of effect, which is as rare as it is delightful and charming. To Mr. Wells the decoration has evidently been a labour of love, and the success he has achieved is not only creditable to his versatility and power as a draughtsman and colourist, but also to his thorough conscientiousness as an artist-decorator. Nor should Sir William Pearce's share in the matter be overlooked. At a time when many merchant-princes, and others, are content to have their mansions painted and papered in the sleepy, commonplace manner proper to the dark ages of taste, he has had the originality and boldness to have his house done in such a way that each room becomes a delight to the eye and a source of perennial interest to all who enter it. This is the kind of work I should like to do here, and I believe more of it would be in demand if it were generally known that the necessary talent is at hand. The morning-room I will not describe further than to say it should be light and cheerful, and cool in tone. French greys and light blues are good. It may be painted entirely, and decorated in a simple manner, or any of the wall coverings may be used here quite fitly. The library is better to be subdued in tone, but not gloomy. The wall should be the background for rare prints and etchings, so it should be

painted, or if papered, some old rich leather effect is good, with a pattern not over conspicuous. The ceiling and cornice coloured to match, and the woodwork, as in the dining-room, dark and decorated with thin lines and ornament. The books should be easily accessible, and low book-cases, not more than 5ft. high or lower, look very well. I think it is better to have no glass in front of the books, except, perhaps, to protect the rarest or very valuable ones. I have observed that those placed beyond reach of the hand are rarely opened. The floor should be stained or painted all round, say, 1ft. in front of the book-cases, so that the carpets or rugs may be lifted without disturbing them. The bedrooms should be dealt with, as to the colour, according to their aspect; those getting much sunshine should be cool, and those in shade warm, in tone. I think it good to paint the ceilings and walls of bedrooms; the walls may be finished with a dark gloss; the paint being partly mixed with varnish. This allows of their being washed down without injury to the paint, and insures that they shall be always fresh and clean. Walls painted in this manner will last a lifetime; the walls and ceilings may be perfectly plain; but there is no reason why a ceiling should not be decorated in a simple way, with line borders and corner ornaments, or even in a fuller manner. In the children's rooms it is as well to have dados that may be fully varnished. Of course the walls may be papered, without any breach of the fitness of things, and lovely papers are to be had in plenty, and some are made purposely to allow of sponging down. They are called sanitary papers; they are quiet in colour and very serviceable. The woodwork should be painted to suit the walls, generally in light tones, and if varnished so much the better; it lasts much longer, and all finger-marks can easily be wiped from it. I think it is best to oil-paint the ceilings in all cases, it lasts for many years and is easily cleaned, and if renewed can be done without causing the dirt and mess that distemper always produces, when washed off. The margins of floors should, in all cases, be stained or painted and varnished, so that the carpets may be frequently shaken. Freshness and cleanness in the bedrooms is of the utmost importance. For the same reasons the kitchens and offices should be oil-painted, and not distempered. The paint can so easily be washed down by the servants. It lasts so much longer than distemper, that the difference in the first cost is soon made up. Here the woodwork should be varnished, and the walls, for 5ft. up, the same. A simple line should be drawn at the top of the dado. For the outside of cemented houses there is no treatment that so effectually resists the tentry of rain as to paint the walls thoroughly, and when applying the last coat, to powder them with fine dry sand; when dry, this makes so hard a surface that water cannot penetrate it. It is more costly than ordinary painting, but it is practically imperishable, and so cheaper in the end. As to the best colours for outside painting, I don't feel that any hard and fast rules can be laid down. All tones of stone colour, from cream-yellow to terracotta, and dark chocolate may be used. I would avoid shades of green and blue on the cement, except they be very mutual in tone; from white through yellow tones to dark red and brown are the most suitable shades. When the walls are painted dark colours, then the window sashes and verandah woodwork should be made very light, say white tinted with yellow, green, or blue, or even pure white. On the other hand, if the walls are painted in light colours, the window sashes and other outside woodwork may most fitly be painted in dark shades, say olive green, Indian red, or dark peacock blue. The above is a very general survey of the house, but perhaps as much as can be profitably introduced into an hour's lecture, such as this. It is impossible to more than treat the subject on the broadest lines. I am embarrassed with too much matter rather than with too little, for practically there is no limit to the mode of treatment for every part of the house. I am far from thinking there is only one good way of painting houses; there are many. For instance, if character is wanted, the houses could be treated in purely Greek design, or Pompeian, and they are beautiful styles full of refined designing, and affording scope for full harmonious colouring. The Renaissance is founded on the Classic, but treated with abundant freedom and grace by the Italians and other European nations. The

various French developments of the Renaissance have their own beauties—Louis Quinze and Louis Seize are full of character, lightness, and elegance. But while I have seen much of this high class work and executed some, the ever-present regret one feels in the colonies is that so little of it is in demand. The country is probably too young, and feels itself bound to be content with humbler things until it can afford better. But of one thing I do complain, it is the system of tendering for every kind of work. Every contractor is assumed to be equally able to do artistic work. Cheapness is held to be the criterion of merit and not quality. Things are different in England. A man of merit there is treated with respect, and his worth acknowledged. I suppose things will improve here as we develop a richer and more leisured class. As this class grows, so the appreciation for art work of every description will grow with it. A consummation much to be desired!

LAND SURVEYING AND LEVELLING, AND THE TESTING, ADJUSTMENT, AND USE OF MATHEMATICAL INSTRUMENTS.

By G. W. COBHAM, P.A.S.I.,

("Crawter" and "Special" Prizeman of the Surveyors' Institution.)

(Continued from page 5.)

CHAINING ON SLOPES.—In the preceding articles we have assumed that the ground to be chained was flat and level. We now come to the question of dealing with slopes.

Fig. 32.—This is a section of a portion of a

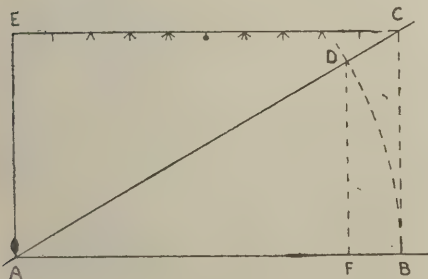


Fig. 32.

chain line. AC is the ground line, AB is horizontal, and BC, FD, and AE vertical; AD is equal to AB. It is always assumed that the lengths on a survey are the horizontal lengths, and it will be evident from the figure that if AD be one chain, the horizontal distance AF will be less than one chain by the distance FB. One method of obtaining the correct distance is to hold the chain horizontal, as CE, the point A being determined by means of a plumb-bob, the string of which is held with the chain-handle at E. There are two obvious objections to this method. One, that there is usually great difficulty in judging whether CE is horizontal unless there are buildings in the neighbourhood that it can be lined with; a small error would not, however, much matter in ordinary work. The other objection is that a chain held off the ground will sag in the middle, making C and E too close together; this can be remedied to some extent by making CE shorter, half a chain or less, but then the continual changes render mistakes easy to make. The best way of finding the true distance is to observe the slope of AD and make allowance after having measured the actual distance AD. The slope can be accurately measured with a theodolite, but it usually is not at hand when chaining, and a small clinometer about as big as a watch is quite accurate enough for our purpose. The various kinds of clinometers will be described under Levelling. It is evident that a clinometer with a bearing surface barely 2in. long will not give a correct result if simply put down in the middle of the chain, as a stone or a hole would vitiate the result. It is usual to lay the offset rod on the ground, and place the clinometer on the rod. The rod being a considerable length, averages the inequalities, and gives the general slope of the land. The following table gives the number of links which have to be deducted from each chain, when chaining on the slope, to give the correct horizontal distance to the nearest quarter link. It

is calculated from the formula $F B = A B \cdot \sin. C A B$.

Angle of Slope.	Deduction.	Angle of Slope.	Deduction.	Angle of Slope.	Deduction.
4 0	1	9 30	1 1/4	15 0	3 1/4
4 30	1	10 0	1 1/2	15 30	3 3/4
5 0	1	10 30	1 3/4	16 0	3 3/4
5 30	1	11 0	1 3/4	16 30	4
6 0	1	11 30	2	17 0	4 1/4
6 30	1	12 0	2 1/4	17 30	4 1/2
7 0	1	12 30	2 1/2	18 0	5
7 30	1	13 0	2 3/4	18 30	5 1/4
8 0	1	13 30	2 3/4	19 0	5 1/2
8 30	1	14 0	3	19 30	5 3/4
9 0	1	14 30	3 1/4	20 0	6

When the slope exceeds 20°, the surface should be chained, and the angle observed with a theodolite, when the true horizontal distance is given

CROSS STAFF

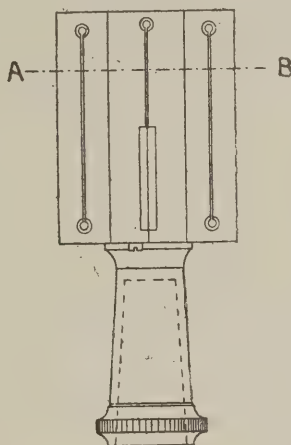


Fig. 33.

by the formula $A B = A C \cdot \cos. C A B$. The allowance can be either made in the field, or it can be entered in the field-book and made afterwards. When each chain has its allowance of a few links, the allowance for other points in the line is complex, and errors are liable to creep in, so that in practice, instead of deducting the links from the chain, the chain is pulled forward a distance equal to the allowance. This method is not quite accurate, as it supposes that $D C = F B$, which is not the case; but the error is inappreciable when the angle is small. A table can be calculated from the formula: $D C = A B \cdot \sec C A B - A B$; when $A B = 1$ chain $D C = \sec C A B - 1$; moving the decimal point two places to the right gives the result in links. The result for 20° gives an allowance of $6 \frac{1}{2}$ links,

CROSS STAFF SECTION A. B.



Fig. 34.

so that the last table may be safely used up to that angle. When the chain is so pulled on, the arrow is put in and one chain is counted. If the allowance is large, a proportionate allowance may be made to get the true places where offsets are taken, but unless the ground is very steep it is not necessary. It is not the error in one chain that matters much, it is the accumulated error in long distances. It is, perhaps, hardly necessary to note that the chain must be pulled forward the same distance whether measuring up or down hill.

The Cross Staff.—This is a small instrument used to set out right angles for rough purposes, such as lines for cross-sections, &c., and is shown in Figs. 33 and 34. It is usually made of brass, and the cone at the bottom unscrews and screws

into the inside of the upper body for convenience in packing. It is not always octagonal; sometimes it is made cylindrical, and sometimes spherical. One side has a fine slit half-way down, and below this, and in the same line, there is a wide slit with a wire down the centre. Each narrow slit has a wide one opposite to it. For use, the eye is applied to the narrow slit, and the rod sighted through the wide one, the wire showing the exact place where it should be put. The long, narrow slits in the other four sides are to enable angles of 45° to be set out, but they are of no practical use. For use, the instrument is supported on a stand, the top of which is made to fit into the cone at the base of the cross staff, and in which it freely rotates, enabling the instrument to be turned in any direction. It is necessary for accurate work that the instrument should be upright, but there is usually no means of telling whether it is so or not. Sometimes the cross staff head is cut horizontally through the middle, and made to turn with a rack and pinion, the edge being graduated so that any angle can be set out. It is not capable of doing this with any great accuracy, owing to the necessary thickness of the wires. Some forms of the instrument have a trough compass on the top, so that it can be used to take the magnetic bearing of a line.

Fig. 35.—This shows the general scheme of testing any instrument made for setting out right

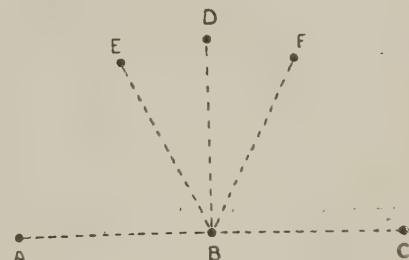


Fig. 35.

angles. A, B, and C are put in the same straight line, and the instrument is set up over B. One sight is put on A, and D is set off in the line of the other sights purporting to be at right angles with the first. The sights on B D are now put on B C, and the sights first put on A used to set up the perpendicular. If this coincides with D the instrument is correctly adjusted (Euclid I. Def. 10). If the instrument was not in adjustment, and the staff was put up at E at the first observation, it is evident that another will be set up at F on the second observation, the angles E B A and F B C being equal, and the angle E B F double the error of the instrument. A staff set up midway between E and F will be in the perpendicular from B, so that by double observation an imperfect instrument may be made to give a correct result.

ERRATA.—On p. 5, column 1, line 36, for C D read C B. On p. 5, column 2, line 7, read: "will be the length A X; or, $A X = A C^2 / A B$." On p. 5, column 2, line 8 from bottom, for C E read C F.

(To be continued.)

THE LIVERPOOL WATER SUPPLY.

AS we briefly announced last week, the Duke of Connaught inaugurated the new water supply of the City of Liverpool on the 14th inst. The scheme is a grand one, and should make all Londoners ashamed of themselves. It has been twelve years in hand, and has cost £2,132,867. When it was started it was expected that the work would be finished in four years and would cost £1,559,996. Vyrnwy is 77 miles off by the route which the aqueduct takes. It is, we believe, the longest aqueduct in the world. The principle of the scheme is the same as that adopted in Longdendale by the Manchester Corporation. Vyrnwy Lake has been brought into existence by throwing a great dam across the valley of the river. The village of Llanwddyn was sleeping in the heart of the valley when the Corporation came upon the ground. It consisted of a church, two Nonconformist chapels, and some forty cottages. The village was destroyed, and a new set of houses was built higher up on the hill. The great feature of the work is the

embankment across the valley. It is built on a foundation of solid rock and into the solid rock on either side of the gorge. The lake behind it is about five miles long, half a mile wide, and in parts 84 feet deep. To resist the enormous pressure every precaution has been taken in constructing the embankment, and it is satisfactory to know, on the authority of a great engineer, that nothing short of an earthquake can damage it.

The water supply of Liverpool, and of the district of which Liverpool is the centre, has been under the control of the Corporation since the year 1847. Up to that year the waterworks were in the possession of private companies, who obtained water from wells sunk in the new red sandstone on which the city is built. The supply given by the companies was very inadequate, the water only being allowed to be on for two or three hours a day, and that only once or twice a week. When the Corporation acquired the waterworks they came under obligation to provide such a supply of water as would permit of water being constantly laid on to every house within the limits. To enable them to accomplish what they had undertaken it became necessary to obtain a very much larger quantity of water than was then available. Many schemes were suggested and investigated, and ultimately a large tract of wild moorland in hilly country between Bolton and Blackburn, in Lancashire, was selected as the source of supply. In the valleys below these hills extensive reservoirs have been constructed capable of holding upwards of 4,000,000 gallons of water. These reservoirs extend upwards of five miles. The rivers and streams which flow into these reservoirs yield water of an excellent quality, especially adapted to the needs of Liverpool, and this is the scheme known as the Rivington water supply. This Rivington supply was brought into Liverpool in the summer of 1857, thirty-five years ago, and it was then expected that it would satisfy the requirements of Liverpool for a long future. In less than ten years the yield of Rivington and the wells proved insufficient to meet the demands of dry seasons, and although the Corporation had spent more than £2,000,000 on their water supply there was already a scarcity. The growth of population and the demands of trade were very rapid, and the spread of new sanitary ideas and appliances led to a constantly increasing use of water. For some years the deficiency was met by making additional reservoirs and sinking additional wells, and also by restricting the distribution and checking waste. In the meantime the examination of new sources of supply was vigorously proceeded with. The Council, warned by previous experience, resolved that any scheme adopted by them should not only be sufficient to supply Liverpool for at least thirty years, but should also be capable of being extended in such a manner as to satisfy any demands that could possibly be foreshadowed. Ultimately, and after protracted inquiry, the Vyrnwy scheme was chosen, and the Royal assent was given on the 6th of August, 1880, to a Bill for carrying out these works. In selecting this scheme the Corporation had the benefit of the labours of a Royal Commission, presided over by the Duke of Richmond, which in 1866-7 reported on the Vyrnwy Valley as part of a scheme recommended by an eminent engineer, the late Mr. J. F. Bateman, for the supply of London. The principal features of the Vyrnwy works as carried out by the Corporation are: (1) A reservoir in the Vyrnwy Valley among the Berwyn Mountains nearly five miles in length by half a mile in width. (2) This reservoir is formed by the building of a massive masonry wall across the narrow part of the valley. This wall is 1,172 ft. long at the top, and its extreme height is 161 ft. from the lowest part of the foundation to the parapet of the carriage-way. (3) The greatest depth of water is 84 ft. (4) When full the reservoir holds more than 13,000,000,000 gallons of water. (5) When the scheme is fully developed the reservoir will receive the rainfall from 23,200 acres of watershed, and the quantity of water which this gathering ground will yield will be sufficient to give Liverpool a supply of 40,000,000 gallons a day, after sending down the river Vyrnwy the compensation water which, under the Act of Parliament, the Corporation are bound to deliver in aid of the river Severn, and which compensation amounts to 13,500,000 gallons of water per day. (6) To convey the water from Vyrnwy to Liverpool the Corporation have constructed an aqueduct sixty-eight

miles in length, terminating at Prescott, a distance of eight miles from Liverpool. (7) About four miles of the aqueduct is in a tunnel capable of carrying the full supply of 40,000,000 gallons per day; but for the remaining sixty-four miles iron pipes have been laid to carry one-third of the ultimate quantity, or 13,000,000 gallons per day. The additional lines of pipes will only be laid as the demands for water increase. (8) The whole of the water will be filtered through sand filter beds, which have been constructed near to the town of Oswestry, in Salop. (9) The surface level of the Vyrnwy reservoir is 325 ft. above the Ordnance datum—that is, above the sea level at Liverpool; and the water is delivered at Prescott at an elevation of 275 ft. above the Ordnance datum. (10) Therefore, 550 ft. of head are expended in carrying the water by gravitation along the aqueduct. For engineering purposes, the aqueduct is divided into six sections, in each of which a balancing reservoir is placed for the purpose of regulating the pressure or head of water. The most difficult and tedious part of the aqueduct has been the crossing of the river Mersey. Here the Corporation, owing to the opposition of the town of Warrington and riparian owners on the Mersey, were compelled to form a tunnel through ground and under conditions which made the driving of a tunnel not only very difficult and slow to carry out, but entailed upon the Corporation a large extra outlay which was not contemplated in the original scheme. The Corporation are now in a position to command a supply of more than 30,000,000 gallons of water per day, or sufficient to supply the requirements of 1,200,000 people. When the Vyrnwy works have been fully developed the water resources of the Corporation will be sufficient for the necessities and requirements of a population of at least 2,300,000. The actual population now within the Liverpool area of supply is between 800,000 and 900,000. The actual average consumption of water per day is 20,000,000 gallons.

ART EXHIBITION OF THE LONDON SCHOOL BOARD.

A CONSIDERABLE advance in the art education of the pupils of the London School Board has been made during the years which have elapsed since these annual exhibitions commenced. On one or more of our earlier visits we remarked on the inferior kind of instruction given, or rather of the number of works which showed a misdirected application of latent art capacity, such as copies shaded and coloured from illustrated newspapers and comic serials. We have now to record an exhibition of artistic work done by the children and pupil-teachers which has been on view at the Law Society's Hall, Carey-street, Chancery-lane. Owing to the want of space it was found only possible to show about one-fifth of the 3,000 exhibits which were sent in. A recent development in art instruction is one of the leading features of this collection. We allude to the manual training on paper in colour, and in woodwork, which has been practised for the last two years we believe. This class of handwork forms a large proportion of the whole bulk of exhibits. The "paper work filling and supermounting," as it is called, consists in supplying sheets of cardboard divided into lin. squares, each of these being subdivided into $\frac{1}{4}$ in. squares, to the scholars, with sheets of coloured paper also ruled with the same squares, made adhesive at the back. The pupil takes these sheets, and upon them he can pencil any diagonal or other lines across or coincident with the small squares, and cut them out, neatly fitting or supermounting them on the cardboard in any design or arrangement he may invent, so as to form geometrical patterns, and in this manner he can exercise his faculties of invention and design. Prizes have been awarded to pupils, boys and girls, in many schools. Among these, the work of the Rolls-road Boys' School, the Dalgleish-street, the Burghley-road, Monson-road, Beethoven-street, and Ben Jonson schools must be particularly mentioned. Many of the ornamental arrangements of the coloured squares show much skill and inventive power that may be turned to useful account in pattern and tile designing. The value of this manual training not only helps the pupil to cut out and arrange with precision, but to exercise and develop his visual and mental organs. The geometrical edu-

cation he receives is invaluable in teaching him how much can be done on square and diagonal lines. Another kind of manual training is afforded by making cardboard models of solids, such as cubes, prisms of various sides, pyramids, polyhedrons, &c. Many prizes are given for this work to pupils of Marylebone, Burghley-road, and Waterloo-street schools.

Besides cardboard and paper and colour-work we see many excellent examples of woodwork, chiefly inlays for ornamental purposes, book-racks and other simple kinds of joinery, which have been arranged under the Technical Education Act. These exercises are not intended to do more than to teach the pupil the right use of tools, not to instruct him in joinery or any specific application, as such a course would be injurious to the trades. The designs for wall-papers, &c., are numerous, and many of them indicate artistic arrangements of no mean power. These chiefly are by female pupil-teachers, and we may notice as exceptionally good the following: A conventionalised treatment of foliage and flowers, green and red, by Susan Griffin, of the Nelson-street School, aged 14; a clever arrangement of squares diagonally disposed, with brown ornament, by Mabel Joeliff, of Peckham School, second-class prize; a geometrical design of ornament in squares, by Elizabeth Tarrant, Stockwell School. Jessie Phillips, of Nelson-street School, takes a first-class prize for an original design for a plate with a clever border and a geometrically designed centre; and the same school contributes a design for a hexagonal tile of neat design by Maude Bone, aged 17, and a clever conventional tile design by Amelia Gaywood, aged 15, which wins a second-class prize. Another cleverly treated tile of natural foliage and stem by Leslie Keating, of Deptford School, takes a first-class prize.

A well-arranged design for a coloured muslin natural folial treatment by Eliza Howard (Marylebone) wins a third prize; and Hettie White, of the same school, takes a third prize for a circular plaque. A panel design of natural foliage by Maude Baxter (Deptford) is awarded a first-class prize. The same prize is given to W. Kestle (Chelsea) for a cleverly-arranged tile pattern based on the octagon, well drawn, and in nice colour. Other recipients of prizes send designs of merit.

The examples of Venetian iron-work executed with only two tools, and the hammered embossed metal-work turned out by the Thomas-street School, Limehouse, under the new scheme of manual instruction, three months' work, are encouraging evidences of the value of this teaching. These latter are merely panels and plaques, the tools used on them comprising chaser, bossing tool, &c., being made by the boys. The casts include several examples of merit, amongst them we notice a lion's head, a honeysuckle frieze by H. Mitchell, Walham-street School, and several panels in relief; also several outlines from casts. The freehand drawing of this class includes an acanthus-leaf ornament by Percy Cowham, Oldfield-road School, which wins a first-class prize, and excellent work from Brackenbury-road, Gillespie, Portobello, Montam-street, and other schools. The shaded work includes clever chalk drawing of lion, a donkey, a tiger, and also from models. The brushwork without outline, sent by the Thomas-street School, is useful as an initiative stage of manual training in design. We notice one or two good designs for wall-papers are unrewarded. The perspective drawings by pupil teachers make a large display, and show decided progress. Models of horizontal steam-engines, a steam derrick, &c., praiseworthy. Altogether £50 has been awarded in prizes for drawings, and £20 for the manual class of work.

THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

THE annual meeting of the above Association is being held this week at Bury. The president is Mr. J. Cartwright, Mem. Inst. C.E., F.S.I. The members assembled yesterday in the Town Hall, kindly lent for the occasion by the Earl of Derby, K.G. At 10 a.m. there was a meeting of the Council in the Corporation Offices, Bank-street; at 11 a.m., annual meeting of members, with a reception by the Mayor, Mr. Councillor Ashworth. The annual report was read, and followed by the presentation of premiums. Mr. W. G. Scoones then moved, "That, in the view of the fact that the Association now numbers over 500 members, the

number of elected members on the Council ought to be increased from 12 to 15, and this general meeting begs respectfully to request the Council to take such steps as may be necessary to have the Articles of Association amended in order to carry out this resolution." The presidential address was then delivered, followed at 12.30 by luncheon with the Corporation of Bury, under the presidency of the Mayor. The meeting was resumed at 1.30 p.m., with papers and discussions on the "Factory and Workshops Act, 1891," by Mr. H. P. Boulnois, Mem.Inst.C.E., City Engineer, Liverpool, and "Electric Traction," by Mr. J. H. Cox, Mem.Inst.C.E., Borough Engineer, Bradford. At 2.30 p.m. the members proceeded in brakes to Fleet-street and Market-street, to view examples of wood pavement in construction. They then inspected Irwell Forge, the Lowercroft Bleach Works, the Whitehead Recreation Ground, and the railway siding in course of construction connecting the Corporation Gas Works with the main line of the L. and Y. Railway Company. At 6 p.m. the annual dinner was held in the Town Hall.

To-day, at 10.30 a.m., the following papers will be read and discussed at the Town Hall—viz., "Sewage and its Purification," by C. A. Burghardt, Ph.D., &c., Lecturer and Examiner of Owens College, Victoria University; "Rivers Pollution and Rivers Purification," H. A. Roehling, C.E.; "Utilisation of Water Power," H. G. Coales, C.E.; and "The Ordnance Survey" (with diagrams), H. T. Crook, C.E. At 1 p.m. luncheon will be partaken of with the Corporation of Bury, under the presidency of Ald. C. Brierley, J.P., Deputy Mayor. At 2 p.m. there will be visits to Messrs. Wrigley's Paperworks; the felt hat manufactory of Messrs. Lucas; the Corporation store-yard, stables, workshops, destructor, and exhibits; the Peel Mills; Messrs. Musgrave's quadruple engine working with steam at 200lb. pressure—the latest development of the steam-engine and steel boilers; and the electric light installation of Messrs. J. H. Holmes and Co., of Newcastle-on-Tyne. From 6 to 9 p.m. there will be a garden party, by invitation of Ald. John Parks, J.P., ex-Mayor.

To-morrow a visit will be paid to Bacup, where, arriving at 10.29 a.m., members will be conducted in brakes to Sir Thomas Brooks's extensive Millstone Grit Quarries at Britannia, when Mr. H. Bolton, assistant keeper in geology at the Owens College Museum, Manchester, and author of the "Geology of Rossendale," has kindly promised to give a short address on the geological features of the district. At 12.30 a.m. members will proceed by brake to "Clough Bottom" Reservoir in construction (via Bacup). At 1.15 p.m. luncheon with the Corporation of Bury, at White Lee House, "Clough Bottom" Reservoir, under the presidency of Councillor Bentley, chairman of the Waterworks Committee; at 2 p.m., inspection of the works in progress, with description by the engineer (the president), and a geological sketch by Mr. H. Bolton.

SOCIETY OF ENGINEERS.

ON the 20th July a visit was paid by the Society of Engineers to the A. B. C. Sewage Works, Kingston; the Southwark and Vauxhall Water Co.'s Works, Hampton; and Messrs. Willans and Robinson's Works, Thames Ditton.

The Kingston Sewage Works have been constructed for treating, by the Native Guano Company's processes, the sewage of 35,000 people, but with certain comparatively inexpensive additions they will meet the requirements of a population of 50,000.

At present the sewage being treated is	
that of Kingston, with a population of	27,057
Surbiton " " "	10,052
Hampton Wick " " "	2,378
Total.....	39,487

The Kingston sewage on reaching the works passes into the screening chamber and through a grating, which intercepts coarse matter likely to choke or injure the pumps, and thence through a culvert to a pump well under the main building, where it receives the "B.C." or deodorising and purifying mixture. The sewage thus partially treated is raised about 12ft. by centrifugal pumps, of which

there are three, each driven by a 15 horse-power engine, and capable of lifting 1,650 gallons per minute. The pumps discharge into a meter chamber, where the sewage is measured and the quantity registered. On leaving the meter the sewage flows along an open channel to the settling tanks, receiving on its way the precipitating agents. There are eight tanks, each 85ft. long by 50ft. broad and 6ft. average working depth, holding 150,000 gallons, or 1,200,000 gallons in the aggregate, which gives a capacity of 30 gallons per head for a population of 40,000.

The treated sewage flows in a continuous stream through the tanks, precipitating as it flows, and passes clear, bright, and odourless into a covered channel discharging into the Thames. The tanks are cleaned periodically, the deposit or "sludge" being pumped into the sludge-well by a Tangye-Holman double-action pump at the rate of 500 gallons per minute. From this well the sludge is first drawn into six sludge vessels, or accumulators, by the creation of a vacuum, and is then forced by air pressure, at 100lb. on the square inch, into filter presses on the first floor of the building, from which it is removed in hard cakes. There are three of Scott's air-pumps and sixteen of the Native Guano Company's filter presses. The pressed cakes are dried in a Borwick's drying cylinder (with fan and condensing apparatus attached), ground into powder, bagged and sold as Native Guano at £3 10s. per ton. The Surbiton sewage is separately received and screened, and is pumped by centrifugal pumps, through a meter, into the Kingston pump well. There are three pumps, each driven by an 8 horse-power engine, and capable of lifting 750 gallons per minute. The boilers are of the locomotive multitubular type, working at a pressure of 150lb. per square inch—one of 80 horse-power and two of 60 horse-power each. The two main driving engines, each of 40 horse-power, are used alternately, and, like the pump engines, are of Messrs. Willans and Robinson's patent kind. Two mortar mills are used for grinding the chemicals, which are then mixed in vats and discharged into the pump-well; and there are two vats for dissolving the precipitating agents. A small centrifugal pump supplies water from the river for the boilers, mixing the chemicals, &c.

The Southwark and Vauxhall Water Company's works at Hampton were commenced in accordance with the provisions of the Metropolis Water Act, 1852, the first supply being pumped from Hampton to Battersea, to be there filtered and distributed, on the 5th July, 1855. In 1867, additional works were commenced on the adjoining land, having for their principal object the supply of the western portion of the district, these were completed and taken into use in the spring of 1870. The details of the present arrangements are as follows:—A portion of the supply is conveyed through a 48in. conduit pipe to the subsiding reservoirs, from thence pumped by three engines of the direct-acting or "Bull" through a 36in. trunk main under a head of 135ft. to the company's works at Battersea, where it undergoes a further process of subsidence and filtration before it is again pumped to the district for distribution. Another portion is conveyed through a 36in. conduit to three filters having an area of 3½ acres. It is not usually necessary to admit water at this point, as the supply to these works is supplemented by several million gallons per 24 hours from the natural filtration works hereafter described. It is then pumped by two sets of direct-acting rotative compound engines against a head of 275ft. for delivery through 30in. and 42in. trunk mains, partly to the reservoirs at Nunhead and partly direct to the district. A pair of Cornish beam engines are kept in reserve for the supply of this 30in. main. The supply of water obtained from what is called "natural filtration" system occupies two fields and an island, having a total area of 39½ acres. The river water is admitted to these two fields through a vertical gravel filter, and the gravel subsoil is thus charged by a system of glazed earthenware pipes, 24in. diameter, laid with open joints. The water, after having percolated through the sand and gravel, is collected by a system of 24in. earthenware pipes, laid with open joints on the surface of the clay. The water is then conveyed through two 36in. conduits to the engine-house, and delivered to the filters before referred to.

THE PROPOSED STRAND IMPROVEMENTS.

AT the meeting of the London County Council on Tuesday the Improvements Committee reported upon the contemplated improvements in the neighbourhood of the Strand, the aim of which is to combine a first-class thoroughfare from Holborn to the Strand with the widening of the Strand at Holywell-street and at St. Mary-le-Strand; to open a direct thoroughfare from the north to the Strand, Temple Bar, Fleet-street, and the Embankment going eastwards, as well as for the traffic towards the Strand, Wellington-street, and Waterloo-bridge westwards; to improve the communication between the Covent-garden or Long-acre district and the Lincoln's-inn district; to open and improve one of the most unsanitary and decaying quarters of London; to offer an opportunity for a central and commanding site for a new County Hall. The estimated cost of the improvement is set down at £121,000 for work, and £1,985,000 for property, making a total of £2,106,000, which would amount to .73 of 1d. in the pound on the rates for the first year. The committee recommended that the Council should apply in the first Session of Parliament in 1893 for powers to construct a new street from Holborn to the Strand, which, it seems, is to be called "The Council Broadway," and for widening the Strand and improving Holywell-street, and for subsidiary street improvements according to the scheme submitted; that provision should be made for the construction of a subway under the new street (for mains, wires, &c.), and also for the planting of trees in the new thoroughfare; that provision should be made in the Bill that the owners of property benefited should contribute, and that, with a view to ascertain what special benefits would be conferred by the proposed improvements on the owners of property in the vicinity of them, it should be referred to the Improvements and Parliamentary Committees to report jointly to the Council on the framing of the Bill; that it should also be referred to the Improvements and Parliamentary Committees to consider and report jointly whether the limits of deviation on the deposited plans should be sufficiently wide to enable the Council to purchase property comprised in the larger schedule, and also that between Wych-street and Holywell-street, and that it should be referred to the Public Health and Housing Committee to consider and report the best mode of re-housing the persons of the labouring class who would be displaced by the construction of the new street and its approaches. After a long discussion the further consideration of the scheme was postponed till to-day.

BELGIAN PAINTINGS AND SCULPTURE AT EARL'S COURT.

AN addition has been made to the art galleries in connection with the International Horticultural Exhibition at West Kensington, mainly consisting of a series of oil paintings and sculptures contributed with the approval of the Belgian Government. The pictures include a few of architectural interest, such as "A View in Bruges," by M. Stroovant, showing the big belfry in the distance over the picturesque and piling roofs rising to the left of the canal water-way, which forms the subject of the picture. A red brick convent turret breaks the sky line on the other side, with its conical spirelet, and beyond is a stone-built loggia at the water's edge, midst a quaint group of oriels, gables, and shutter-furnished windows. M. Vanderheest shows a riverside view from Dinant, with the bright-coloured restaurants on the quay. In the background over the Meuse appear the wooded slopes of the hills beyond. A church side altar (892) by M. G. Vanaise is interesting as a specimen of dignified Renaissance work rigidly confined within strictly dominating architectural lines. The reredos is all gilt, with paintings of sacred subjects in the panels, and the richness of the composition is set off to advantage by the plain wall-surface of the return wall of the chapel. The old men in the picture add scale without being too much in evidence. As a contrast to this last is the life-size study by M. A. C. Clayenar of a nude girl prostrate on a bear-skin mat by the side of a marble fountain. The foreshortening of the figure is skilfully managed, though the idea of the pose is essentially French. A softly-painted seascape by

Bouvier attracted our notice for the brilliant aerial effect of the sunshine behind the clouds, and David Oyens' "Corner of a Studio" exhibits a solid handling of bold and varied colourings massively treated, notwithstanding the crowded arrangement of the subject. M. Jacs Carabain shows a view in Italy with a familiar campanile in the background. A white bronze bust of St. George, by Ch. Vander Strappen, deserves mention for the picturesque arrangement of the accessories and capital modelling of the head. Ruth "Gleaning" is a statuette of merit, by J. Willens, in red bronze, and other examples deserve naming, such as a sleeping girl holding a violin, by De Viques. Wolfers, Mignon, Meunier, and Samuel are among the other sculptors. M. Conrad Dressler, in the adjoining gallery, shows an heroic statue of a gladiator wrestling with an octopus, and the same artist sends a bust of H. M. Stanley, and another of the late Father Mackonochie in Cassoch and Biretta. The Right Hon. A. J. Balfour, M.P., is represented by Mr. E. V. Williamson, of Esher, and Mr. H. T. Margetson exhibits a bronze bust of Mr. Maurice B. Adams, F.R.I.B.A. The late Lord Beaconsfield is modelled by M. E. E. Geflouski, and a group in terracotta, called "There's Father," is by another foreign artist. We may name, in conclusion, an exceedingly graceful statuette of a girl holding a mirror (292); but no particulars of the author are given.

THE DICTIONARY OF ARCHITECTURE.*

AFTER a long intermission we have received the concluding part of this Dictionary, which has been dragging through a lengthened period of 40 years, and has outlived, in the course of its preparation, all but six of the original gentlemen who formed the committee of the Architectural Publication Society, which was initiated by Mr. Wyatt Papworth. That committee included some of the leading architects of the day, and comprised Samuel Angell, Arthur Asphitl, Sir Charles Barry, R.A., Ewan Christian, Professors Cockerell and Donaldson, T. Hayter Lewis, William Tite, F.R.S., Sidney Smirke, R.A., and many more. Upon Mr. Wyatt Papworth, whose learning, patience, and devotion have been called into requisition, has devolved the labours of compiler, editor, and reviser, and we can say these duties have been most faithfully fulfilled. The original intention of completing the Dictionary in three years may be mentioned to show how far wrong in their calculations the committee were, and how futile is the attempt to produce a Dictionary of Terms in so short a time. The interesting facts in connection with this undertaking brought together by Mr. Arthur Cates in his *Retrospect*, whose labour as one of the committee of revision, and as hon. secretary since 1858, demand recognition, are worth perusal. The list of contributors include many eminent members of the profession, several of whom have not survived the completion of the work, and here we cannot but regret that so much valuable information and labour has been expended in a work that must be admittedly, from the lapse of time, very imperfect and wanting in the essential of being "up to date." Very many new terms that might have been included in the text are necessarily not to be found, and articles on archaeology, scientific application, and manufacture cannot but be incomplete in the earlier parts.

The part before us, XXIII., comprises the letters T—Z, and the title page, contents, and list of subscribers. The number of letters included renders this part a valuable one. The number of terms under "T" are considerable, and comprise several important architectural subjects. "Tabernacle," one of the first, gives the Latin, Spanish, French, and German equivalents, such as *sacrarium*, *ciborium*, *custodia*, and *sakramentshaus*, the latter the German name for receptacle for the consecrated Host. Besides a condensed description of the various forms of tabernacle used for the Blessed Sacrament in different countries, as a cupboard in the wall, a ciborium as used in France, and the English mode of suspension, as by a dove with canopy or a standing receptacle or tabernacle of stone or metal on the altar, as at St. George's, Southwark, the article notices some of the chief artists, and gives a list of dated examples. The *Building News* (Walcott), 1873, is referred

to. Under "Tank" various kinds are described, as the *koodh* of India, and various references will be found to rainfall and farmyard tanks, Robert's "rain-water separator" being mentioned, and under this head reference is made to our pages Vol. 1875. Tar pavements receive notice, and their composition is given. The biographical notices include several Taylors. John Taylor, M.A., F.S.A., designed the stations on the Chatham and Dover Railway, and new buildings at Roupell Park, Brixton. His patents for damp-proof course and roofing tiles are well known. Sir R. Taylor receives a long notice of his works. Very inadequate is the article on "Technical School," which, like many others, only refers to treatises, without any explanatory particulars of plan or requirements. Information on these points, with a few typical plans, would have been of value. The arrangements of Egyptian, Greek, Roman, and Indian Temples are more fully described. Many articles are only bibliographical notices, and some of these might have been omitted to make room for extended articles on subjects of daily requirement. We think the merely dictionary definition has been carried too far in many instances, as, for example, in "Tender," "Tenement," "Tenon," "Tensile Strength," "Tension," "Tenure." Terracotta has nearly four columns devoted to it, and the writer refers to Mr. A. Waterhouse's, Natural History Museum, the Constitutional Club of R. W. Edis, besides references to our pages and other treatises. A list of early examples is given, but we do not find any mention of the late improvements in the manufacture made by Messrs. Doulton. Testing is fairly treated, though several important facts and improved appliances are unnoticed. Under "Theatre" the names of ancient writers on the subject are given, the principal modern theatres and opera houses are enumerated; but no description of the requirements of a modern theatre, nor any data as to entrances, corridors, or stairs, as now required by by-laws, are given, an omission certainly. The same bibliographical fulness accompanies the subject "Thermæ," but we do not find any reference to modern baths. Thirteenth Century architecture is confined to the names of lectures, such as Scott's, and to papers read and reported. Some valuable particulars are given of tile pavements and walls. Timber is treated and the leading authorities quoted. Under timber-building is described buildings entirely of this material, and the book references are pretty complete; but no mention is made of modern work. The word "Tower" does not receive the attention it deserves, nor can we say that Tudor architecture is representative of the period, as it deals only with the reign of Henry VII. The letter "U" occupies only a few pages. Vault and vaulting are fully treated. Venice is comprehensively described, and a list of churches, palaces, and other buildings and a full list of books and views accompany the article. Under "W," the articles on water service, workman, Wren are comprehensive; but "workhouse" and "window" are too briefly dismissed. We have only selected a few typical names out of the many hundreds, some of them of very minor interest, that appear in this voluminous work. A vast amount of literary labour of a bibliographical kind has been expended, and the biography and topography have received a large share of attention, perhaps more than their importance in a work of this nature deserves. On the whole, the Dictionary will be invaluable as a work of terminology, despite the shortcomings in many of the articles devoted to special classes of buildings and details. On referring to any given subject the student will find a list of books and papers, and references to professional journals, where further information can be gathered, and this index-value of the Dictionary is no small boon to the architect, antiquary, and student.

LOFTY BUILDING CONSTRUCTION.

THE great pressure arising from the weight of the lofty buildings erected in Chicago is distributed and equalised by grillages or platforms made of several layers of steel beams embedded in concrete, thus obtaining a great projection of the footings with small depth. The soil is clayey, but underlaid in some parts by rock. In the construction of the buildings, General Smith, M.Am.Soc.C.E., speaking of those lofty structures, objects to the iron or steel framework used for supporting the floors, and

afterwards clothed with walls of brick or stone, and recommends instead masonry for the columns and walls; and in order to reduce their thickness, he proposes to "build them of blocks of the strongest stone" (he cites experiments with Lemont limestone), "laid on their natural bed with bearing surfaces planed perfectly true, and simply washed with a thin grout of Portland cement." The column blocks, he suggests, might be doweled together by a steel rod running through their centres, connecting cast-iron cap plates at the level of each story. To protect the limestone pillars, he proposes to cover them with a newly-invented fireproofing 2in. thick, which is such a good non-conductor that, it is said, when brought to a white-heat on one side, the hand may be held against the opposite side without any unpleasant sensation. On these pillars groined arches or domes would be built, thus avoiding iron floor girders, and reducing iron or steel to a minimum. The chief objection to the steel skeleton framework is the expansion and contraction of the metal when exposed to fire, and the tiles used to cover the steel columns is liable to crack off as the columns expand. On the other hand, it is alleged that the substituted stone columns is quite as dangerous as those of iron, and the arched flooring will be liable to thrust, especially if the columns are widely spaced. We are inclined to the opinion that the success of stone columns protected would greatly depend on the resistance of the protective covering to fire, and that the same protection would afford quite as much security to the iron or steel structure.

BOOKS RECEIVED.

The Future of Palestine, by CLAUDE REIGNIER CONDER, D.C.L., LL.D., Major R.E. (Palestine Exploration Fund, Hanover-square, W.), is a lecture delivered for the Palestine Exploration Fund by the author, who, in alluding to the geographical position of Palestine, which is unchanged, and possesses the same advantages it once did, there being still a range of 10,000ft. from Hermon to the Dead Sea; with varying climates and products, says "the situation, which made Palestine an emporium of the trade of all the Levant when Ezekiel wrote, may again render it the centre of a busy commerce when its resources have been developed by modern science." There is still absence of good harbours. The author is still hopeful, and thinks that the future will see the gradual increase of agricultural population and prosperous settlements, and he thinks the presence of the Turks will not forbid such progress, though it may place obstacles in the way. This improvement will, he believes, not be due to the schemes of individuals, but to the communication of man with man among the humbler classes of Jews and Christians. We recommend a perusal of this brochure.—*Society of Engineers—Transactions for 1891*, edited by G. A. PRYCE-CUXON, secretary (London: E. and F. N. Spon).—In addition to the inaugural address by William Newby Colam, president, which is an interesting summary of engineering progress and discovery, there are several papers of engineering interest. One of these is Mr. G. M. Lawford's paper on "The Drainage of Town Houses," which is awarded the president's premium. We do not agree with the author when he recommends 4in. drains laid at a uniform gradient of 1 in 60, aided by automatic flushing, for all cases, nor do we think that separate cisterns for closet and domestic use are unnecessary, even with valve-closet arrangements. Perfection in these cannot be insured. The paper is worth reading, and is illustrated. The Bessemer premium is given to Mr. J. H. Paul's paper on "Corrosion in Steam Boilers," and the Society's premium to Mr. J. Kerr's paper on "Portable and Pioneer Railways." Other papers include one on "Modern Coal Manufacture," by C. C. Carpenter, "The Balancing of High-Speed Steam-Engines," by Arthur Rigg, &c.

On Saturday two foundation-stones of the new Technical School at Holmfirth were laid. The new school will contain rooms in which chemistry, dyeing, weaving, and designing will be taught, and there will also be provision for the teaching of elementary art. The total cost of the building and fittings will be about £3,500. The architect is Mr. J. Smith, of Sheffield and Holmfirth, and the style of architecture Domestic Gothic of the fifteenth century.

* Part XXIII., T to Z. London: 9, Conduit-street, Hanover-square, W. Arthur Cates, Hon. Sec.

CONTENTS.

Which Way to Steer	97
The Block and Quadrangle	98
Decorative	99
Land Surveying and Levelling, and the Testing, Adjustment, and Use of Mathematical Instruments	101
The Liverpool Water Supply	101
Art Exhibition of the London School Board	102
The Incorporated Association of Municipal and County Engineers	102
Society of Engineers	103
The Proposed Strand Improvements	103
Belgian Paintings and Sculpture at Earl's Court	103
The Dictionary of Architecture	104
Lofty Building Construction	104
Books Received	104
Our Illustrations	105
Competitions	105
Archæological	105
Architectural and Archæological Societies	105
THE BUILDING NEWS DIRECTORY	XIII
Wayside Notes	124
Building Intelligence	124
Brickwork	125
Railway Charges and Expenses	125
Correspondence	126
Intercommunication	126
Legal	126
Legal Intelligence	126
Statutes, Memorials, &c.	129
Our Office Table	129
Water Supply and Sanitary Matters	130
Trade News	130
Tenders	130

ILLUSTRATIONS.

"PLEASURE," BY W. REYNOLDS.—"WHEN THE WORLD WAS YOUNG," BY EDWARD J. POYNTER, R.A.—"ROSA MYSTICA," BY J. R. SPENCE.—DESIGN FOR CHRIST CHURCH CATHEDRAL, BRITISH COLUMBIA.—CAER-HUN, NORTH WALES.—COATS MEMORIAL CHURCH, PAISLEY.—DESIGN FOR OXFORD MUNICIPAL BUILDINGS.—CONSTRUCTIVE DETAILS OF AN IRON FOOT-BRIDGE.

Our Illustrations.

DECORATIVE PAINTINGS FROM THE ROYAL ACADEMY AND THE NEW GALLERY.

THE reproductions of these eminently interesting pictures are taken of photographs directly produced from the originals. We are indebted to Major Joicy for permission to illustrate Mr. E. J. Poynter's beautiful painting, entitled "When the World was Young," and our thanks are due to Messrs. Cassell and Company for the use of Messrs. Dixon and Son's fine photograph, which the painter kindly placed at our disposal. Of the grace and harmonious colouring exhibited in this masterly work little need here be added to the world-wide approval which has been accorded to it. To the architect particularly, Mr. Poynter's interiors are always interesting. "Pleasure," by Mr. W. Reynolds-Stephens, presents maternal joy and childish delight in the prow of the craft and love reposing in the stern, the whole composition being treated in delicate tints, redolent of summer and the heyday of life, as the calm waters of the peaceful lake reflect the brilliancy of the passing day. "Rosa Mystica," or Santa Maria Vergini, by Mr. J. R. Spence, is a dignified example of strictly decorative painting from the New Gallery Exhibition. The Heavenly Guardians of the Blessed Lady add aerial effect as they hover above in united guardianship over the Christian Throne, behind which a wealth of roses give colour to the setting and illustrate the legend.

CHRIST CHURCH CATHEDRAL, VICTORIA, BRITISH COLUMBIA.

THE exterior of this design was published, with a plan of the building, in our issue for June 3rd, and our illustrations of the other designs were given on May 27th, June 10th, and June 24th last. "Ars" and "Old and New" were, it will be remembered, two of those chosen by the referee for the final choice, which, as yet, has not reached us. "Duomo's" design is marked by a degree of originality which gave the composition a prominent place in the contest, and we considered it worthy of the third place. The inferior now given affords several reasons for this conclusion.

CAER-HUN.

THE subject of our illustration is a view of a residence placed in a most charming situation on the banks of the river Conway. The original building, although old, was quite uninteresting from an architectural point of view, having fallen into a very dilapidated condition, being patched up from time to time, and finally rough-cast externally. The portion to the left, in-

cluding the main entrance, is entirely new, the lower portion to the right being what was left of the old arrangement, which has been renewed and recessed externally. The work will be carried out for Mrs. Hemming by Messrs. Thos. M. Lockwood and Sons, of Chester.

COATS MEMORIAL CHURCH, PAISLEY.

WE illustrate the Entrance Front of the Coats Memorial Church at Paisley, N.B. Mr. Hippolyte J. Blanc, of Edinburgh, is the architect.

OXFORD MUNICIPAL BUILDINGS.

ALL the five designs submitted in the ultimate competition for this important work have been illustrated during the past fortnight in the BUILDING NEWS. We now add a copy of the perspective submitted by Mr. Charles Bell, F.R.I.B.A., showing the grouping and general massing of his design, which depends greatly for its effect on the recessing of the town-hall in the centre of the façade, after the fashion adopted by Street in the Strand front of the Law Courts, for the position of the great central hall.

CONSTRUCTIONAL DRAWINGS.—V.

THIS double-page of details of a timber foot-bridge, comprising elevation, plan, and details, is complete in itself, and requires no further explanation.—STUART H. DAVIES.

COMPETITIONS.

KNUTSFORD.—At their last meeting the Altrincham board of guardians accepted the plans submitted by Mr. Robert J. McBeath, architect, of Sale, in a limited competition, for the enlargement of the above buildings. The work, which will shortly be proceeded with, comprises new chapel and dining-hall, kitchen, stores, &c., and rearrangement and improvement of the offices.

NEW SUNDAY SCHOOLS, JOHN-STREET CHAPEL, W.C.—At a meeting of the trustees, held on the 18th inst., the design submitted by Mr. F. T. W. Goldsmith, A.R.I.B.A., of 1, Verulam-buildings, Gray's Inn, W.C., and marked "Robert Raikes," was selected, and a premium of £5 5s. awarded to a design by Messrs. Keene and Drake, of 41, Bedford-row, W.C., which was placed second in the competition.

SOUTH AFRICA.—The municipality of Cape Town have awarded the premium for the best design of a quarantine hospital for infectious diseases to Mr. Wm. Henry Reid, architect, of that city, formerly of Plymouth, Co. Devon, and London, England. The cost is estimated by Government at £13,000. Details will be given hereafter.

TOTTENHAM.—The Bethnal Green Guardians have decided the competition for the erection of the proposed new workhouse at Tottenham. They have placed Messrs. Giles and Gough's design first, Messrs. Newman and Newman's second, and Mr. Aldwinckle's third.

WALSALL.—Thirty-nine designs have been received for the suggested new town-hall here. It is not proposed to put them on view to other than members of the council, nor it is proposed to employ a professional referee. The council will be aided in their decision, so the town clerk informs us, by the advice of their own borough surveyor, who is a trained architect.

CHIPS.

THE Mersey Docks Board at their last meeting granted the superintendent of their works, Mr. Fielden Sutcliffe, an increase of salary from £350 and £50 bonus to £600 a year.

On Monday afternoon the foundation-stones of the new municipal buildings and free library—which are to be erected in West Ham at a cost of about £30,000—were laid by the Mayor and ex-Mayor.

Mr. H. C. Marks, Assoc.M.Inst.C.E., borough engineer and surveyor of Dewsbury, has recently received two additional appointments, accompanied by a substantial increase of salary—viz., that of water engineer to the Dewsbury corporation and engineer to the Dewsbury and Heckmondwike waterworks board. This latter authority supplies water to the boroughs of Dewsbury, Ossett, and Barnsley, and the local board districts of Heckmondwike, Soothill Nether, Ravensthorpe, Skelmanthorpe, and Flockton.

ARCHÆOLOGICAL.

ROMAN RELICS AT WALLSEND.—A number of interesting relics, dating from the Roman period, have recently been discovered on the land leased by the Corporation of Newcastle to the inhabitants of Wallsend on the small allotments system. Recently a Roman altar, well preserved, a man's head in profile on a plain slab, a square stone with corniced sides, evidently the pedestal of a column, and other fragments, were discovered near the surface. These have been supplemented during the last few days by the discovery of other remains of equal interest. One represents a Roman warrior in a reclining posture, with the figure of a goat on his left. The head of the warrior is missing, and the right arm is wanting below the elbow, the stone upon which the figure is cut being broken in several places. Mr. Blair, hon. secretary of the Newcastle Antiquarian Society, has examined the relic described above, and made a drawing of the figure; but since his visit to Wallsend another carved stone has been found by Mr. Harbottle in close proximity to the place from which the relics previously referred to were excavated. The latest "find" consists of several moulded stones, fragments evidently of a shattered altar. Several pieces to be missing; but 24 letters can be distinctly traced. Nearly the whole of these relics have been found near the same spot at a point distant about one hundred yards from the line of the Roman Wall. Mr. Harbottle, the tenant of No. 17 plot, declares that some nine inches below the surface his allotment is traversed by the foundations of two broad walls, one running from west to east, and the other from north to south. The stones lie in tiers, and are of uniform size, the larger forming the lower layer. A good deal of interest has been taken in the finding of the relics, and several of the allotment holders have expressed their intention of digging in quest of buried treasure in the autumn.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

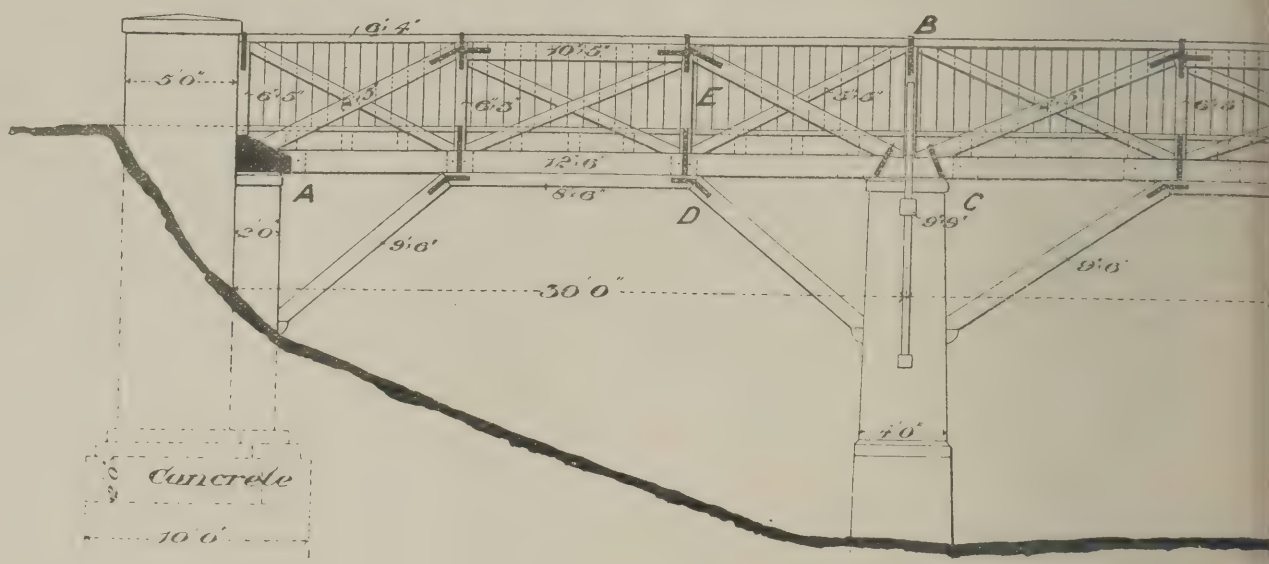
KENT ARCHÆOLOGICAL SOCIETY.—The members of the Kent Archæological Society commenced on Tuesday a two days' visit to Dover. At the preliminary general meeting, held in the town hall, Earl Stanhope occupied the chair. The members proceeded to view the old Church of St. Mary, where an explanatory paper by the Rev. Canon Puckle was read. Dover Priory was next visited, and, after luncheon, the Castle, the Roman pharos, and the ancient Church of St. Mary's in the Castle were viewed. In the evening Earl Stanhope presided at a dinner in the town hall, and papers were read. The meeting was brought to a close on Wednesday in most unfortunate weather. The early part of the day was spent in exploring the antiquities, chiefly Roman, which have been discovered around Dover, and are preserved in the local museum. The principal place visited was St. Radigund's Abbey, an interesting ruin near Dover. The Rev. G. Livett, Precentor of Rochester Cathedral, acted as guide. The abbey is supposed to have been founded in the 12th century. With the exception of the part used as a dwelling, the greater part of the abbey, including the chapel, is in ruins.

Dr. Ransome, of Manchester, who has just sailed for the Canary Islands, has taken one of Messrs. Baird, Thompson, and Co.'s well-known patent "Grahtrix" drain test machines for the sanitary survey he is to make whilst there.

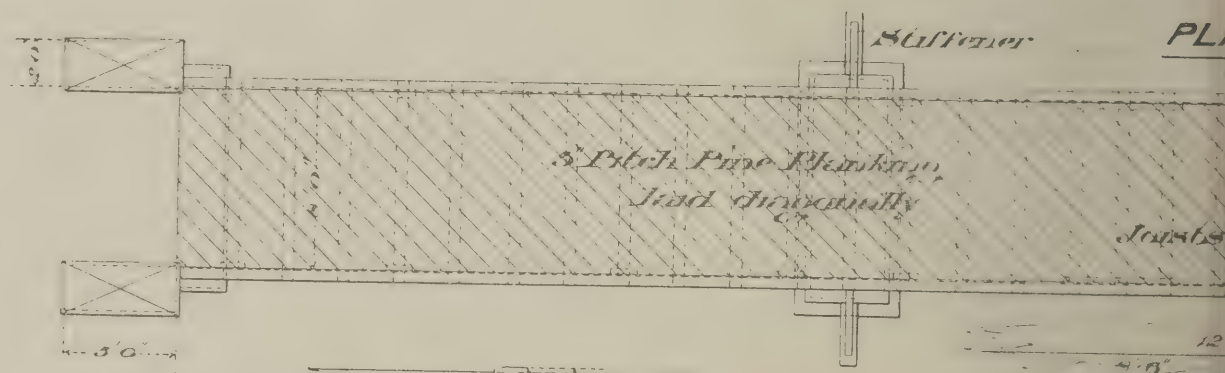
At the monthly meeting of the Cardiff rural sanitary authority, held on the 13th inst., the building bylaws for the whole of the district of the authority, as amended by the Local Government Board, were agreed to. The bylaws for the regulation of slaughter-houses in different parts of the district were also approved. The surveyor to the authority, Mr. Wm. Fraser, Assoc.M.Inst.C.E., &c., presented plans for the drainage of Ely at a cost of £1,000, which were handed over to a sub-committee.

During the year 16 Methodist chapels have been built, 78 have been enlarged or altered, 12 schools and 3 ministers' houses have been erected. These have cost altogether £40,195, of which sum £24,922 has been raised, in addition to which £24,656 has been paid off from existing debts, making a total raised for chapel purposes of £50,233. The amount spent by the denomination on chapel property from the commencement to the end of last March was £2,109,744, and the present debts amount to £400,000.

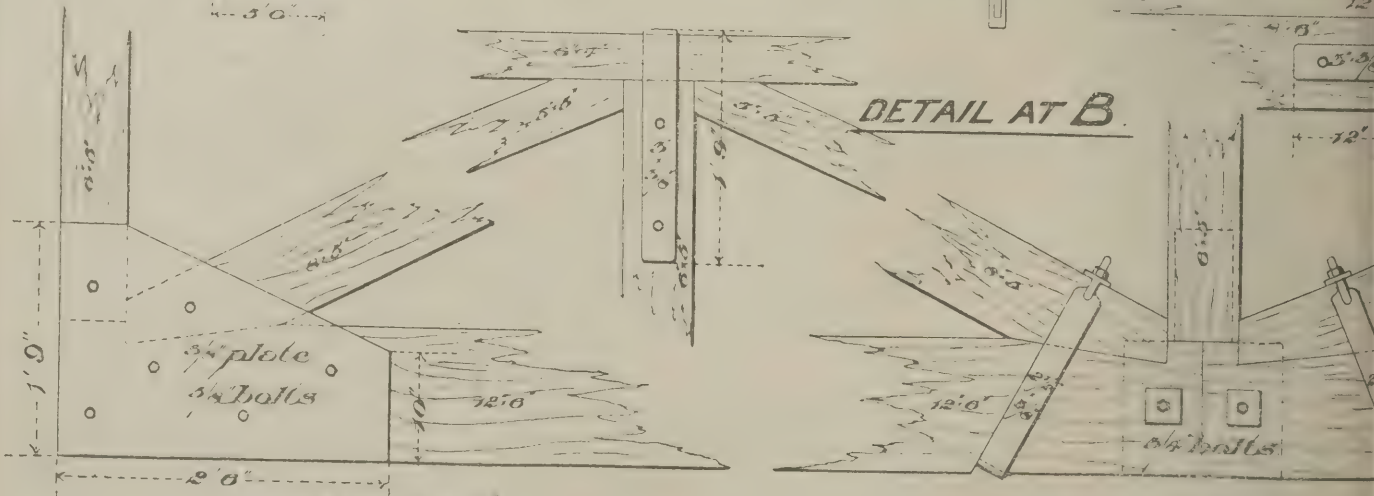
CONSTRUCTIONAL DRAWINGS - N^o.5 - DETAILS OF A TIMBER



ELEVATION



PLAN

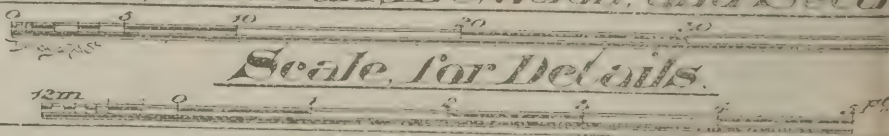


DETAIL AT A.

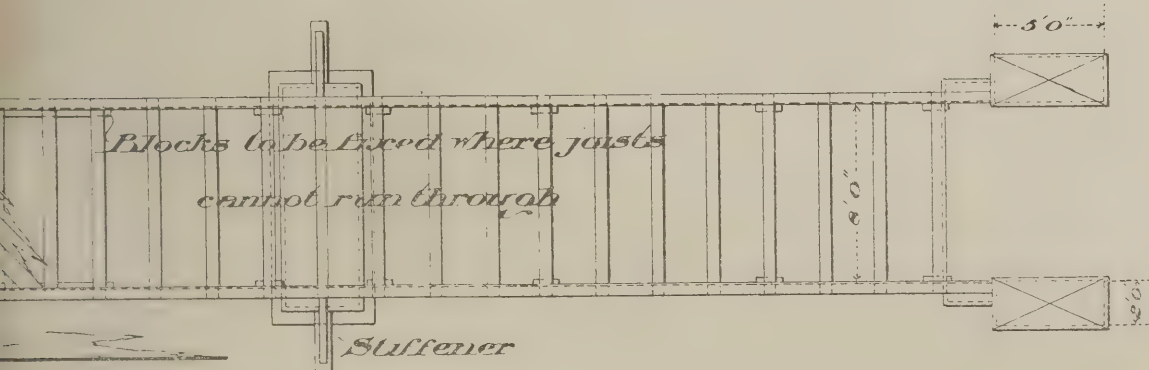
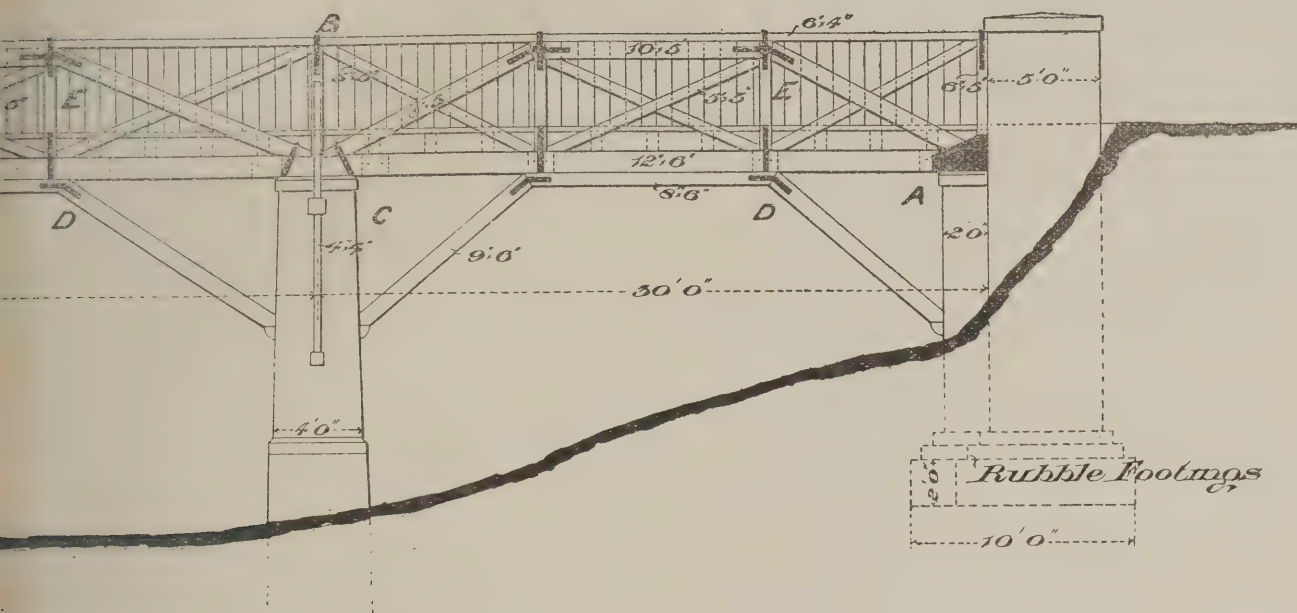
DETAIL AT C.

Scale, for Plan, Elevation, and Section

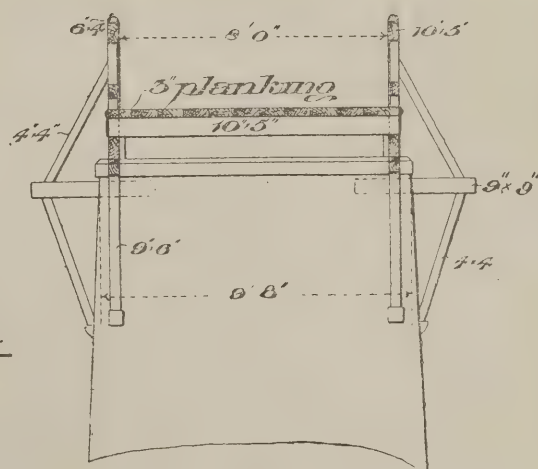
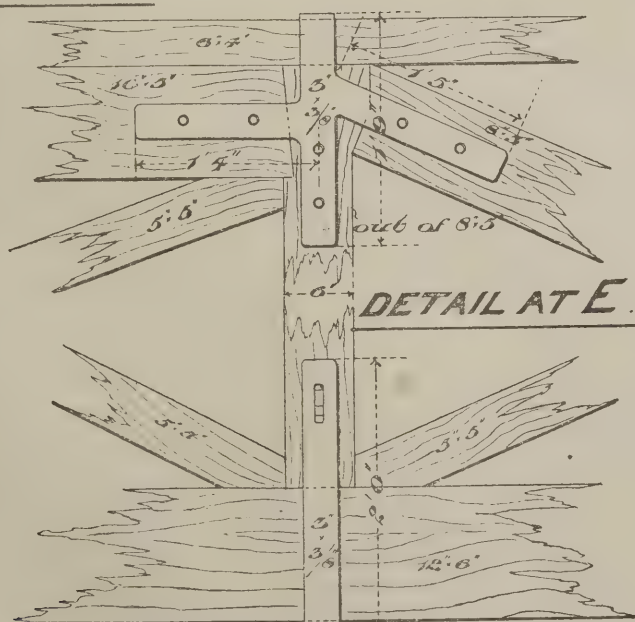
Scale, for Details



OTBRIDGE.



DETAIL AT D.



SECTION.

Stuart H Davies del^t.

WAYSIDE NOTES.

I SHALL really soon become quite enthusiastic about our Progressive County Council. We have only just heard of the proposal to construct a new street between the Tower Bridge and Bricklayers' Arms when the old-standing scheme for Strand improvements is brought forward by the Council's Improvements Committee. This is the sort of progress that one can appreciate. Music for the masses, and like matters, excellent as they may be, and quite the thing for municipal councils, are all very well, but certainly much more so the care of London as a collection of buildings, streets, &c. It is some little surprise to me to see how early the Council has tackled this matter of the Strand improvements, for one was rather prepared for another municipal lodging-house, some scheme for free refreshment for the masses in the parks, or the better administration of tramway property. Here we have it, however, in black and white, that the Council has turned seriously towards the consideration of the much-needed reformation of existing arrangements in the neighbourhood of Holywell-street, and in the way of making better communication between Holborn and the Strand. Bolder still, the Council proposes, or speaks about, a new county hall, "suitable to the Municipality of London"—a genuine "long-felt want."

Of course, the betterment idea is still in the mind of the Council, who stick to the principle with a pertinacity worthy of the cause. Some encouragement has been given to the sticklers for this betterment clause by the result of the General Election. It is hoped that with a Gladstonian Government in power more sympathy with the principle will be shown in the House of Commons. This, I should say, is but a slender reed to lean upon. Blessed is he who expects nothing from Mr. Gladstone. There is, moreover, considerable difficulty in demonstrating how the parties are "bettered." How, for instance, are the Strand shopkeepers to benefit by either one of the proposed improvements? There is nothing to show that a single additional purchaser of any kind of ware will be caused to pass along the Strand by any widening operation. It is not even certain that a holder of property on the north side of Holywell-street would be greatly benefited by the destruction of the block of houses that cuts off the Strand. I should say that the people really "bettered" will be the omnibus companies and other owners of vehicles, cabbies, and all the miscellaneous drivers of vans, carriages, and carts, together with the general stream of pedestrians, all of whom will find it decidedly better when there is more driving-way and elbow room.

If the scheme goes on, I expect that we shall hear a good deal more about the two churches. As a matter of fact, a councillor at Tuesday's meeting alluded to St. Mary-le-Strand as "a church unworthy of preservation," so that all the talk and writing attending the recent discussion about this building has not converted everyone into an admirer of St. Mary's. There are certain to be several coming forward with proposals to destroy both it and St. Clement Dane's. There will be much talk—probably it will be all talk. We have now so frequently seen this question of improving the Strand brought forward only to be set aside again, that one is inclined to doubt the seriousness of any fresh proposal on the subject. There was much antagonism to the scheme evidenced at the discussion, many speakers taking exception to the position of the point where the proposed new thoroughfare is to join the Strand. Time enough yet for a name for this new street; but I quite agree with Dr. Longstaffe, that "The Council Broadway" is, for more reasons than one, a ridiculous proposal.

If the South-Eastern Railway Company are going to rebuild London Bridge Station in a thorough manner, the old shed now used for fruit traffic and for the despatch of children's excursions will be demolished. Here, then, is the opportunity for students of early railway station architecture! The building is the original terminus of the London and Greenwich Railway, the company for which was incorporated in 1833, and the line, something under four miles in length, and costing a million pounds sterling, opened for traffic on the 28th of December of the

same year. On this line, says a guide book to the railway published about the period of its opening, the public may be conveyed on at the rate of twenty to thirty miles an hour, "a velocity almost incredible." It is not unsuitable that this old station should be still in existence on a line of "flying Watkins." It appears that the present shed represents only a portion of the original station, the remainder having presumably been demolished in the construction of the high-level station. The improvements now being made are on the north side of the station, and we may really hope at last that the wretched old felted sheds will give place to the iron and glass structures of the new platforms that have been provided. It is extremely doubtful, however, whether the original building will disappear so long as it holds together over the baskets and boxes of foreign fruit that daily encumber the platforms, and the occasional bands of holiday-making children that may be seen in the summer months.

Bell-ringing appears to have partially destroyed the tower of the old parish church at Great Chishall, Essex. A large part of the massive wall of the tower fell in with a loud crash at an early hour on Tuesday morning. It is said that signs of lateral expansion of the tower had lately been noticed, and on the day previous to the accident a survey had been made with a view of removing the peal of bells, left hanging in a dangerous position after the fall of the wall. Other causes may have been at work, but it looks like a case of bell-ringing bringing down a tower. As a rule an old tower will stand any amount of bell-ringing, where that of a modern competition church would come all of a heap at the first peal.

Very interesting is your account of "An Architectural Tour in 1634." It appeals strongly to one's imagination. The fact that Norwich so early produced tourists interested in architecture is in accord with what one would expect from a city so full of fine old buildings. It would give even a military captain, lieutenant, and ensign a taste for architecture to live in such a place, so we can understand their enthusiasm. I am sure that your readers will look with much interest for a further account of those early travelling students.

An account of an architectural tour quite in the Middle Ages we scarcely hope ever to come across. We have everything to show that such a thing was practically unknown. Yet it would be of wonderful interest to us. We might have some account of the operation of building edifices now crumbling into dust, and obtain much light upon the manners and customs of the builders of those days. It is true that if an architect were recounting his adventures, he might—if there were anything in common between architects, ancient and modern—speak only of edifices old even in his day, and omit to mention the work of his contemporaries. If we reflect a moment, we see how in writing about our modern architectural tours, it is the exception to mention contemporary work. As a rule, the architect seems to greatly prefer writing about ancient buildings rather than about modern ones. It may have been "ever thus," and a writer of the Middle Ages would perhaps have written of the earliest work only and ignored that which was contemporary; in which case, where we might have expected accounts of building a Salisbury or Lincoln Cathedral, we should only be treated to an archaeological disquisition on, say, Norman or Saxon work.

GOTH.

Sir Frederick Bramwell has been appointed by the Board of Trade to act as arbitrator to assess the amount payable by the Council for the purchase of the whole undertaking of the London Street Tramways Company, authorised by their Act of 1870. The inquiry will be opened on Wednesday, the 27th inst., at the Surveyors' Institution, Westminster, but it is understood that the first meeting will be one of merely a preliminary character.

The foundation-stone of stores and offices for the Pembroke Dock Co-operative Society was laid on Saturday last. The building has frontages of 53ft. and 60ft., and includes three large shops, extensive offices, and store-rooms. It is being constructed with Ruabon bricks and Bath stone dressings. Mr. H. Cartwright Reid, of Pembroke Dock, is the architect; and Messrs. W. Davies and Son, of Tenby, have the contract for its erection for £2,700.

Building Intelligence.

LEAMINGTON.—The new wing of the Warneford Hospital, Leamington, has been opened. The recent alterations and additions to the hospital consist of a new wing or ward pavilion, operating room, new sanitary block to old house, additions to the Home for Nurses, re-drainage of old house, and new hot-water supply; and the whole work has been carried out from the plans and under the active superintendence of Mr. Keith D. Young, of London. The new ward pavilion consists of a building two stories high above the basement. On the ground floor is a porch entrance for accidental cases; to the right of the entrance is the corridor leading to the old house, with a staircase leading up to the first floor and down to the basement. In the well of the staircase is a hydraulic lift. Immediately facing the entrance is a corridor leading to the new operating room. To the left of the entrance, a short corridor gives access to the ward and its offices. The two small rooms to right are stores for patients' clothes and ward linen respectively. To each patient is allotted a floor space of about 124ft., and a cubic space of about 1,605ft. The hydraulic lift was erected by Messrs. Archibald Smith and Stevens, of Janus Works, Battersea. The mosaic paving is by Messrs. Burke and Co., of 17, Newman-street, W.; and the staircase ironwork is by Messrs. Richardson, Ellison, and Co., of Brownlow-street, W.C. Mr. E. Atkins was the clerk of the works.

LEEDS.—A desirable improvement is about to be carried out at the corner of Guildford-street and Park-row, Leeds. The old structure is now being demolished, and in the course of a fortnight building operations will be commenced. Designs have been prepared by Mr. Edward J. Dodgshun, F.R.I.B.A. The building will be of the same height as that which it adjoins in Park-row. The sky-line, however, will be broken by two lofty ornamental gables, the tips of which will be some 74ft. from the ground. The frontage to Park-row will be 45ft., and to Guildford-street 33ft. The style is Renaissance, one of the leading features being a turret at the corner, surmounted by a lead dome. The building will be of four stories, and the whole of the accommodation will be devoted to offices.

NORTHBORO'.—A movement is on foot for the restoration of the ancient church of St. Andrew in this village. Mr. G. C. W. Fitzwilliam, of Wilton House, who is joint lord of the manor with the Dean and Chapter of Peterboro', has undertaken the restoration of the transeptal chantry, which contains monuments of the Claypole and Cromwell families, one tomb being supposed to be that of Oliver Cromwell's widow, who died at the ancient manor-house here in 1665. The church is chiefly of the Decorated and Perpendicular periods of Gothic, with traces of Norman and Early English, and consists of chancel, nave with clerestory, aisles, south chantry or transept, south porch, and a singularly lofty gable bell-cot at the west end, supported by tall flat buttresses of the 12th century, and the very fine transeptal chantry before mentioned. There are but few places in England which contain anything so interesting and unique as the remains of the manor house of Northboro', built by Geoffrey de la Mare in 1340, now the property of Mr. Fitzwilliam. It was long the residence of the Protector's favourite daughter, Mrs. Claypole, who died there, though buried in Henry VII.'s chapel at Westminster Abbey.

WOLVERHAMPTON.—On Monday the foundation stone was laid of the institute which is being erected in St. Peter's-square for the use of the parish of St. Peter. The buildings will be two stories in height, and contain on the ground floor classrooms and retiring-rooms, and, above, a large room 67ft. 6in. by 32ft., for assemblies and meetings. The structure is in the Late Domestic Gothic style, and will be built of red brick, with Codsall stone dressings, and covered with slates. The cost of the portion now being erected will be £2,500, exclusive of the fittings and furnishing. Mr. H. Lovatt is the contractor, and Mr. T. H. Fleeming the architect.

Mr. F. Madox Brown is engaged in superintending the scenery, costumes, and decorations required for the representation of "King Lear," the next in Mr. Irving's series of Shakespearian dramas.

BRICKWORK.

IN some of the ruder kinds of early masonry bricks were often employed as mere lacing or stringcourses, to bind together at varying vertical heights the whole of the underlying constituent parts of the masonry; and when so used in the construction of arches (as at Brixworth) in combination with stone, the object of their use with the builders seems to have been to obtain even and equal bedding planes here and there throughout the arch by the insertion, as it were, of bricks or brick courses, irregularly alternating with the rough, unworked, or rudely "scraped" stones of uneven beds, chiefly composing the body of the arch. Bricks are still sometimes so employed, and as inclosures to flint diaper-work, but more in the capacity of ornamentation, and as units or scales of a known dimension to aid the eye in the realisation of the extent and effect of the composition as a whole, than as parts of constructive necessity.

In modern work some of the greatest achievements of engineering skill have been carried out chiefly in brickwork, and in some instances almost to the entire exclusion of the aid of stone. This being so, it will not be out of place to consider the essential conditions of what is now universally accepted as being worthy the name of good brickwork. In the first place, brickwork has made rapid and well-marked strides in the last quarter of a century, or since the decadence of the stuccoed front, and the revival and use of red bricks and terracotta under the sympathetic and able advocacy of our architects and masters of modern refined thought as applied to architecture. Prior to the time mentioned, the shuff, the grizzle, and the rough stock were mostly in demand, but which are now happily supplanted by bricks of a better class and quality, except in the erection of suburban villas and other jerry-built structures. One of the recommending advantages of the use of bricks over stone is the thorough and perfect bonding which may be obtained throughout the mass of the work; the ease and certainty of obtaining solid and homogeneous bedding of the bricks when laid by skilled bricklayers working under the recognised conditions essential to the production of good work. Also the imperishable nature of the material as compared with most of the building stones in use—even the granites. The ease with which they lend themselves to the construction and production of complex forms and outlines under a skilled treatment as compared with the vastly greater expenditure of labour and material required to bring about similar results in stone. Of the importance and necessity of solidly bedding the bricks and effectually flushing up the interior joints (known as cross-joints and wall-joints, no one is so fully alive as the civil or municipal engineer long experienced in the construction or personal superintendence of sewers, waterworks, and hydraulic works generally. The sewers recently built in a western suburb afford a good instance—a case in which the brickwork is so badly executed that to connect the house-drains to the sewers "would be," said the reporting engineers, "nothing less than converting the whole of the inhabited area into a hot-bed of typhoid fever." The question of flushing-up, as applied to a building, differs in degree of importance as applied to a sewer or similar work. Apart from flushing-up the brickwork, as a means of obtaining the maximum amount of tensile strength, in addition to that obtained by good transverse and longitudinal bonding, to carry the loads to which most walls are subjected, and to provide against the possible lateral movement of any of the constituent parts when the whole is under strain, the question has its sanitary aspect also; and by reference to most of the published engineers' pocket-books will be found formulae to find the amount of air in cubic feet which will, in a given time, under certain conditions stated, pass through walls of varied thickness built of different kinds of material. The walls of dwelling-houses, defectively flushed up, are therefore, admittedly, air-filters on a very large scale. They are also liable to be receptacles of damp driven in by storms, and induced by the hollow, or partially-hollow, state of the brickwork, leading up to disease, and in some cases, probably to fatal consequences. The seemingly paradoxical aphorism that "a wet building makes a dry house," is worthy of all acceptance. Walls built wholly of dry or insufficiently-wetted bricks will be found wanting in the two chief characteristics of

good work—viz., solidity, and a firm and binding adhesion of the bricks and mortar. This is nowhere better exemplified, on the one hand, than in old brick footings and walls in situations subjected to the continuous presence of adjacent moisture—many retaining walls, for instance, supporting an undrained or badly-drained bank of non-porous earth—in which case the chemical action set up between the sand-grains and the lime has gone on so uninterruptedly that the mortar has crystallised and attained that condition known to practical men as *water-bound* brickwork. In this condition the mortar, though set, is not hard, and could easily be reduced to a plastic pulp by heating, yet the adhesion between the bricks and mortar is so firm that to separate them is no easy task, the mortar very frequently tearing away with it portions of the bricks at the line of separation, the separation being generally effected by steel-pointed wedges driven by sledge-hammers. The extreme opposite case is that of building walls with dry bricks in the height of summer. The dust coating the bricks is unremoved, forming a separating medium or layer between the bricks and the mortar, and so preventing adhesion. And where dust is not present the moisture of the mortar is taken up with such avidity by the dry bricks that very little or no adhesion is the result, and the mortar, by examination when dry, is found to be little better than a cake of slightly moistened compressed dust. On the other hand, the bricks should not be wetted to the degree of saturation, or they will be incapable of absorbing the finer particles of the mortar into their body, which they should do, forming so many threads binding the bricks and the mortar together. Unless the bricks be well wetted to induce the mortar into the cross-joints and wall-joints during the *modus operandi* of flushing up every course, the work should be grouted. But under any conditions or circumstances the bricks should be wetted before use, except in winter or frosty weather, when the air is generally so humid as to reduce the absorbent power of the bricks. It is, then, advisable to forego the risk of wetting the bricks, especially if the work is in exposed situations.

RAILWAY CHARGES AND EXPENSES.

MR. M. R. JEFFERDS, of 18, Bishopsgate-street Within, has just published a graphic chart, giving the names of each State of the United States of America, and the names of the principal countries of the world; the area of territory, density of population, miles of railway in 1891, square miles of area to each mile of railway; percentage of railways to area, as compared with Belgium, which has one mile of railway to each four square miles of area, as shown by the graduated lines (one mile of railway to four square miles of area equals 100), the heavy lines showing the miles of railway in operation January 1st, 1881, and the open lines the miles that have been built since that date. The blank space between the ends of each line to a point equalling 100 shows the miles of railway that will be required to come up to the present Belgian standard.

The large diagram in its lower right-hand corner shows the average train loads in tons on eight American and two English lines of railway, the general expenses, maintenance of rolling stock, maintenance of way, transportation expenses, and the number of miles of railway operated by each company, from which it will be seen that heavy train loads are much cheaper to move per ton per mile than light ones. Upon the right of this diagram is a scale showing the track or sidings required to handle freight traffic under the practice of the Norfolk and Western as compared with the Midland Railway practice, from which it will be seen that if the Midland Railway Company use the same type of rolling stock that is used by the Norfolk and Western Railroad Company, they would not require over one-half the sidings they now use, or that with their present facilities they can handle more than double the traffic they are now handling. The centre diagram shows the charge per ton per mile, the working expenses per ton per mile, the increase of traffic, and the average train loads upon the New York Central Railroad for each year from 1870 to 1890 inclusive. From this it will be seen that by increasing their train loads from 103 tons in 1870 to 248 tons in 1890, they have been enabled to reduce their working

expenses 52.64 per cent., their charges 59.58 per cent., increase their traffic 393.21 per cent., and pay average annual dividends of 6½ per cent. Upon the left of this diagram will be found a table, giving the average annual wages paid upon the New York Central and London and North-Western Railways, showing that, although the working expenses of the New York Central Railroad are less than one half of those of the London and North-Western Railway, the New York Central pay their employes more than double the wages that are paid by the London and North-Western Company.

The next diagram above that of the New York Central shows the charge per ton per mile; the working expenses per ton per mile; the increase of traffic and the average wagon loads upon the Norfolk and Western Railway in America for each year from 1883 to 1891 inclusive, from which it will be seen that by increasing their wagon loads from 9½ tons in 1883 to 18.11 tons in 1891, they have been enabled to reduce their working expenses 52.63 per cent., their charges 61.43 per cent., and increase their traffic 727 per cent. Now, the question is very pertinently asked by Mr. M. R. Jeffers, How much have the English railways reduced their charges and working expenses during the past twenty years?

CHIPS.

The new tramp wards at Coventry are complete. The new building occupies the site of the burial ground of the old Carmelite Monastery. The architects are Messrs. G. and I. Steane, the builder Mr. J. Worwood, and the clerk of the works Mr. A. Davies.

The directors of the Grafton Galleries propose to inaugurate these galleries by an exhibition of modern pictures, both English and foreign. The buildings, which are between Grafton-street and Burton-street, are now on the high road to completion, and the first exhibition will take place at the end of November or early in December. The collection will not be a loan collection, but will be one of works contributed by living artists. It is also said that the New Gallery is to be occupied during October and November by a picture exhibition instead of the not very successful "Arts and Crafts" Exhibitions.

Memorial stones of new Primitive Methodist Sunday Schools, in course of erection at Wellgate Mount, Rotherham, have been laid. The premises, which include an assembly hall capable of seating 400 people, are expected to cost about £5,000, of which £1,000 has been raised.

The Duchess of Teck opened on Thursday week the Seamen's Institute and Rest, which has recently been completed, in West Ferry-road, Millwall. The building, which has been erected at a cost of about £2,150, including the site, from the designs of Messrs. J. T. Newman and Jacques, comprises two receiving-rooms and a meeting-room on the ground floor, with bedrooms above.

St. Nicholas Cole-Abbey Church is closed for some weeks, in order to carry out the repairs ordered by the surveyor on behalf of the Charity Commissioners. These include the rearrangement of the pews, so as to secure accommodation for about 75 additional seats; the thorough restoration of the spire, and various other internal and external reparation of a less conspicuous kind. The windows are also to be taken out and replaced after some readjustment. This last work will be carried out by the makers of the windows, Messrs. Campbell, Smith, and Co.; the structural repairs by Messrs. Dove Brothers, the whole being under the direction of Mr. George H. Birch, F.S.A., who decorated the church in 1884, and who was recently requested by the rector and churchwardens to supervise the present works.

The Trustees of the National Portrait Gallery have issued their thirty-fifth annual report, in which they acknowledge the presentation of ten portraits and busts, and mention the purchase of fifteen portraits and a portfolio containing twenty-one drawings by Sir G. Hayer.

On the 14th inst. Mr. Rienzi Walton, M.I.C.E., an inspector under the Local Government Board, held an inquiry at Burslem as to the corporation borrowing £9,000 for public baths, £5,000 for the purchase of about 22 acres of land to be laid out as a park and recreation ground, £3,750 for public improvements, and £1,600 for sewage purposes. The borough surveyor, Mr. F. Bettany, described the various works. There was no opposition, and the inquiry closed with a vote of thanks to the inspector.

A new Wesleyan chapel was opened at Brymbo last week. Mr. W. Lloyd Jones, of Bangor, is the architect; and Mr. Charles Burt, of Liverpool, the contractor. The building seats 600 persons.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 382, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

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One Pound per annum (post free) for any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 90c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 80c.). To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and SIXPENCE for every eight words after. All Situation Advertisements must be prepaid.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL., XLII., XLVI., XLIX., LI., LII., LIV., LVIII., LIX., and LX. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—J. F. M.—G. and T. R. Co.—Mid-Sussex.—F. B. Maitland.—P. R. F. Co.—F. W. (Kingston).

Correspondence.

HEALTH EXHIBITION IN NOTTINGHAM.

To the Editor of the BUILDING NEWS.

SIR,—Our scheme for holding an exhibition of sanitary appliances in connection with the annual meeting of the British Medical Association in Nottingham, and under the joint patronage of the Association and the Nottingham corporation, seems likely to prove a success. Thirty-six important firms, including Messrs. Allen, Anidjah, Billington, Foster and Cooper, F. Henry Carter, Calvert and Co., Hughes and Lancaster, Jennings, Longford (Bedding) Co., Merryweather, Parkes and Hassall, Stone and Co., Sanitas Co., Tollory and Son, Tylor and Sons, Watts and Whitfield, have engaged spaces and paid their deposits. The stalls are 420ft. in length, and have a uniform width of 8ft. As already announced, the Nottingham corporation have lent the covered and wood-paved yards (measuring 100sq. ft.) at the rear of the Guildhall, and are laying the necessary water mains. The patent jointed drain-pipes of Messrs. Parker and Hassall will be laid under the stalls, and connected with the nearest street sewer. This complete system of water supply and drainage will enable all working hydraulic apparatus to be shown in operation. The President of the British Medical Association, with the Mayor of Nottingham and Sir Walter Foster, will perform the opening ceremony at 11 a.m. on July 26. Certificates of merit in three classes will be awarded to deserving manufacturers or inventors. Twelve representative gentlemen from London and the provinces have consented to act as judges of exhibits.—I am, &c.,

PHILLIP BOOBYER, Hon. Sec.
Guildhall, Nottingham, July 18.

A HINT TO ADVERTISERS.

SIR,—I should be glad if you would inform the tradesmen advertising in your journal that we should be very glad to receive illustrated catalogues of goods suitable for houses, shops, churches, and so forth, with particulars as to prices. At present we have to use fittings, &c., imported by the wholesale houses, which are inferior and not up to date. I may mention revolving shutters, window and casement fittings, decorations, and wall-papers.

Thanking you in advance for what will be a service to the profession here,—I am, &c.,

GEO. A. H. DICKSON, A.R.I.B.A.,
Pretoria Diocesan Surveyor.

Box 1006, P.O., Johannesburg.

Intercommunication.

QUESTIONS.

[10817].—**Showing White Lines.**—A junior draughtsman would like to know the neatest method of expeditiously showing white lines of sash-bars and leads in leaded lights, where glass is shown black, as in the drawings of Mr. Runtz for Oxford municipal buildings in last issue.—A. J. D.

[10818].—**Iron Drains, &c.**—I am architect for some building works in a neighbourhood where I understand that an architect before me has been prohibited by the vestry from using iron drains properly coated inside and out, and now I also am forbidden to use them. Can any of your readers show the justice of by-laws of vestries boycotting properly coated iron drains? Surely there is a sufficiency of opinion in favour of them to justify their use? May I suggest that it is a hardship on the public, and a pity in these go-ahead days (1) that building and sanitary laws and regulations are so inelastic and full of petty details, that they cannot deal reasonably with variations from ordinary cases; (2) that so little is left to the discretion of authorities (with power of appeal in disputed cases), and (3) that said laws and regulations are wanting in loopholes to admit of progress and improvement in existing methods?—A. HENRY FRANK, Gray's Inn.

REPLIES.

[10810].—**Drainage.**—When "Architect" wants information to enable him to win a recently-advertised competition for an Infectious Diseases Hospital, he should consult the various works dealing with such matters, as "Baldwin-Latham," "Humber," and the like, and not attempt to get information cheap, or without taking the trouble to inquire for himself. Is "Architect" one of the competitors at Keighley?—DRAIN PIPE.

[10811].—**Paris.**—The principal architectural papers published in Paris are: "La Revue Générale de l'Architecture et des Travaux Publics" (monthly), "Croquis d'Architecture" (monthly), "La Semaine des Constructeurs" (weekly), "La Gazette des Architectes et du Batiment" (weekly), "Le Recueil d'Architecture" (monthly).—F. E. GAY, Bath.

[10815].—**Building Estate.**—In reply to "N." in your issue of the 15th, some surveyors (1) would do the work for 3s. or 4s. an acre, others would charge as many guineas and be cheaper in the end. You should calculate how long the work will take you, and consider the difficulties on surface. Then fix a price, allowing for assistant or chainman, expenses and materials. In my opinion, a surveyor who understands his business would consider two guineas a day a minimum charge.—U.

[10816].—**Saloon Floor.**—We should recommend McKenzie's patent removable parquet, which is very extensively used, and can be obtained of any first-class decorator or upholsterer.—J. L. AND L.

CHIPS.

A permanent memorial of the late Lord Lytton in the form of a medallion is to be placed in the crypt of St. Paul's Cathedral, and the commission has been given to Mr. Alfred Gilbert, A.R.A.

A large part of the massive wall of the tower of the parish church, Great Chishall, Essex, fell in with a loud crash at an early hour on Tuesday morning. Signs of lateral expansion of the tower had been noticed of late, and on the previous day a survey had been made with a view to removing the peal of bells, which are now left hanging in a dangerous position.

Mr. Henry Stevens, a well-known Eastbourne builder, has just died at Hailsham, after a few weeks' illness. The deceased was 63 years of age.

On Monday Major-General Phipps Carey, R.E., an inspector of the Local Government Board, attended at the Blackpool Town Hall to hear an application for sanction to borrow £11,650 for the purchase of a site for new municipal buildings, and land for street improvements. Mr. Loftos (town clerk) stated that three members of the council had purchased land and buildings adjoining the present town hall for £6,585, and land in Topping-street, for the purposes of widening that thoroughfare, for £5,065. Dr. Jasper Anderson, medical officer of health, testified to the insanitary condition of the offices, and attributed a serious illness from which one of the clerks had suffered to his working in a vitiated atmosphere.

Legal.

CONTRACTORS' RISKS.

THE contracts signed by builders and contractors are a frequent source of surprise to lawyers and others who are not used to the way in which risks are run in the building trades. But the case of "Botters v. Mayor and Corporation of York" (*Times*, July 18, 1892), just decided by the Court of Appeal, brings out so plainly and pointedly the dangers of entering into contract without due inquiry, that it is likely for some time to be a leading authority as well as a standing warning. It appeared that the corporation desired to build sewers along by the banks of the river Ouse, and they obtained tenders for the works, according to plans and specifications and prices, in the usual way. The plaintiff tendered at £55,000, and although he was warned by the corporation that his price was much below all the others, he stuck to it, was accepted, and signed a contract containing all the most stringent possible clauses. The engineer's decision was to be final, and his arbitration conclusive; while the engineer could give verbal orders which the contractor must obey, but for which, although they compelled him to do extra work, he could not obtain payment because they were not in writing.

It very soon appeared that, from the nature of the subsoil, the works could not possibly be constructed by the contractor at anything under three times the price he had accepted. In fact it was almost impossible to build anything in such a mass of mud, and much of the work he did do had to be done all over again. At length the contractor, seeing that he must be ruined if he went on, threw up the contract. The corporation, under their powers, took possession of the works so far as they were executed, and of all the contractor's plant, &c. In the action Mr. Justice Mathews, though he said it was a very hard case, felt reluctantly obliged to find in favour of the corporation on the broad ground that the contractor was breaking his contract, notwithstanding he had made such a foolish bargain. The Court of Appeal in the same way were obliged to confirm this ruling. There was the contract, and it could not be thrown up because to go on with it would have ruined the contractor. The engineer had given orders to do works over again that were rendered necessary by the nature of the soil, and which orders he had a right to give, nor could the contractor legally demand that they should be in writing, so that he could claim payment as for extras. There was thus no legal ground for the contractor's refusal to go on under the contract he had signed, and so he lost his action. It was not proved in any way that the corporation knew how bad the subsoil was, though they seem to have known more than their unlucky contractor, who appears to have made no inquiries into this matter, and who gave himself over bound hand and foot to the engineer.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

CONTRACTOR.—CLERK OF WORKS.—Although there is no special clause in the contract as to appointing clerk of the works, it appears that one has been chosen by the building owner and his architect, and that you have for some time worked under him. There is no way by which you can now refuse to have him upon the works, because you have fallen out with him over some details. But you can appeal to the architect, whose agent he really is, against his directions.

LEGAL INTELLIGENCE.

EMPLOYERS' LIABILITY ACT.—CONTRACTOR AND SUB-CONTRACTOR.—(Brompton County Court, before his Honour Judge Stonor and a Jury.—Springett v. Allen.)—This was an action brought under the Employers' Liability Act for compensation on account of injuries received by the plaintiff owing (1) to a defect in the rope attached to a snatch-block used for raising stones and (or) (2) to the scaffolding being too short, so that the rope was unable to bear the strain of raising stones so that it broke, causing injury, &c. Mr. Le Breton, instructed by Mr. Edmund Pooley, of Sloane-street, appeared for the plaintiff, and Mr. Foulkes Griffiths, instructed by Mr. Llywelyn Griffiths, of Harrow, appeared for Messrs. Allen and Son. The case had been heard on April 26, when a verdict

was given for the plaintiff; but a new trial had been ordered. Mr. Le Breton said he would go on the Common Law claim, but would not abandon the alternate Employers' Liability claim. Plaintiff stated that on Nov. 20 he was at work on a scaffold pertaining to the new Walham-green Wesleyan Chapel. While he was pushing the stone, which hung on a chain, in order to get it into position, the snatch-block at the bottom of the scaffolding broke loose. This was owing to there being no sufficient headway for the stone to swing easily. The longer the swing of chain from the pulley, the easier to move for setting. He had asked the chief contractor's foreman to erect a higher scaffold, but he said he was just then too busy. The rope fixing the snatch-block to the pole was quite strong enough, except for this extra strain of pushing. He was bruised when the stone fell, and taken to St. George's Hospital. Cross-examined by Mr. Foulkes Griffiths: He was in the employ of Mosslin Bros., stonemasons; they paid him his wages, and were sub-contractors for the stonework only. The tackle, including the jib fastened to the scaffolding, belonged to the sub-contractors, and was set up by the two labourers working under him. He considered himself under the orders of the chief contractor's foreman. He had left the stone on the pulley all night. He was sure it was not on the strain of the chain, but rested on the scaffold. Edwin John Thomas, the plaintiff's attendant labourer, said that the tackle had been put up by him. He had found the rope on the job; it belonged to Allen and Son. It was about 18ft. long, and was coiled round the pole several times to fix the snatch-block. Cross-examined: He had not asked anyone for the rope. All the rest of the tackle was chain, and belonged to Mosslin. He had brought nothing to fasten the snatch-block, so went in search of a rope. Chains were sometimes used; not mostly. Rope would be liable to influence from rain and frost. The rope was fairly good. He produced part—that part showed a little rottenness; but any rope would get rotten. He had not sworn on the previous hearing that the rope was rotten, and was found on a heap of lime. Allen's man erected the scaffolding for the masons, not for the bricklayers. The front of the chapel was brick with stone facings. This stone weighed about 90wt. The scaffolding was a necessity. The rope would not have snapped if there had been more length of chain at the top to swing the stone. Mr. Mosslin said he was manager of office work for his father. Allen and Sons would, under the contract, be required to provide all scaffolding for the sub-contractor (Mr. Griffiths called for the contract, which was a short memo. signed by Mosslin Bros. without reference to scaffolding). The memo. was only part of the contract; there would be a printed paper, which was invariably sent with their estimates, and this contained stipulations as to the scaffolding. Springett was under the orders of the foreman of the job, Otterwell. This foreman, Otterwell, was Mr. Allen's head man on the job, and Springett would be dismissed by Mosslin if he declined to do the work as Otterwell directed.—His Honour: That only shows that for this purpose Otterwell, who is Mr. Allen's foreman, was also the agent of Mosslin to give orders. As such, Mosslin is responsible for him, not Allen and Sons, for Mosslin chose to put their man under him. The act of Mosslin does not make Allen the employers.—Cross-examined: A claim was made against us by Springett. We referred it to our Insurance Society, and they advised us not to pay. If we had paid they would have recouped the money to us. Springett was foreman, with two labourers under him. All the tackle was theirs except the borrowed rope. The "jib" was a pole from the job like the scaffold poles. Two more scaffold poles would have been sufficient to raise the jib, but his men had nothing to do with that. It would be their business to put up the jib and tackle, and no more.—Re-examined: The erection of the scaffold by defendants would be considered in the estimated price. The other labourer corroborated Thomas, and the "setter" who went on the job after the accident, said that before he worked, the rope was replaced by a chain, and the jib was raised.—Cross-examined: These changes were effected by Mosslin's men in charge of the tackle. He did not know if Springett could have demanded this. Rope was very frequently used to fasten the snatch-block in such cases. For the defence, Mr. Charles James Allen, one of the partners, stated that no printed paper was associated with the contract; but the firm would naturally permit Mosslin Bros. to use their scaffolding apart from any contract. He remembered the night before the accident noticing the stone was left on the chain, and he drew Springett's attention to it. Springett replied: "It is not on the scaffold—it is resting on the chain." This implied that, as it would not injure their scaffold, he need not trouble. A snatch-block ought to be fastened by a chain if the rest was chain-tackle. Cross-examined: The scaffold would doubtless be expected by Mosslin when he sent in the estimate. Mosslin did not mention it specially. They did not usually subtlet their stonework; but in

this case, Mosslin being in the locality, and recommended by the chapel trustees, they did so. Walter Otterwell, foreman of the job, said that Springett never did ask him to alter the scaffold. Springett had two labourers, and they could easily have hitched on two poles and raised the jib. The rope at the bottom was several times complained of, as it ought to be a chain. If it broke, it would endanger the lives of all of them, quite as much as the mason. Cross-examined: He would not object to Springett's labourers altering his scaffold. He would not have deemed it intermeddling. He was sure Springett had not complained to him. Ropes are not often used to fasten snatch-blocks, as the rain swells them. There were two unused small chains all the while in the store-room. Davis, the scaffold foreman, also said he had received no complaints. He did not expect any, as the masons had no right to interfere with the scaffold. They took it as they found it. Defendant's counsel argued that the particulars of claim mentioned a defect in the rope. The rope was clearly supplied by Mosslin's men (of whom Springett was foreman), who elected to use it instead of a proper chain, and the defective rope would imply contributory negligence, even if defendant was liable for the scaffold, "in pari delicto potior est conditio defendentis." This claim was not admissible under the Employers' Liability Act, as "Johnson v. Lindsay" (decided last autumn in the House of Lords) showed that a chief contractor was no employer of sub-contractor's men. There was no contract to supply scaffolding, but only license to use scaffolding erected for the bricklayers and other general purposes. The defendants, as inviters to use the scaffold, were only responsible for the condition of its essential parts—not for the putting of a "jib" too low when a crane might be used, or two more poles put up, by those who put up the tackle. This was a common-law liability. If plaintiff asked for the poles to be raised, he knew of the danger. He also left the stone on the pulley all night, so that until that stone was removed by himself it was impossible to move the jib higher. If the jury thought the rope and the scaffold were both to be condemned then they would clearly say so. Mr. Le Breton made a forcible appeal to the jury. His Honour put the following questions to the jury:—1. Did the accident occur through a defect in the rope? 2. Did the accident occur through the scaffolding being too low? 3. Did it happen through both these causes combined? 4. Did the defendant agree to provide scaffold for the stone masons either by implication or in writing? 5. Did the defendant merely provide scaffold for the bricklayers and all parties? 6. Did the plaintiff fully know the risk and accept the work? 7. Did the plaintiff apply to Otterwell to raise the scaffold, and was Otterwell foreman over him? Mr. Griffiths asked that a question as to the personal knowledge of Mr. Allen might be put as under the common law; knowledge of the foreman was not enough. The judge thought this not needful. The jury after some deliberation returned to court with affirmative answers to all the questions except the fifth. Verdict was claimed for the defendant, and at once so ordered. Mr. Foulkes-Griffiths said they would not press for costs beyond the return of what was paid into court for the new trial.

CLAIM BY A PLYMOUTH BUILDER.—Before Judge Edge and a jury at the Stonehouse County Court last week, James Prout, carrying on business as a builder at Cecil-street, Plymouth, sued his mother-in-law, Margaret Toblicock, of Grosvenor-street, Plymouth, for £6 8s. 10d., balance of work done and goods supplied. In 1885 the defendant instructed plaintiff to knock off the old plastering of the house in which she lived, and to plaster it with Portland cement. This was done, and a charge of £16 14s. 6d. made. Defendant expressed her satisfaction with the work when completed, and it was only twelve months ago the defendant complained that the work had not been properly carried out. There was a counter-claim for £8 7s. 3d., which defendant alleged was due to her as damages for negligence in the work done by the plaintiff. Plaintiff stated that he did the work according to the agreement. The work was properly carried out, and the charges were fair. Mr. J. L. Hodge, surveyor of the Stonehouse Local Board, and Mr. A. R. Lethbridge, builder, Plymouth, stated that they had examined the plastering, and were of opinion that it was good. The charges were fair. The defendant stated that the plaintiff told her the work would remain good for twenty years, and had promised to complete it for £12. Messrs. S. Harvey and W. H. Taylor, builders, of Plymouth, were of opinion that the stucco was not good, and that the work had not been properly carried out. The jury found for the plaintiff on the full amount claimed.

CHURCHWARDEN'S RESPONSIBILITY FOR REPAIRS.—**BUTLER V. PEMBER.**—This was a motion for a new trial before Lord Justice Lindley, Lord Justice Lopes, and Lord Justice A. L. Smith. The plaintiff was a builder, and the defendant, who was a house and estate agent, acted as a churchwarden at a proprietary chapel known as Christ's Church,

Carlton-hill, St. John's Wood. The plaintiff sued for a sum of £164, the cost of repairs and alterations to the church, which, he said, had been ordered by the defendant. It was agreed at the trial that only the question of liability should be then tried, and that, if necessary, the builder's account should be referred. The defence set up was that the orders were given by the defendant as agent for the incumbent, and that therefore the defendant was not liable. When the repairs were started the incumbent was Bishop Richardson (a Bishop of the Protestant Episcopal Church in America). He, through the defendant, subsequently sold the chapel to a Mr. Tully, a clergyman of the Reformed Episcopal Church in America, and, partly owing to the purchase-money not having been paid, the Bishop had had to file his petition in bankruptcy. The contract of purchase provided that the new incumbent should take over the liabilities of the church improvements, and the defendant said that the orders he gave subsequent to the sale were given on behalf of Mr. Tully. The plaintiff produced his books showing that he had a private account with the defendant, and that the church account had been opened in the name of "Pember, Esq." There was considerable conflict of testimony as to who had given what orders and as to the precise language used. The action was tried on June 23 and 24, before Baron Pollock and a special jury. The jury found for the plaintiff. On June 27 Baron Pollock entered judgment for the plaintiff in accordance with the verdict, and referred the amount to an official referee, and he refused to grant a stay of execution. The defendant now moved for a new trial, on the ground that the verdict was against the weight of evidence. The Court dismissed the application. Lord Justice Lindley said that this was eminently a case for the jury. The action was for labour done upon a church which, when the work was commenced, belonged to Bishop Richardson. He sold it during the progress of the repairs to one Tully. The evidence was unquestionably conflicting, but it was clear that the plaintiff did the work at the request of somebody. The plaintiff swore that the only person from whom he received orders was Pember, and the jury believed him. Pember acted as churchwarden, and it was obvious that he took a great deal of interest in the matter. This case was not even near the line. There was ample evidence to justify the jury in finding that the only person to whom the plaintiff looked for payment was Pember. His Lordship was inclined to think that the verdict was right. The application failed. Lords Justices Lopes and A. L. Smith concurred.

A BRIDGE BUILDING CASE.—**SMITHSON V. THE WIGTON HIGHWAY BOARD.**—Plaintiff in this case was Richard Smithson, builder, of Workington, but late of Ireby, and defendants were the Wighton Highway Board. The plaintiff claimed £13 balance of the agreed price of building a bridge at or near Snow Hill, Caldbeck, over the Ellerbeck, on or about the month of August, 1890. In the alternative plaintiff claimed the like amount *quantum meruit*. Mr. T. Hodgson appeared for plaintiff, and Mr. Gibson for the defendants. A counter-claim of £50 was filed by defendants for improper construction. The Judge of the Wighton County Court gave judgment for plaintiff for the full amount claimed, with costs.

ALLEGED ADVERTISEMENT FRAUDS.—A tall Yorkshireman, described as a builder and engineer, was charged at Westminster Police-court last week with obtaining money by false pretences by way of advertisements in London and provincial newspapers. In the charge-sheet prisoner's name stood as John West. He is said to have adopted aliases of "Wilson" and "Vernon." Prosecuting for the Treasury, Mr. Sims said the prisoner was charged with conspiracy with a man named Humphreys to defraud a number of persons by pretending to engage them as timekeepers and clerks on building estates, which he alleged he possessed at Surbiton, Putney, and elsewhere. Six cases would be gone into, in which the prisoner obtained nearly £700 from poor fellows who were led to intrust him with money through his specious advertisements. Some of the victims had parted with the whole of their savings, and had been left penniless. The man Humphreys, his brother-in-law, was convicted at the last Old Bailey Sessions for complicity in the frauds, and was sentenced to twelve months' hard labour.—Martin Sherman Kerry said in November, 1891, he was living at Eye, Suffolk. He had a sum of £300 left him by his mother. In response to an advertisement for a timekeeper he got into communication with the prisoner, who represented that he was building extensively at Surbiton and other places. Prisoner also represented that the situation vacant was one of trust, and in the end witness parted with £250 as "security." After giving his money he went, at the prisoner's suggestions, to his City offices in Featherstone-buildings, High Holborn. The name on the door was "The Lost and Found Key Society." Witness's chief occupation was answering letters and applicants in response to periodical advertisements which were inserted for people wanting situations. A cash security was re-

quired, and the prisoner told him to engage anybody who could deposit £75. Witness only knew of one *bona fide* business transaction at the offices—the purchase of a large load of bricks. Some of the advertisements offered large interest to people who would invest their money—15 per cent. monthly. There was some excavation commenced at Surbiton, but it was stopped almost immediately. There was nothing there but a few pails and a wooden hut. Prisoner cross-examined witness with a view of showing that he (prisoner) was carrying on a genuine business, and that it was owing to circumstances over which he had no control that he was unable to fulfil his engagements. The hearing of the case was not concluded; but witnesses already examined were bound over to appear at the Old Bailey.

A LEEDS ARCHITECT INSOLVENT.—A meeting of the creditors of Samuel Smith, architect, surveyor, and valuer, Leeds, was held at the office of the Official Receiver, Park-row, Leeds, last week. The debtor's liabilities amount to £95 5s. 3d., and there are no assets. None of the creditors were present, and no resolutions were passed.

RIGHT OF ACCESS.—**RAMUZ V. SOUTHEAST LOCAL BOARD.**—The plaintiff is the owner of land at Southend conveyed to his predecessors in title in 1866 by Mr. William Wagstaffe, the deed of conveyance describing the land as being bounded on the south by the public Promenade-road bounding the shore of the river Thames. He further contended that the effect of this conveyance was to vest the property in the soil of the public Promenade-road—now known as the Esplanade—in his predecessors in title, that such property was now vested in him, that any title of the local board to the Esplanade existed under conveyance from persons claiming under Mr. Wagstaffe, and that the board were therefore estopped from saying anything except that the soil of the Esplanade was vested in the plaintiff, subject only to the rights of access of the general public to such Esplanade as a public highway, which, he alleged, existed as such from prior to the year 1866. Under these alleged circumstances the plaintiff alleged that in December, 1890, a fence was erected by the board, partly on the plaintiff's land, and partly between such land and the Esplanade, whereby he was deprived of direct access to the Esplanade. To prevent the continuance of such fence he claimed an injunction, he also claimed damages. The local board said that the Esplanade was not a public highway, but a pleasure ground vested in them for the purpose of being so used under their control for the benefit of the inhabitants of Southend; that the fence was erected wholly on their land for the preservation of the pleasure ground, and that the plaintiff had no right of direct access from his land to the Esplanade, his only right of access being that which he possessed in common with the other inhabitants of Southend. Mr. Justice Romer delivered judgment last week as follows:—The plaintiff is entitled to succeed in this action. It is clear that his land comes down to the very edge of the public promenade. If the fence erected by the defendants is not on the public promenade it is on the plaintiff's land, and the defendants were wrong in placing it there. On the other hand, if the fence is on the public promenade, then also the defendants were wrong, for that promenade is a public highway for foot-passengers, and it is settled law that a man owning land which runs right up to a highway is entitled to access by that highway from his land. I need not refer to authorities for this proposition of law, nor, indeed, was the general proposition actually challenged by the defendants' counsel, but reference was made to the case of "Lyons v. Fishmongers' Company" (L.R., 1 App. Cas., 662), and it was suggested that this case threw some doubt on the proposition where the owner of the land was not also presumptively owner of the highway immediately adjoining. But "Lyons v. Fishmongers' Company" threw no such doubt. On the contrary, if the judgment of Lord Justice Mellish is carefully looked at, it will be seen that he fully recognised the law to be settled as I have stated. All that was decided in that case was this:—The access of the plaintiff in that case to the river highway had been stopped by statutory authority which took away the public rights without compensation, and only provided for compensation being paid where private rights were interfered with. The Court of Appeal held that the plaintiffs in that case had no private rights interfered with, but this was overruled by the House of Lords. But, though admitting the general proposition of law, and that the public promenade had been dedicated to the public and was a highway, the defendants' counsel contended that the dedication was limited in such a way as to justify the defendants' action in putting up the fence. But I can find no evidence of any limitation. The promenade has been for years and is used over every part of it by the public as of right without regard to their object in using it. It has been for years and is always open for foot passengers at both ends, night and day, and constantly used not only for strolling up and down, but for going

from Southend to Leigh, and from Leigh to Southend, and even if it had only been used as a promenade, yet, as the public right would extend all over it, I cannot see how the defendants could now take away a strip of it by putting a fence on it, or why it was not still a highway to which the plaintiff had right of access from his land. Some suggestion was made at the end of the argument of the defendants' counsel that there might be some part of the promenade at the side not used by the public, and the fence may have been placed by the defendants on this part. But I can find on the evidence no ground whatever for this contention. The promenade is used by the public over every part of it without limitation, and, as I before remarked, if this fence be not on the public promenade, then it is clearly on the plaintiff's land. This renders it unnecessary for me to decide whether the plaintiff is not also entitled to succeed on the ground that the promenade is admittedly erected on the foreshore, and that under the conveyance to him of his land he is entitled to access to the sea over the promenade. It follows that the plaintiff is entitled to a mandatory injunction to compel the defendants to remove the fence, and, as he has suffered special damage by the defendants' acts, he is also entitled to an inquiry as to the amount of that damage. Costs to the hearing. Subsequent costs will be reserved, and there will be liberty to apply as to payment of damages and subsequent costs, and generally.

ERECTING WOODEN STRUCTURES WITHOUT LICENSES.—The proprietor of Parke's drug store, Rye-lane, Peckham, was summoned, at the instance of the London County Council, on Tuesday, for having erected a movable or temporary wooden structure without having obtained the license of the Council. Mr. Burton appeared for the Council, and Mr. C. F. Gill defended. Mr. Burton said the structure in question consisted of a wooden frame, with glass centre, and fixed upon the parapet of the shop, and supported by iron rods. Mr. Parcial, one of the surveyors under the County Council, produced a plan, showing the nature of the erection. In cross-examination, the witness said he could not say whether this was the first case of the kind brought before a court. No inhabitant had, so far as he knew, complained of the erection. He believed it was first mentioned by the district surveyor.—Mr. Gill said what was complained of was nothing more than an ordinary signboard, and contended that it did not come within the section of the Building Act under which these proceedings had been taken.—Mr. Burton, on the other hand, urged that it did. Mr. Hopkins said it appeared the complainants had found they could not get at the matter under the Signs Act and had fallen back upon the Building Act. He agreed with the view put forward by Mr. Gill, and, therefore, dismissed the summons. Mr. Burton asked the magistrate to grant a case.—Mr. Hopkins said he could not do that. Mr. Burton could apply for a mandamus.—Mr. Burton said he should decline to do that.

CONTRACTORS' REFUSE.—**ALLHUSEN V. VIGERS.**—The plaintiff, who had recently purchased a residence, known as Twyford Abbey, near Ealing, applied on Saturday in the Chancery Division for an interim injunction restraining the defendant, a dust contractor, from causing a nuisance by an accumulation of refuse in the vicinity of the plaintiff's residence. The defendant denied the nuisance, and it was suggested that it might be attributed to other smells existing in the neighbourhood, which was a convenient one for nuisances. His Lordship said that there was no such thing at law as a convenient place for nuisances. The plaintiff had a strong body of direct evidence to support his case, and had made out a case which entitled him to an interim injunction. The defendant, however, was merely carrying on his business, and it was not, therefore, right that the interim injunction should be made to operate at once. That being so, he granted an interim injunction restraining the defendant from causing the nuisance by smell, but the operation of the injunction would be suspended for three weeks. The action would be set down for trial as once on the issue of nuisance or no nuisance.

STYLES AND SONS V. CROFT.—The plaintiffs, a firm of builders, last Friday, in the Queen's Bench Division, before Mr. Justice Wright, sued the defendant, a wine merchant, carrying on business in Water-street, City, to recover £65 18s., balance of an account for work done at the Pelican Club, Gerard-street, Soho. The plaintiffs' case was that a contract was entered into by them with the defendant, as the proprietor of the club, to do certain repairs and make alterations at a cost of £263. They carried out the work, and there was an amount of something over £30 of extras. The contract was entered into through Mr. Waters, an auctioneer and surveyor, at the time in the employ of Messrs. Giddy and Giddy, house agents, and it set out that it was entered into with the defendant as the proprietor of the club. Mr. Waters, moreover, gave a certificate for £230, which had been paid in the name of Mr. Croft, and this was paid by

a firm of solicitors to whom it was said defendant referred the plaintiffs. The defendant's case, however, was that he was merely acting in the matter for his brother-in-law, Mr. H. E. Wells, who was said to be the real proprietor of the club. The defendant said he never had any interest whatever in the club, and was unaware of the fact that his name appeared in the contract or certificate. The solicitors who paid the amount specified in the first certificate were Mr. Wells's solicitors as well as his own. He denied that he had ever stated that the club belonged to him. The Judge said defendant did not allege that he gave Waters to understand that he was acting on behalf of Mr. Wells. Under these circumstances, although very likely Mr. Croft did not know his name was in the contract as a principal, he was liable, whether he was the real principal or not. Judgment would, therefore, be given for the plaintiff for the amount claimed, with costs.

BUILDINGS IN BACK GARDENS AND THE BUILDING ACT.—At Hampstead, on the 13th inst., Mr. John Bishop Hutchins, a builder, of Wanstead, Essex, was summoned by Mr. William Smallpiece, the London County Council's district surveyor for East Hampstead, for having erected a greenhouse at 12, Downshire-hill, Hampstead, without first giving notice to the district surveyor in accordance with the Metropolitan Building Act. There was also a summons against the defendant for contravening the Building Act by the manner in which the greenhouse was erected; but that was not proceeded with. Mr. Smallpiece, the district surveyor, said he "discovered" this building (the greenhouse) in the garden of 12, Downshire-hill, no notice having been given to him of its erection; but the defendant had since explained to him that he was not accustomed to building in London. The defendant said it was a portable greenhouse, 10ft. square. Replying to the Bench, Mr. Smallpiece said that no one really had a right to put up a wooden dog kennel, or a fowl-house, or a bicycle shed, without first giving notice to the district surveyor and obtaining his consent. Defendant said he was quite ignorant about having to give notice. The Bench inflicted a nominal penalty of 1s., with the cost of the Court, and 5s. costs for the district surveyor. Mr. Smallpiece withdrew the other summons against the defendant, as he had promised to amend the erection in accordance with the Building Act.

CONTRACTORS' RISKS.—**BOTTEMS V. MAYOR AND CORPORATION OF YORK.**—(Court of Appeal, before Lord Esher, Master of the Rolls, Lord Justice Bowen, and Lord Justice Kay.)—The hearing of this case was concluded last week by a judgment for the corporation. It was a case raising in substance the question whether the contractor or employer must bear the burden of an enormous increase of expense caused by the muddy and unstable nature of the soil, which neither party had tested or inquired into, and it will be seen that the Court determined in effect that the contractor took the risk of it. The plaintiff had entered into a contract with the Corporation of York to construct sewers along the banks of the Ouse according to certain specifications and plans, and at certain prices for the measured work, measured as completed. By the contract, as usual, the sewers were to be constructed to the satisfaction of the engineer, and the power was reserved to him to vary or extend the quantities of the work, to alter the line level or portion of any work, to increase or change the size, character, or kind of the work, and the contractor was not to have any claim upon the corporation for any such variation or extension, other than for the work actually done, according to the prices of the contract. And if the engineer used the power thus reserved to him, or ordered the contractor to execute the work by day work, an order in writing was to be given to the contractor to that effect, and any works executed under such order shall be paid for at the rates set forth, and orders given verbally are to be regarded as instructions for the execution of the works included in the contract, and no timber used and left in the work was to be paid for unless ordered to be left in by the engineer. And if the contractor did not execute the works in a sound and workmanlike manner, or neglected to amend inaccurate work to the satisfaction of the engineer, the corporation might give the contractor notice to proceed with the due and proper execution of the works, and if he failed to do so, then the corporation might terminate the contract and take possession of the plant of the contractor, who was to have no certificate for payment until he had finished work to the satisfaction of the engineer to the amount of £2,000, the total amount at the prices fixed being £55,000, and in case any dispute arose the engineer's decision was to be final. The contractor, on the contract being entered into in March, 1891, commenced the work, but it was found the soil was of so muddy a nature as to require a great deal of propping by timber to prevent it from falling, and so the work was executed under great difficulties and at a far greater expense than contemplated; indeed, the contractor stated (and, as the learned Judge said, correctly) it would cost

three times the amount of the estimated expense. Under these difficulties, however, in June he had completed 136ft. of the sewers, and, as was admitted, this part was well executed by him. But, as he alleged, the pressure of the muddy soil on each side altering the size of the sewer, the engineer, or one of the inspectors under him, again and again required the work to be cut out and done in another way, which was done, the contractor said, more than once without orders in writing. On June 9 the engineer again required him to cut out and reconstruct a part of the sewer completed, which he refused to do unless ordered in writing and paid for extras. This was not agreed to, and on that day he stopped the work and withdrew his men, on which the corporation, having given him notice under the contract, put an end to the contract and took possession of the contractor's plant. He then brought this action, which was tried before Mr. Justice Mathew without a jury, and he came to the conclusion, though very reluctantly, that the corporation were entitled to judgment. It was, he said, a hard case; the contractor had made a very foolish bargain, but he was bound by it. According to the law lately laid down in the case of "De Morgan, Snell, and Co. v. Rio de Janeiro Flour Company" (8 the *Times* Law Reports, 292), the engineer in such cases was the arbitrator, and his decision was final. It was quite clear the effect of the contract was to deprive the contractor of any right to claim in respect of extra work upon the footing that the work had been varied unless he had the written order of the engineer, and it was entirely in the discretion of the engineer whether he would or would not give written orders. The learned Judge, therefore, gave judgment for the corporation, and the plaintiff, the contractor, appealed. The Attorney-General (with Mr. Raikes) appeared on his behalf, and argued in support of his appeal. He was heard at some length on Friday, and on Saturday continued his argument. Mr. Lockwood, Q.C., who appeared for the corporation, was not called upon. Their Lordships, without hearing him, came to the conclusion that judgment must stand for the corporation. Lord Esher in giving judgment said, however they might regret it, they were bound to give judgment against the contractor. He had entered into a contract which he found he could not carry out—that is, without being ruined—and he threw it up without being entitled to throw it up. The real reason why he had come to grief was that he had not ascertained the nature of the soil before he entered into the contract. In consequence of the nature of the soil the engineer gave orders which he was entitled to do, without any extra payment to the contractor. The contractor demanded written orders on which he would be entitled to be paid. That was refused, and then he threw up the contract. He was not entitled to do so, as he was not entitled to demand written orders. He had failed to show any legal ground for throwing up the contract, and he threw it up wrongfully, on which the corporation exercised their right to put an end to it and to take the contractor's plant. The contractor must take the consequences of the imprudent contract he had entered into. The judgment of the learned Judge, therefore, in favour of the corporation was right and must be upheld. Lord Justice Bowen concurred. The real reason, he said, why the contractor threw up the contract was that he found that if he carried it out he would be ruined. He saw that ruin stared him in the face if he carried it out, and so he threw it up, but that he had no right to do. There was no ground tenable in law on which he could throw it up, and he had thrown it up for a reason on which the law did not allow him to do so—that is, on a demand that it should be modified. Lord Justice Kay also was of the same opinion. Though, he said, he had the greatest possible sympathy with the contractor, he saw no ground on which it was possible to relieve him, as it was clear that he had made up his mind to throw it up unless it was modified. Judgment for the corporation affirmed and appeal dismissed.

STATUES, MEMORIALS, &c.

DUBLIN.—Two works by Mr. Albert Bruce Joy were unveiled at Dublin last week. The first was a bust of the late Provost Lloyd in Trinity College, and the second a bust of the late Dr. Robert McDonnell in the board room of the Royal College of Surgeons.

The National Provident Bank of England, Newport, Mon., is being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke flues, the same being supplied by Mr. E. H. Shorland, of Manchester.

At the Poplar Cottage "Hydro," Matlock Bank, a new wing has been added to the premises, comprising thirty bedrooms, a large drawing-room, and a billiard room. About fifty workmen and invited guests sat down to a splendid spread at the finish, the chair being occupied by Mr. Jesse Davis, and the vice-chair by Mr. C. Newbold, of Belper, the architect of the works.

Our Office Table.

THE retubing of the streets for the electric lighting by the City of London Electric Lighting Co. is a slow and most inconvenient process, which the patient London citizen has to endure as well as he is able. The tubes or channels are of different kinds—one is of triangular-shaped section, made of a bituminous composition, bored by three apertures; the others are iron tubes of different diameters, and these are packed close together and laid in a trench below the foot pavement. But the points to notice are the twists and bends that are required to clear the gas and water-pipes and other connections to the houses, and the necessity of having to bend the channels and tubes out of a straight course—a labour that absorbs time and greatly inconveniences pedestrians. Why not lay down brick or concrete channels, and cover them in a manner that they can be opened and closed expeditiously?

Those who knew Arundel-street, Strand, but a few years ago will be surprised to see the transformation that has taken place. It is now lined by a row of stately blocks of offices and chambers of red brick and terracotta, and architects who come up from the country and wish to see the progress made in terracotta-architecture, will find a variety of design in Arundel-street; bays recessed and projecting, mullioned and traceried; arcaded treatments of façades, pilasters, corbels, and gables, and chimneys and every kind of relief ornament. The workmanship and jointing of the arches and mullions are in some instances very superior. Surrey and Norfolk-streets will no doubt soon follow the example, when the new thoroughfare contemplated from the Strand to Holborn has been decided upon.

SIR E. W. WATKIN writes to the *Times* in support of his scheme for a tunnel to connect Ireland and Scotland. He says:—One great thing they (the Government) could settle—a question more important to Ireland, as it seems to me, than a dozen Home Rule Bills—a question which can be discussed quite apart from Home Rule controversies—I mean the restoration of prosperity and progress by great, but simple, public works—the leading works being (1) a ship canal of capacious dimensions between the west and east of Ireland, and (2) a tunnel from the north of Ireland to the south of Scotland. The former would place Ireland on the shortest sea-road to all the great West, and to the East via the Canadian Pacific Railway, and the latter would make Ireland and Scotland one country. Surveys and discussions to which I and others have for years been parties have demonstrated the feasibility of both projects, and the most liberal estimate for both does not exceed £20,000,000, which at 3 per cent. 99 years' terminable security would amount to a burden of £600,000 a year for 99 years, or about a fifth of the cost of keeping a hostile force in Ireland. I shall be happy to show to any one the plans and sections of a canal across Ireland prepared for me under the charge of the late Mr. T. A. Walker, who constructed the Severn Tunnel, and most of the Manchester Ship Canal.

In a paper read before the Washburn Engineering Society of Worcester, Mass., Mr. E. F. Miner gives results of some important experiments on the holding power of anchor bolts in stones. For the purpose of the experiments tap bolts were prepared 1½ in. in diameter and 9 in. long, with a thread 6½ in. long, and were set into the stone 6 in. The holes in the stone were as nearly as possible 2 in. in diameter and 6½ in. deep, but in three of the experiments they were tapered to a diameter of 2½ in. at the bottom. Using an inferior grade of Babbitt metal, the bolt came out 1½ in. under a load of 10,000 lb., due to the stone and metal coming to a fair bearing. At 15,000 lb., however, it drew ¾ in. out of its setting, and at 16,000 lb. the stone split. With lead setting, the lead being melted and poured round the bolt resting in a tapered hole, an extension of ¾ in. was noted under a load of 2,500 lb., which did not increase till the load was raised to 5,000 lb. Above 6,000 lb., and up to 13,000 lb. an extension of 1½ in. for each 1,000 lb. was observed. Putting on power, the load was then rapidly raised to 33,000 lb., when the lead gave way. With lead pipe setting in a straight hole, an extension of ¾ in. was noted at 4,000 lb., which did not increase till a load of 5,000 lb. was reached,

but beyond this each successive increment of load produced an extension. On applying power the load was raised to 5,000 lb., when failure occurred. The best results were, however, obtained with sulphur setting. Thus in a straight hole with this material no yielding whatever was noted up to a load of 10,000 lb., above which, however, it was perceptible, though up to 29,000 lb. it was only ¾ in.; beyond this no measurements were taken, but at 31,125 lb. the stone split. The fragments of sulphur from the broken stone showed no signs of crushing. With the same material in a tapered hole no movement of either bolt or setting was observed up to a load of 20,000 lb., but on leaving this load on for five minutes, an extension of 1½ in. was noted, which, however, did not increase during the rest of the experiment. At 29,000 lb. one of the iron clamps cracked off a corner of the stone, and at 31,515 lb. one of the iron straps holding the stone broke and ended the experiment. With the metal settings there was a very perceptible movement of the setting under a low load, which was probably due to the contraction of the metal on cooling.

In his annual report to the town council of West Hartlepool, Mr. J. W. Brown, the borough surveyor, says the officials have been in considerable tension in endeavouring to keep abreast of the works rendered necessary by the extraordinary road development. Since Mr. Brown's appointment in 1884, nearly one hundred streets, or portions of streets, have been constructed, the population has increased from 30,000 to about 44,000, and the rateable value by over £30,000. Much activity has been displayed, he says, during the year in the building trade; 211 dwelling houses have been certified for occupation, as against 129 in the previous year. The total number of new houses, alterations, and additions, erected and made during the year, is 396, as against 179 the previous year. He has asked the town council to appoint a building inspector, remarking that he knows of no other town where the increase of the population is so rapid where they have not such an official.

The Mayor of Plymouth (Mr. F. W. Harris), in his presidential address to the second annual meeting of the Devon and Cornwall District Council for the National Registration of Plumbers, held last week at the Plymouth Technical Schools, said he was glad to know that they were determined to discourage all tinkering in the plumbing trade. Let them endeavour to do their work in an expeditious and thorough manner, and their employers and those who employed them, through their masters, would desire that they should be sent where important work was needed. They were now recognised as one of the most important trades, and the public generally were beginning to see and to feel that good plumbing was necessary, and he did hope that each one of them would take pride in his work. He was going to say, and he thought he did say, when he was there a few months ago, that it was being looked upon as a profession, and if they would just feel that each one of them was engaged in a trade that was fast becoming a profession, it would lift their thoughts and actions, and they would feel that they were very important persons. In the Council's annual report read at the meeting it was stated: The Council believe their present register is, on the whole, very fair to the qualified members of the trade, and a guarantee to the public that those plumbers in Devon and Cornwall who are entitled to assume the letters R.P.C. are trustworthy and competent tradesmen. There is every reason to believe that as the public becomes better acquainted with the movement the benefits of the registration system will be so apparent that those persons holding certificates will be selected in preference to others not so qualified.

In response to an appeal from the North of England District Council for the National Registration of Plumbers, the County Councils of Northumberland and Durham have decided to afford facilities for a few operative plumbers, selected from different centres in the two counties to attend the special course of instruction in the "Principles and Practice of Plumbing," which will be held at the Durham College of Science, from Monday, August 22nd, to Saturday, September 10th. The object of the course is to train duly qualified plumbers in the methods of teaching, in order that they may eventually conduct classes in their own localities for the benefit of apprentices who are working

for the examinations for registration under the Worshipful Company of Plumbers. From the two counties twelve men will be selected, and will probably receive an exhibition not exceeding £5, to cover their expenses during the three weeks and free admission to the course of instruction.

THE total amount realised by the sales at the London Mart during the half-year ending the 30th ult., according to the *Estates Gazette*, was £2,384,172—a sum greatly in excess of the amount realised during the same period of the previous year, when the figures were £2,022,951. In the year 1890 the amount reached was £2,047,518. While the number of freehold houses in London have decreased, the sale of leaseholds has increased by over 600. Building plots in the suburbs, and especially those near railway stations, have been more in demand, and amongst the miscellaneous sales some very high figures have been paid for public-houses, although the purchasers will have to wait several years before they obtain possession of them.

A CORRESPONDENT of the *Iron Industry Gazette* says:—Tools, like men, grow "tired." I have seen a first-class chisel get "tired," and act as though it was possessed of the King of Sheol. It would not keep its edge, and the more I sharpened it the sooner it would lose its edge. I called the attention of a shopmate, a grizzled old veteran, to the peculiar behaviour of the chisel. He looked it over and handed it back to me, saying, "The tool is all right, only a little tired. Lay it away, and let it rest. It will come out all right again, just like a man who is tired. I did not believe the old fellow, and I really thought he was crazy to talk of a tool getting tired, but as there was no help for it the tool was laid away. I do not remember how long it was left to "rest," but when it was again sharpened and used it appeared to hold its keenest edge as well as it did before it got tired. Barbers tell me their razors in constant use get tired in the same way, and wood-choppers say their axes sometimes seem to get "soft" all at once. Possibly constant and hard usage may cause changes in crystallisation that would account satisfactorily for the peculiarity alluded to. Locomotive engineers often observe peculiar misbehaviour in their machines, which may possibly be the result of continued heating, friction, and pounding. When a tool gets "tired," or a machine "bulky," give each a rest.

THE Chairman of the Committee of Improvement of Highways of New York is offering three prizes for the best three essays by European engineers on "The Practical Construction and Maintenance of Country Roads." The prizes are respectively £21, £14 14s., and £6 6s. The articles may be written in English, German, and French, and may contain not more than 20,000 nor less than 8,000 words. Good illustrations, either drawings, engravings, or photographs, will be especially important. The essays should be sent to the chairman before the 31st December next, and the prizes will be awarded on or before March 1st, 1893.

THE new harbour works at Dover are to be commenced next week, the conditions under which the contract for £400,000 was accepted last week being that the work should commence within 14 days. The construction of the eastern arm is expected to take six years, during which it is estimated that £20,000 a year will be spent on labour alone, as all the concrete blocks will be made at Dover. After the construction of the eastern arm, a breakwater will be built, and the harbour will then accommodate the largest liners afloat.

MR. H. DAWSON BARKAS, Head Master of the Reading School of Art, has issued a pocket manual for students, giving suggestions of an elementary kind, and furnishing hints for the use of those learning shading from the cast. The letterpress is arranged in the form of questions and answers, and marginal illustrations accompany the text as practical demonstrations of the rules laid down. The author claims for his method that it is calculated to lead the student to think and exercise those powers of observation in matters of detail which will conduce to a truthful representation of the objects he studies, both in *realism* and *appearance*. Materials and apparatus, ever dear to the beginner, are illustrated and described, as well as the methods of applying them. Light and shade, contrast, technique, cast shadows, and local tones are decanted upon, and then follow a

series of sketches and more finished studies compared. This technical pocketbook seems well adapted for school of art pupils and all students learning to draw on South Kensington methods.

WATER SUPPLY AND SANITARY MATTERS.

BURSLER.—Last week Mr. R. Walton, C.E., held an inquiry at Burslem into the application to borrow £9,000 for the erection of public baths, £5,000 for the purchase of land for the purposes of public walks and pleasure grounds, £3,750 for purposes of street improvement, and £1,600 for purposes of sewerage works. Mr. F. Bettany, the borough surveyor, stated that the site of the baths was in Moorland-road. The plans included two swimming-baths, one having a water area of 60ft. by 30ft., and a capacity of 50,000 gallons, and the other 73ft. by 33ft., holding 69,600 gallons. Sixteen private baths would be provided, 12 for males and 4 for females. Extra care had been taken to insure superior Turkish baths, which it was generally admitted had become a necessity to the working potters. The various fittings and appliances of the baths would be of the most improved patterns. The council had been long desirous of providing a recreation ground for the town, and in consequence of inquiries after a suitable site, Messrs. Wood, who gave the site for the baths, offered them a decided bargain. It was a piece of land in Moorland-road, 52 acres in extent. They put a value of £6,000 upon the land, but offered it at £5,500, and intimated that £500 of this sum might be considered as a contribution towards the cost of laying out the ground. With respect to the street improvement loan, the town clerk explained that the council had purchased certain property which had come into the market, and it would enable them to effect a most desirable improvement. A portion of the land had been since re-sold by the council to Mr. Dobson for £2,600, leaving £1,050 to be paid on the original purchase, and £100 further was required for laying out the road and footpaths. The £2,600 would not be paid until Dec. 26. The last question inquired into by the inspector was a proposal to lay an intercepting sewer, at a cost of £1,600, to divert the sewage of the Pinnox Estate, Brownhills, from the Foulhay Brook. The town clerk said the County Council had pressed this work upon them in order to keep the Foulhay Brook—which was a tributary of the Trent—free from pollution. There was no opposition to any of the proposed loans.

Trade News.

WAGES MOVEMENTS.

BOLTON.—The lock-out in the Bolton building trade is at an end, and the men resumed work on Tuesday. The plumbers struck ten weeks ago on the question of winter hours of work and allowances for country work. The Masters' Federation have conceded that in winter the men should commence at eight in the morning, as against seven in other months. The other matters in dispute are referred to arbitration.

THE CARPENTERS' STRIKE AT BELFAST.—The London carpenters and joiners have unanimously decided to make a levy that will realise at least £350 per week, in support of the carpenters and joiners on strike in Belfast, such levy to be continued until the termination of the strike.

STATE OF THE SKILLED LABOUR MARKET.—The memorandum prepared for the *Board of Trade Journal* by the labour correspondent to the Board of Trade states that during June industrial conditions have been less disturbed than in the month preceding. Neither in point of number nor of importance have disputes been so serious, and there has been a falling off in the number recorded from 93 in May to but 59 in June, while the number of persons involved is only about one-third of the previous total. The trades at present furnishing the larger proportion of these stoppages of work are the textile and building trades. In the textile industries 15 strikes have taken place during the month, but these are not of much importance. The building trades of all branches have been unusually active, and are responsible for 12 strikes, while many movements for increased wages or lessened hours of labour have been arranged without cessation of work. Dock labour and ship-building trades are, on the other hand, accountable for six and five strikes respectively, most of which are defensive rather than aggressive in character. There have also been nine among coalminers, and the balance are spread over miscellaneous industries.

TAUNTON.—The carpenters and joiners of Taunton have resumed work after having been on strike for ten weeks. They demanded 6d. an hour, being a rise of 1d. The masters offered 5½d., with 6d. next year; but this the men declined. The men have now accepted 5½d., with a promise of the additional farthing next month.

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TENDERS.

*. Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

BIRMINGHAM.—For erecting eleven cottages at Strichley-street, near Birmingham, for Mr. A. R. Gibbs. Mr. Francis B. Andrews, A.R.I.B.A., architect:—
Grant, H., Selly Oak £2,269 0 0

BIRMINGHAM.—For erecting twenty-seven cottages in the Elm Tree-road, Strichley, near Birmingham, for Mr. Grant. Mr. P. A. Blenkam, architect:—
Grant, H., Selly Oak £3,750 0 0

BROMLEY, KENT.—For works of kerbing, channelling, paving, &c., in Oaklands-road, for the Bromley Local Board. Mr. Hugh S. Cregeen, surveyor:—
Hudson £1,316 13 11
Lansbury, T. 1,294 19 6
Mowlem and Co., J. 1,175 0 0
Peill Bros. (accepted) 1,141 5 0
Surveyor's estimate, £1,289 13s. 4d.

BUSHBY, LEICESTERSHIRE.—For the erection of a residence, for Mr. J. E. Kirby. Messrs. Miles and Beasley, Leicester, architects. Quantities by architects:—

Blair, T., and Son	£3,470 0 0
Bentley, S. and H.	3,419 3 11
Tyers and Yates	3,254 10 0
Hutchinson and Son	3,244 13 0
Clark and Garrett	3,234 0 0
Mason and Sons	3,179 0 0
Sharp and Neal	3,172 8 0
Herbert, T. and H.	3,165 0 0
Chambers, H. T. and W.	3,155 0 0
Kellett, J. C., and Sons	3,090 0 0
Brown, G.	3,059 16 0
Jewsbury, J. O. (accepted)	2,996 0 0
All of Leicester.	

CROSSMOLINA BRIDGE.—For three-span (37ft. each) steel plate girder bridge, with masonry piers, abutments, &c., for the Grand Jury of the County Mayo, not to exceed £3,500. Mr. Wm. Patterson Orchard, B.E., county surveyor, North Mayo, engineer:—

Somerville and Co.	£4,835 0 0
Dillon, J. B., Ballina	3,478 19 4
Thorn, A.	3,410 0 0
Findlay, A., and Co., Motherwell*	3,373 9 0

* Accepted.



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THE BUILDING NEWS, JULY 22, 1892.

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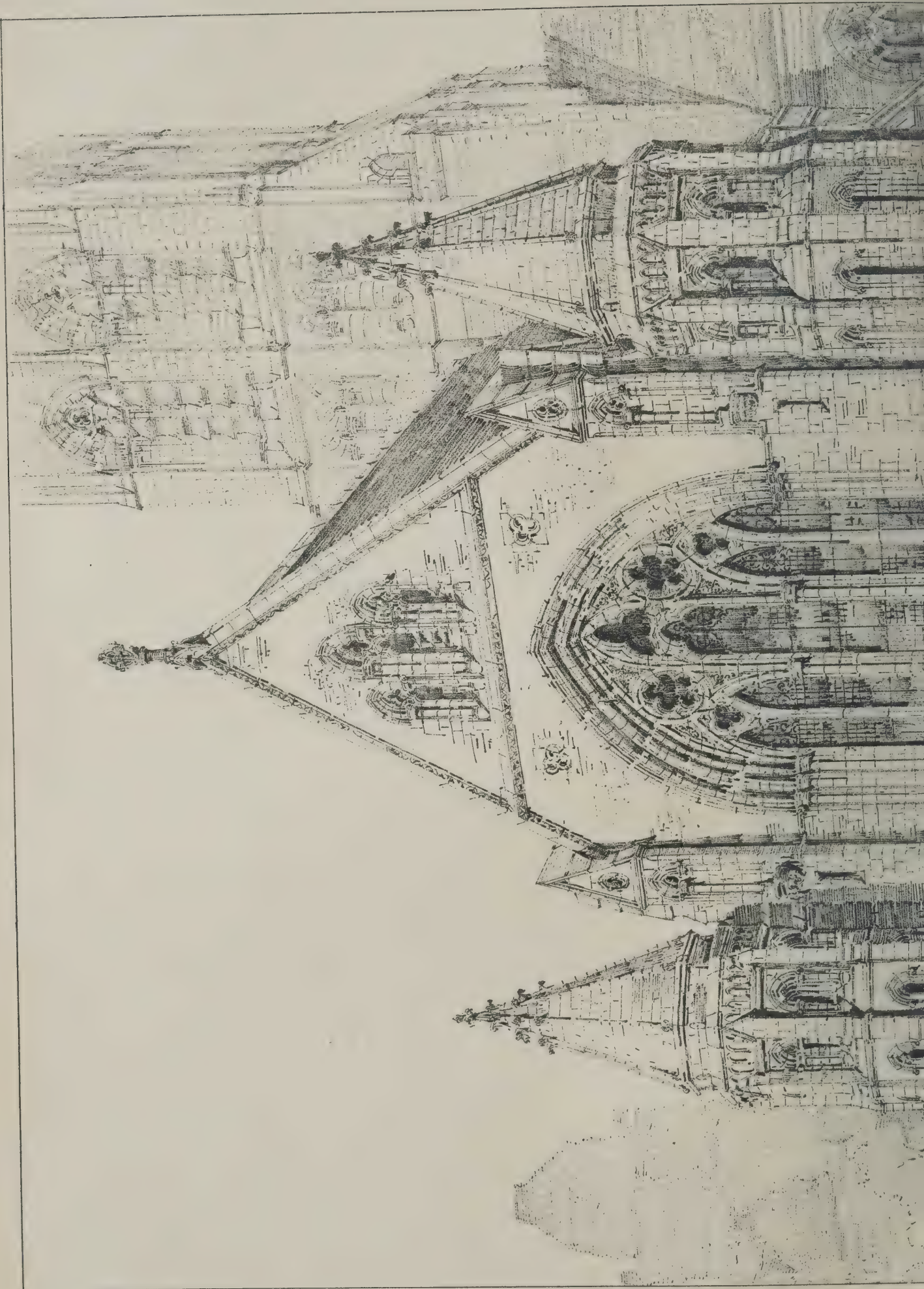
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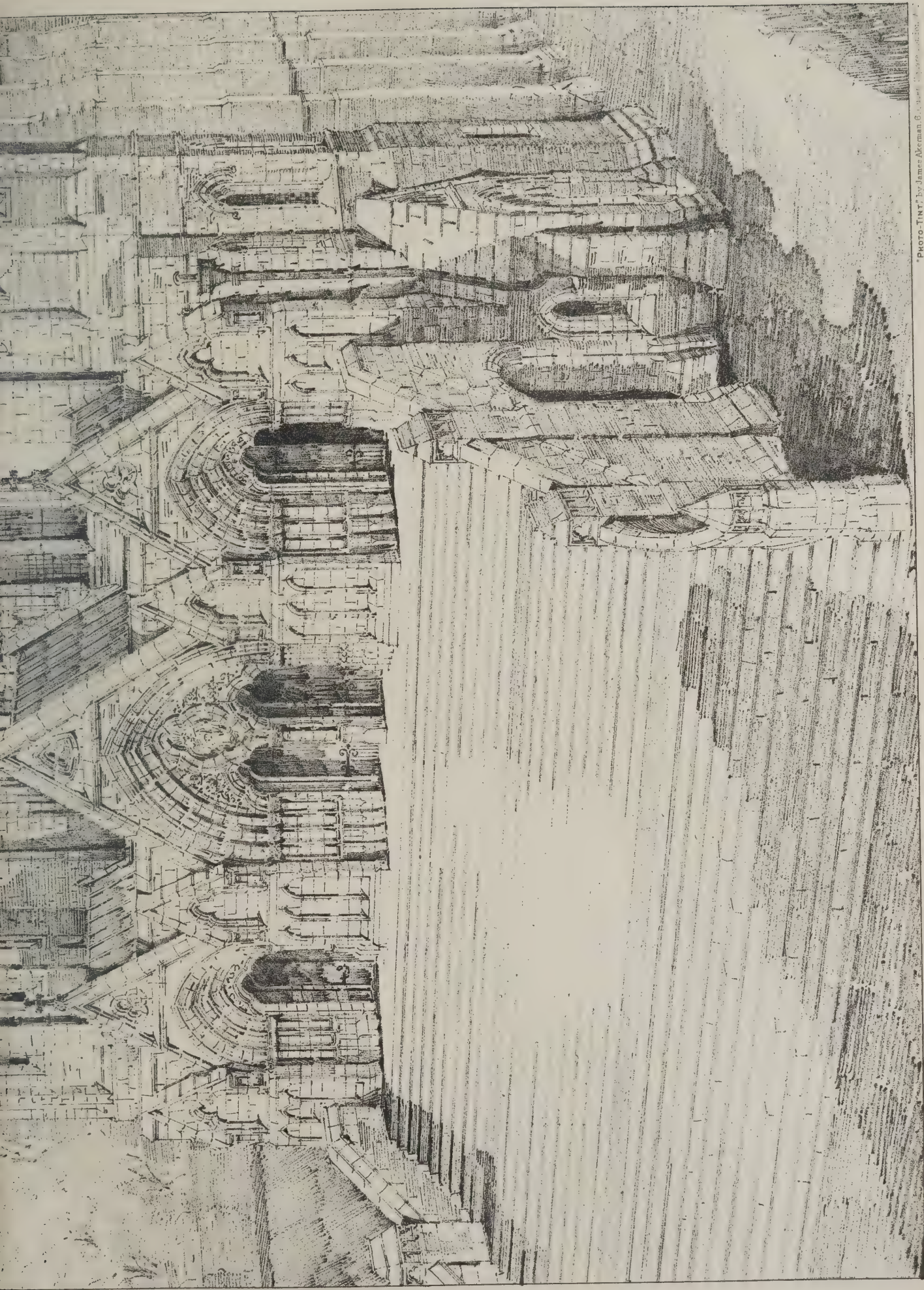
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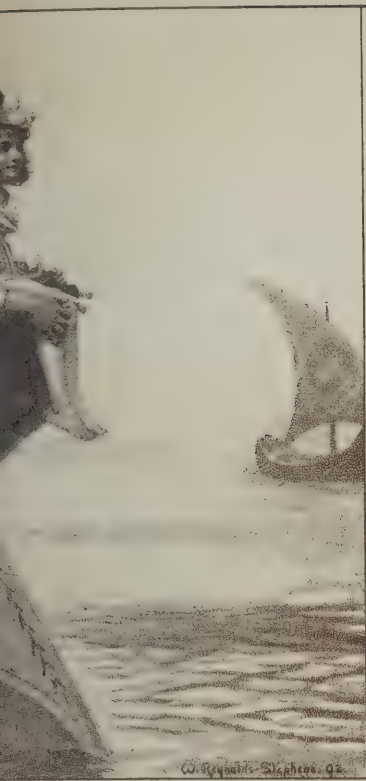


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"ROSA MYSTICA" BY J.R. SPENCE.

THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1960.

FRIDAY, JULY 29, 1892.

THE CLIENT AND THE ARCHITECT.

THE business transactions between owners, builders, and tradesmen which the ordinary practitioner has to conduct are so varied and numerous that it would be beyond the scope of an article like this to discuss them. We say the "ordinary practitioner," because architects who stand at the top of the profession have of necessity very little to do with business details, these in the main being left to their chief assistants, to the clerk of works, or solicitor of the client. In the natural order of things the professional man is first consulted; to him the client confides his proposals, the limits of expenditure, and it is for him to suggest the ways and means and method of proceeding. He has, therefore, the "key" to the position, and the question may be raised here whether he uses it with discretion. Too often the position is compromised or quite lost beyond recovery. All that is thought about is the instruction and the commission; the mode of carrying out the design does not trouble, it is a matter of routine; the whole transaction is arranged in a perfunctory sort of manner. The client fancies his architect knows what he wants; the latter thinks whatever he does will be acceptable. Here the first mistake is committed. Very different ideas possess the minds of each probably; the building owner has no very clear conception of what he wants, and probably the most crude and elementary ideal of a building is in his mind's eye. Of course the misunderstanding is unfortunate, and must in the course of the work render negotiations difficult. A little more tact may be exercised by the architect at this stage. He may draw out his client's views on paper, or if this is impossible, owing to his client's incapacity to express his want, an actual example may be pointed out. Example may be better than precept, for opinion may change and can be denied, but an actual building is in evidence. Even with a working example before one's eyes, it may be desirable to make particular note of any deviation that the employer desires. The size of rooms and their finish ought to be pointed out, and the differences defined, or the impetuous client, especially if a lady, may declare that the model has not been carefully followed, or that the new building is inferior. Definite instructions upon questionable points put into writing would save an immense deal of trouble. Upon these data the architect might proceed to make his plans with confidence. How often do we hear the remark about a suggestion that has come from the employer, but is disappointing in execution: "Oh, yes; but I left you to advise me—I did not know the effect," and after the architect had strongly advised another plan. If any definite instruction is given after the evil has been pointed out, it ought at once to be reduced to writing.

From the question of estimates the architect naturally shrinks. However rough or approximate an estimate may be, it pledges him to an outlay which may not be borne out, and yet it is a question which cannot be hoodwinked. It is a custom nowadays to know the cost: it means so much capital extracted from the business or the revenue of the employer. No doubt, from a purely professional point of view, it appears unnecessary to require the cost of building, when the absolute requirements are fixed and a properly-prepared bill of quantities

is made out. No responsible agent would allow his employer to pay one shilling more than is necessary for the due execution of the work. No lawyer or medical practitioner is asked beforehand how much his fees will be or the costs of an action. Why should an architect alone, of all professional men, give any guarantee of cost? On the other hand, the expenditure in building is generally much heavier, and there are often quite as many leakages and contingencies as there are in law proceedings and taxation, and these are expenses which the employer expects to be prepared to meet. How to prepare approximate estimates of cost that may be relied upon is not a duty that forms any part of the young architect's curriculum. All he can do is to "cube," or lump together, the trades. Possibly someone who has made estimates and quantities a special study may some day propose a more exact scheme of estimating on calculated results of existing buildings than that of taking the floor area, or the foot cube, or some other unit. Only the practical man is able to form an estimate by taking the quantity of brickwork in the lump, and the flooring with approximate accuracy, and roofing by the square, for such a wholesale mode of taking the materials and labour is rather risky. The price per unit can only be obtained by a careful analysis and experience of local labour. Whatever may be the trouble in acquiring the art of estimating, we cannot underrate its importance, both in giving confidence to the employer, and in being a useful guide to the architect. The practice of under-estimating is one to be reprehended in a professional man who has no gain to make out of the building, except it be in the shape of his commission, and as this has to be added to the cost, it is safer and more honest to state a sum that will cover it. The tender comes in afterwards, and if the lowest exceeds the architect's estimate by a large amount, the owner at once thinks that his architect has been misleading him. Far better that the estimate should be in excess of the lowest tender, or even of the highest, as then it enables the architect to recommend the acceptance of a builder who will do justice to the work. Nothing is gained by appearing to accommodate oneself to the situation, of satisfying the owner's parsimony at the real expense of effectiveness, of, in short, "holding with the hare while running with the hounds." The shilly-shally policy is dangerous, and has never been found to answer in transactions of this kind.

It is at an early stage of the architect's engagement that he should endeavour to make some agreement between himself and his client. The general idea is that the building contract is enough, that it binds all three parties, that the clauses framed by the architect or legal representative can be made sufficient to bind the employer to the acts of his architect, and although this is true up to a certain point, we have constant evidence of disputes between architects and their clients as to deviations, extra work, and especially as to the granting of certificates, questions which the Courts sometimes construe very differently to the intention of the framers of those documents. The law sometimes regards a clause as unreasonable, and the client may decline to be bound by any decision given by the architect in favour of the contractor as provided for by the arbitration clause. For these reasons an agreement between the architect and his client is necessary. The document should state distinctly what the architect agrees to do, in short, what his duties are, the amount of his commission, how additional expenditure or extras are to be paid for, the mode of payment, whether the plans are to be retained by the architect or not, his power as arbitrator in case of disputes with builder, and any other special matter. Or if

an agreement is not made, the architect should write a letter to his employer in which these questions are set forth. In the absence of any objections on the part of the client, the letter would possess the binding effect of an agreement. We do not think this mode of settling conditions is often adopted, perhaps through an idea of offending the owner; but any letters written at this initial stage might be made useful in the way we have indicated. Simple statements of what the architect intends, if left unanswered, remain as terms of an implied contract. Thus an architect can incidentally mention how the clerk of works is to be paid, the terms of payment to the quantity surveyor, the fees payable in respect of professional services if the work is not commenced within a specified date. These terms may merely recite what the client and architect have verbally agreed to at interviews with one another without taking any formal shape liable to give offence. Too much is left in ordinary transactions to the mutual good faith of the parties, and to verbal understandings. Alterations to plans and specifications are made without the signature or assent of the client in writing, and upon this very fluctuating and worthless sort of evidence the work proceeds, till some unhappy difference makes it only too obvious that client and architect have not understood one another upon questions of vital importance to the carrying out of the contract.

NATIONAL COMPETITION OF SCHOOLS OF ART.

THE designs and drawings which have received medals and book prizes are now on view in the galleries at South Kensington. Eight gold medals, 49 silver medals, 140 bronze medals, besides 340 book prizes, are awarded in addition to the honorary awards to students of the training class, while the number of works sent for examination comprises 50,311 from 251 schools of art and branch schools, 41,306 from 309 science schools, and 16,785 from 333 art classes. Of these, 3,217 works have been selected for competition. The recipients of the gold medals represent Birmingham, Canterbury, Clapham, Glasgow, Leicester, and South Kensington, and only one student, Charles R. McIntosh, of Glasgow, gains it for an architectural design, namely, for a chapter-house. This design was submitted, under the motto "Griffin," among others, for the late Soane Medallion prize, a notice of which competition we gave in our issue of Jan. 22 last, page 122, Vol. LXII. Mr. McIntosh's design is octagonal in plan, and is of the Italian Renaissance character. The drawings treated exhibit considerable skill and taste, and the details are commendable.

Amongst the special architectural designs we must mention those for a church. James H. Tonge, of York, whose work we have before referred to, is awarded a silver medal for a design of considerable artistic ability in a Late French style, and showing some quaintness of treatment in the two porches at the south transept and western end. The windows have circular heads filled with Late tracery; the plan of five bays, with tower, transepts, chancel and ambulatory, morning chapel, &c., is carefully disposed and proportioned, and there is a porch and tower vestibule at west end, and cloisters along the south side. The tower is shown finished with a low parapet, and the east end and transepts are treated with artistic feeling. The ink drawings and study of a side of chancel show a master's hand, and the cross-section exhibits a double wall with clerestory arcing instead of the usual lean-to arrangement.

W. Carter and Ernest H. Bird, also of York, receive bronze medals for a town

church design: the former has an octagonal-ended apse, and with details of Late Gothic. The drawings are well executed, and a low unfinished tower at west end is shown. The second is also of similar character. With the exception of faults of detail and construction and a want of proportion in the lights, these drawings indicate a more rational instruction in church design than formerly, and a marked advance upon the elaborate and grandiose cathedral craze which we have been accustomed to see in these annual competitions, and have from time to time reprobated as a subject for students.

Henry Mitchell (Glasgow) receives a bronze medal for a Classic steeple, which we did not see. The examiners say that the 5ft. walls of the upper part are needlessly heavy—they bear on arches which would be unsafe. The large circular-headed windows of the lower part are also said to be too large, the reversed console termination of buttresses is inartistic, and a too high point of view (80ft. above ground) is chosen. A design for a public day-school, by John H. James, Cardiff, wins a silver medal. A Late Gothic brick and stone treatment, with tower and entrance, and a plan disposed round three sides of a playground, characterise this design, which would be certainly better with a less conspicuous tower, if one were wanted. The same prize is awarded to W. Jones, Leeds, for a design for a pair of cottages for a mountainous district, stone and timber being the materials used. They are semi-detached, and the plan good. The porch at the corner with single column is very effective. A design for an artist's house, by Heber Rimmer, Chester, whose work is always pleasing, receives a bronze medal for a clever Late Gothic treatment, well grouped with wide window-bays, and having some good points in the plan; but the hall is large, and the office block rambling. The gallery is badly lighted. A museum and art gallery, by Eric A. Sutherland, Glasgow, takes a bronze. It is rather heavy Classic; but the plan is suitable; the same medal also goes to a Sydney Technical School student, R. E. Nancarrow, for an Australian residence in a Palladian style, with verandahs or arcades and a low roof. These attempts show an appreciation of Italian architecture, and it is evident that the New South Wales architects are partial to Classic. Other designs not exhibited receive book prizes. In a country subject to great heat the verandah has been found a valuable addition. It is a pity a more picturesque and pliable style has not been introduced; but the materials available have not been as yet passed through the crucible of an inventive artist's mind, and are still in the hands of those restricted to the schools.

The measured drawings are rather poor; the subjects chosen in many cases are not of sufficient merit to copy, and there is a want of practical knowledge in the details, such as jointing of masonry and mouldings. A silver medal is won by Ernest W. Light, Winchester, for measured and coloured drawings of the Norman font in Winchester Cathedral—a very fine example of Norman *circa* 1129, with elevations of the four sides and the sculptures in relief; also by Archibald Knox, Douglas, for set of drawings illustrating chapels and other historic remains, of Celtic crosses and their ornament, commended by the examiners. Another is awarded to John L. Smith, Birmingham, for drawings of Aston Hall, the side entrance and details of staircase; and a third medal to Benj. J. Fletcher, Leicester, for drawings in India ink and pencil of church door of St. Maclou, Rouen, showing the carved panels and bronzes executed by Jean Gougon. Bronze medals are given to Ernest R. Davis, Leicester, for some rather poor measured drawings in pencil of buildings; to W. F. Edwards, Birmingham, for wall arcing and crocketed pinnacle to Lady-chapel,

Lichfield Cathedral; to Harry P. Clifford, Rochester, for carved oak fireplace from Eastgate House; to C. J. Hair, Peterborough, for window in Claypole Chapel, Northborough Church, N. Hants; to Chas. Holloway, Nottingham, for drawings of Brant Broughton Church, Lincolnshire. Book prizes are awarded to Herbert Barkas, Reading, for a carved old oak screen in Hurst Church of the 16th century; to W. H. J. Allen, of same town, for screen in Warfield Church, Berks.

In the designs (stage 23c), Gertrude Roots, Canterbury, a well-known lady designer, takes the only gold medal for a mosaic pavement, a design marked by an artistic arrangement of Byzantine motive and harmonious blending of colour of a low key. Amongst other bronze-medal designs we must name that of Ella B. Ginn (Hertford), for wall-tiles and a Persian arrangement by Charlotte Trower, of same school; another tile panel by Edith Aird, Canterbury, nice in colour (blue and yellow); a clever pattern (349) by a Hertford student. The wall papers are not satisfactory. The silver medal is given to Robert Dow, Glasgow, for a printed hanging of a much too naturalistic kind. There is no attempt made to conventionalise the animals, birds, and foliage on the green ground, and a want of ornamental arrangement is evident. Mary M. Hastings, Chelsea, has a design for surface decoration, fir-trees, cones, and bats, cleverly treated for colour; a bronze is awarded. G. Anderson, Coventry, takes the same prize for a wall-paper design, boldly treated, with birds introduced. The designs for these purposes show that their authors have not yet mastered the essential principles of ornament when applied to flat surfaces, and the natural forms introduced in many of the wall papers show a loss of sight of their ornamental characteristics, or those peculiarities which ought to have been turned to account by the artist. Birds and other animal forms should be more cautiously introduced. We must notice a clever wall fountain and glass mosaic panel in marble by C. Oppenheimer, of Manchester, which only takes a book prize. Designs for decoration of rooms are very inferior. A. Norris, Sheffield, sends an over-panelled treatment, and the billiard-room decoration by a Manchester student is commonplace.

Carpets and cretonnes is another group which shows a falling off in quality. A bold peony pattern with leafage is shown by W. E. Sands, Nottingham, for a cretonne, and wins a bronze medal. Agnes Farman, Leicester, has a design for a stair carpet in which the running centre pattern of foliage is clever, which takes a bronze medal; and a Macclesfield student, F. H. Smith, shows a harmony of colour and a clever centre pattern or filling. In cotton and silk hangings, a silver medal is taken for a silk damask by E. Preston, and there are a few conventionalised and clever designs, such as that of Mary Mohun, Canterbury, which displays an artistic discernment in the entwined lines. A bronze medal is given. Canterbury is to be congratulated on the number of students that have taken gold and bronze medals for designs—all lady students. A Blackheath student also sends a clever treatment (76).

The designs for pottery include a design for a plate, by Flor. Morris, of Hertford School, especially the border, the centre squirrel is too naturalistic. It receives a silver medal. The border is skilfully designed. Edith Thorp also wins this prize for a painted plaque Classically treated. The designs by J. B. F. Hiles, of the Training Class, South Kensington, are well worthy of the silver medal. His ewer and dish are graceful and Classical in taste, and it may be worth mention that this student has lost his arms and legs, and has to design and draw every-

thing by a pencil placed between his teeth. Another ewer and dish, by C. Ripper, may be noticed for its gracefulness in outline.

The designs for ironwork are not numerous. A silver medal goes to a set of cleverly-drawn designs for signs in wrought iron and copper, and a series of gates and grilles of different styles by H. Pepper, and a bronze to B. Fletcher, Leicester, for a newel and baluster in wrought iron.

The design for a panel of cabinet by W. M. B. Kean, Leek, illustrative of the "Lady of Shalott," in water-colours, is an artistic work, and displays a poetical feeling in the drawing and colour worthy of the great poem of Tennyson. The designs for book illustrations, Christmas and invitation cards are worth attention. Gertrude Bradley and Winifred Smith, Birmingham, take the gold medals for illustrative designs for children's nursery books and verses, and silver medals are awarded to Agnes Manley and Mary Jane Newill, of the same school, for some clever book and card illustrations. Other students of the school take bronze medals, amongst them F. Mason and Florence Rudland; and we must also mention the clever designs for stained-glass windows, figure subjects, and skilful border by Mary J. Newill. Other designs and drawings we must reserve. The examiners of the architectural designs are Professor G. Aitchison, A.R.A., T. G. Jackson, A.R.A., Mr. J. Stevenson; and W. Morris, Lewis Day, Alan S. Cole, and F. Shields are the examiners in the other designs.

JAPANESEQUE.*

I HAVE been very severely and very properly called to order by the learned Secretary of this Institution for coining a new word, "Japanesque," to meet the exigencies of the occasion of my appearing before you. But the word "Japanese" has already three uses. It is both singular and plural, applying to one and to all the inhabitants of Japan; and as an adjective it is applied to the products of the islands, connoting probably some slight idea of artistic excellence. I could not very well append to these a fourth use, applying it to things in the Japanese style, to things "Japanesque" in fact, because, as I shall endeavour to show you this evening, it could not in such use connote any idea of art at all; it would, on the contrary, connote a great deal that is terribly inartistic. Therefore, again craving your pardon for having coined it, I will use the word Japanesque to signify, not the European facsimiles of Japanese work, which are indeed fairly well executed, but a certain bastard form of ornament which has seized on our art wares, and which has derived some sort of inspiration from Japan. The history of the rise and progress of Japanesque is well-known in the potters' trade: I believe that the precise date of its first appearance has been chronicled on the sherds which form the archives of that trade. For this reason my examples of Japanesque will be drawn from plates, the decoration of which indeed, holding as they do no unimportant place among our household gods, is a matter of considerable interest. But it will probably not be necessary for me to point out that the potters having once set the example, as indeed they have done in decorative art through many centuries, Japanesque has been adopted by the carvers, the weavers, the broderers, and the candlestick-makers. I shall endeavour to point out to you the chief points in which Japanesque misses the mark, commits unpardonable sins against the art of Japan. If I should conclude with a panegyric on that art itself, I trust you will find me sufficient excuse. Here are some Japanesque plates, the designs upon them are as far removed from Japanese as this Island of Fogs which has produced them is from the Islands of the Sun. And yet, no one who is familiar, as who amongst us is not, with the crude formalities of true Victorian decoration, with the parodies of the Renaissance grotesques with which so much of our street architecture is plastered, no one but can fail to discern in these extraordinary designs

* A paper read before the Royal Institution of Great Britain by Mr. F. T. Pigott.

a striving after something new, an effort to be original, a desire to shake off the fetters of formalism and pseudo-classicism. You will not need, I think, to be reminded that these plates are fair samples of a species of art-work with which we are now familiar; nor will you fail to recognise the cause which called these artistic strivings and desires into being. A light had dawned suddenly on British artists in design, at a time when they were beginning to weary of the stencil plates and tracing-papers which are the handmaids of formalism. That light dawned from the far Eastern islands of Japan, which, though their existence had been long known, were for us practically discovered not more than forty years ago. And in the pathway of this light there came these revelations, which to the designers of those days must have been simply startling: that it was not then essential to good ornament to divide a circle into eight, sixteen, or thirty-two parts, in each of which the same amount of pattern was to be stencilly repeated; that it was not then essential to find the true centre of an object, and fixing a flower there to let all the stems radiate from it in ordered arrangement; that it was not then essential to make everything balance truly from that centre, of equal size, and at equal distances. In the work which came from Japan these and many other traditional rules which we deemed to be of the essence of art were cast to the winds, ignored in most insolent fashion: and yet the work was strangely delightful: had a grace of infinitely more charm than anything our traditions had ever produced for us: revealed a feeling of proportion and balance whose laws, it indeed there were any, were wrapped in deepest mystery. The effect of this on the Western workman was strange. Broad and pleasant paths of artistic wickedness seemed to open straight before him: to walk in them, he forsook the narrow path which his education bade him follow; he, too, would cast his traditions and his stencil-plates to the winds. And when he had so done his work became sprawly, his designs began to lack unity, he cultivated irregularity, and in proportion as he developed these peculiarities his execution deteriorated: a dabby, spotty eccentricity pervaded everything he did. The great art-spirit of the Japanese had been true to the first of artistic principles: she had concealed herself. Without any very great attempt to track her to her hiding-place we contented ourselves with a poor parody of her, and formulated a style which has no laws to guide it, and which for want of a better name I have christened *Japanesque*. I think I am not exaggerating when I describe the result as execrable; nor in saying that the revelation which came with the dawning light was startling am I using a mere rhetorical figure of speech. *The Times* of 1854 contains an account of one of if not the earliest exhibitions of Japanese things in London. A certain Dutch merchant, "wishing to ascertain whether the taste of the English nation was in accordance with the works of Japan," held an exhibition in Pall Mall in January of that year. *The Times* wondered "whether the same thing would happen to the Japanese as had already happened to the Hindoos, whose art work had been depreciated by the stupid conceit of the European, who must needs tie down their exuberant fancy to his own meagre or vulgar designs. . . . Such delicate and beautiful ornamentation had never been seen in the same perfection in this country. . . . Our papier maché manufacturers ought to feel themselves under special obligations to this Dutch merchant for enabling them to see how immeasurably the artisans of that barbarous island [as we thought it then] excel them." Thus *The Times*; and I have heard too how in this theatre, very nearly thirty years ago, the audience was so enraptured with a lecture delivered by Mr. Leighton on Japanese art, and with the objects he exhibited, that it was past midnight before this staid Institution could close its doors. I may at once attack one of the chief vices of *Japanesque*, which is an abortive attempt to grasp one of the leading characteristics of Japanese work; it is the fragmentary spray work with which our pots, and pans, and plates are nowadays ornamented, the angulate sprig of flower or fruit which comes from nowhere in particular and sprawls everywhere in general. Without putting you in darkness again let me picture to your mind's eye a very familiar dessert-service, the shape of dishes and plates unexceptional, the price a sum

unmentionable, the colour a greenish-grey, which is itself but a weak vibration of the pure celadon of the East. Thereon struggle various boughs and sprays of flowers coming, "*à la Japonaise*," from beyond the edge, with birds hovering about them. But the drawing of these birds is horridly impossible, and as to the proportion between them and the flowers, why, either they must have been snared in Lilliput, or the flowers culled in Brobdingnagian gardens. But even this is a small matter compared with the execution of them. The whole subject is first drawn in black outline, and the petals, stalks, and leaves simply dabbed or splashed with colour. This is not an unfair description of average *Japanesque* work. Now the points which the draughtsman fights for, on the supposed authority of Japanese art, are: visible irregularity of design coupled with haphazard composition; a suggestion of an invisible shrub growing somewhere, which has allowed one of its branches to trail across the plate; and a sort of conventional naturalism which serves as an excuse for hasty and poor workmanship. In this respect, indeed, his work does not approach even that of those palmy old days of British art when the potters painted just in the centre of a plate a posy of flowers as like to nature as they could make them. The Japanese work which this feeble stuff attempts to copy belongs essentially to the domain of pictorial art, and is governed by the same laws as the pictorial art of Japan. The greatest purist among decorators would never deny that pictorial art may very properly be applied to the purposes of decoration; but he would insist, and rightly, that when it is so applied it should conform to the principles of pictorial art, and must be judged by its standards. A base form of pictorial work, work without artistic vitality, is not to be tolerated merely because technical difficulties stand in the way of getting good execution on clay. If I paint a landscape on a potter's vessel I shall not be forgiven its crudity, its lack of depth and light; nor if it be a human face, its vacuity, simply because of the difficulties which my materials set in my way. Admittedly the work is much more difficult than if I painted my subject on paper or canvas; but art is power, and if it succeed, I may look for greater praise for my picture, because of the great technical difficulties which I have overcome; but the attempt to overcome them was of my own seeking, and if I fail, I cannot insist that, by reason of these technical difficulties, my art finds legitimate expression in a lower range of feeling. Nor, again, for art is long, can the length of time which work would occupy were it well done be an excuse for doing it badly. Is it essential to my happiness to cover my walls with red roses and ribbons, and my ceilings with chubby cupids and all the winged hierarchy of artistic space? I may do so, and infringe no real or imaginary law. But the cost, if it be the work of men's hands, or the difficulty of getting good results, if it be processed, will not be an answer to kind friends who tell me that my variegated patches of colour are hideous and mere nothingness, or that my cherubs are up aloft in positions of anatomic impossibility. Decorative art in its lowest form supplies the means of obviating those terrible productions in which our fathers of an age not so long past seem to have delighted. Let me turn your attention now for a moment to the pictorial art of Japan. Much of it depends for its charm on the simplicity of the means by which it produces its effects. It reveals in suggestion. The works of one of the greatest of its schools is in great part in monochrome. The treatment of leaves and flowers often approaches very closely to the conventional treatment necessary to ornament. In these simply black and white pictures much of the detail, even of the foreground, is left to the imagination; the middle distance is veiled in a misty cloud; the distance is suggested by a few delicate, almost disappearing, touches. Now the technical difficulties in the way of executing pictures such as these in materials less easy to manipulate than ordinary pigments are obviously much diminished. The canons of the art can be observed as faithfully by an artist working with lacquer and gold dust as by one who uses water and Chinese ink. The wood-carver and the metal worker, the embroiderer and the dyer, know that the masses of colour which their materials produce may be made to correspond entirely with the masses of full tone in a picture. Again, that wonderful dexterity of workmanship, which surpasses all we have even

dreamed of in the West, looks upon the hammer, the chisel, the needle, the knife, as no less facile instruments for producing sweeping swelling lines than the brush. And, yet again, whether they work with liquid pigment or stiff enamel, with threads of silk or with metal inlay, all craftsmen alike possess a complete mastery over the gradation of their tones, even to the vanishing point. And thus the art of all these craftsmen is identical both in spirit and in execution with the art of the painter; the result, monochrome pictures in shades of gold or steel, in platina of varied lustres, in dyes or in silk embroidery, which are as effective, and which are endowed with the same charms as the painted picture in black and white. Thus it comes about that the lacquer boxes, the porcelain, the silk or cotton raiment, and all the thousand things which add to the charm of life to the Japanese, are embellished with pictures, executed in precisely the same way, with the same firm lines and evenly-covered surfaces, with the same gradations of tone, the same dark shadows and fleecy clouds, as those which came from the studios of the Kano masters. I will ask you to look at my *Japanesque* plates once more. Mr. Lennox has very kindly turned them upside down; he evidently thought it made the boughs of the trees a little truer to nature, though the birds now fare rather badly. They are full of extraordinary angles, which, considered as a mere arrangement of lines, are bad enough, but looked at as an interpretation of nature are impossible. There is little of either Eastern or Western pictorial art about any of them; the one in which the spray comes on at three places might perhaps be taken as giving the idea of a plate hidden in a bush. The *Japanesque* designer delights to dwell on the fragmentariness of his design, insists on the existence of the remainder of the boughs; his designs are clumsily composed, and still more clumsily set upon the surface. These are among the chief characteristics of *Japanesque* which I will ask you to bear in mind. Now let me endeavour to explain to you how essentially this *Japanesque* work differs from the Japanese work upon which it is based. In point of mere execution it lacks two of its essential qualities, the smooth swelling surfaces which are produced by gradual pressure on the long pliant brush, and the strength and sweep of the lines. I will not dwell upon this point; but I think you will follow me at once when I say that the free lines which are drawn by a man kneeling, as the Japanese do, over his paper laid upon the floor, must be essentially different from the free lines drawn by a man facing his canvas, and working with a mahlstick, or sitting on a chair with his material on a table in front of him. The part of the body which forms the axis of the free lines is in each case different. The line drawn, for example, with the axis at the wrist must have a different character from that drawn with the axis at the shoulder. The methods of drawing in the East and the West have each produced characteristic results. I do not wish to compare them, only the quality of Japanese work is so intimately connected with the method of its execution, that it is impossible quite to catch the spirit of it unless we adopt the method, *pro hac vice* of course. But the drawing of most *Japanesque* work is execrable from a Western point of view. Western art does not sanction smudges as substitutes for rose-leaves; Western art requires some observance of proportion between the different objects of a picture; therefore in the most elementary essentials, *Japanesque* sins against both the East and West. That it cannot catch the trick of the Eastern line is, as I have said, not exactly the fault of the draughtsmen. They do not profess to copy Japanese models, but rather to adapt Japanese principles to their own work. And the first point, on which I would not have dwelt so long did it not pervade the whole subject, is that they have missed the pictorial quality of this form of Japanese decoration, and have parodied it with crude outlines and haphazard smudging. It is the failure to recognise the pictorial quality of this Japanese work that has led to the *Japanesque* arrangement of branches which makes them appear as if they came from somewhere else, and the insistence on the existence of the rest of the branch, both of which are entirely foreign to the Japanese idea. Now, in the first place, it must be clearly understood that the Japanese do both profess and practise a rigid adherence to the structural principle of ornament. Their art never allows

them so to ornament a surface as to make it appear part of something which is non-existent. Perhaps the corresponding principle in pictorial art may be stated concisely, thus: a picture should not look as if it were a slice cut out of a panorama, with more to follow at either end. Japanese pictorial art, in its very nature, delighting to paint one incident, not many, enables the principles of focus to be more carefully observed than they are in the West. Now the bough of plum or cherry tree, with its buds and blossoms, is one of the most familiar subjects in Japanese paintings, for a very sufficient reason; it is one of the most familiar objects in a Japanese house. In the floral pictures with which, week by week, they beautify their homes, the Japanese use everything that nature gives them, not the bud and flower alone, nor the twig and leaf alone, but the whole bough. Whole branches of flowering shrubs are set in their vases, and these branches reappear in their pictures. And I think the simple secret of their being set close to the edge of the paper or the plate, is that that is precisely how the branch is seen in the house, cut in a sharp line by the edge of the vase or hanging basket in which it is placed. Then, too, a sort of artificial focus is obtained by the pruning of twigs and flowers at the base of the branch. But of suggestion of the rest of the tree, the suggestion of which Japanese is so full, there is not the slightest trace. Such an idea as that a spray should come on to the plate in three different places would be quite impossible for a Japanese artist even to imagine. Far more important even than the points I have already touched upon is the composition of the design for picture or ornament. And it is in this, as I think you will have seen, that Japanese, with its astonishing angles, true neither to nature nor to art, so terribly misses the mark. It is in this that the Japanese so entirely excel. I cannot but digress to dwell for a short space upon the Japanese art of beautiful arrangement, out of which composition in design springs. You are all probably familiar with one of the commonest forms of Japanese ornament—that in which the surface is sprinkled with heraldic devices, or with fragments or patches of ornament; often, in the case of a continuous design, it is broken in upon here and there by imaginary, or slightly indicated, cloud-masses. The principle is the same in both cases. The devices or patches may be few, or many, but they are set upon the surface irregularly, with apparent haphazard, or, as the Japanese say, "jiggi-jiggi." The effect is invariably charming; in spite of the very small material used to produce it, there is a sense of completeness which is the more surprising as it seems to conflict with every principle known to our own symmetrical art. And yet there is nothing haphazard about it: it is the result of a most finished study, guided by a most refined taste—the taste which enters into the minutiae of everyday life in Japan; whether it be the coolie setting out minute maple trees on the slopes of a miniature Fujiyama, the maiden settling gewgaws in her raven tresses, your "boy" arranging flowers for your table, the journeyman painter daubing colour on the commonest fan, all alike know the mysterious secret, and act upon it. You cannot live a week in Japan without noticing that it is deeply rooted in the people's instincts. I verily believe that, with some inclinations of the head, and not a few soft interjunctory reflections, a Japanese could put a postage-stamp on an envelope artistically. I pray you to forgive the banality of this word "artistically," but I use it deliberately. When the Japanese are said to be "so artistic," the speaker usually refers to this skill of theirs in beautiful arrangement. And those æsthetic souls who pose as the high priests of something they call "high art," they, too, have their little fantasies of arrangement; they love to set things all askew, thinking thereby to redeem themselves from the curse of commonplace, which indeed they do; they are certainly dimly conscious of one fact—that it is possible not to be commonplace. Beyond this they do not go, deeming "all anyhow" to be the perfect rule of art. "Culture," with its inept *niaiseries*, its tawdry and *fade* conceits, struggles still in the primers of a science of which the Japanese have long ago formulated every rule, and daily practise the examples. If they put one little flower-vase on a table, or paste on a screen a dozen differently-shaped poetry papers, the result is always effective, always charming; in their subtle arrangements there is a most admired disorder,

they seem indeed "to snatch a grace beyond the reach of art." Though I travel somewhat "beyond the reach of art," let me indicate, in the lightest and most Japanese method of suggestion, how wrapped up are the subtleties of this charm with intellectual pleasure. The delight which we derive from following a graceful curve, or from contemplating a perfectly balanced arrangement, seems to grow as the proportion between the "x" and "y" of the curve's equation, or between the "x" and "1-x" of the rectilinear arrangement increases in subtlety. There appear to be three distinct degrees of this pleasure. The pleasure of knowledge first, as of the proportions of a circle, or of a vase in the centre of a table; but this is of a very low order, often, indeed, approaching contempt. The mind knows at once how that is done. Then there is the repose and satisfaction of not knowing and not wanting to know. But when this satisfaction gives place to curiosity and the desire to know, the trouble of finding out produces cerebral fidgets; there is the excitement of discovery, probably the annoyance that the discovery was not worth the trouble after all, and the general subversion of that repose which beauty engenders. Some such intellectual processes seem to be the origin of the effects we call commonplace, beautiful, eccentric. And so, coming back to my vase and my table, the Japanese know not the one, but the hundred and one, places where to set the vase, so that the conditions are satisfied of subtle proportion and avoidance of curious or eccentric effect. And here, let me add, is an example of the abundant latitude which is left to individual expression in spite of the cloud of rules in which tradition and convention have wrapped this and every other Japanese subject. Precisely the same principle pervades the composition of all Japanese pictures, though one form of it very often leads to large spaces of blank, or, as it is often called, wasted paper. If the paper were cut down it would be so much nicer, so much more suited to form one of the crowd of pictures which jostle one another on our walls. Well, but the Japanese consider, in setting out the scheme of the picture, its relation to the area it has to cover; the balance of lines or of masses may, for instance, possibly require one shaft of bamboo to be carried up isolated into an otherwise blank space. The blank or slightly tinted paper seems to me as sufficient for all the requirements of art, as the wilderness of black, red, or blue paint with which we cover similar spaces on our canvases, calling them "backgrounds" of wall, curtain, or sky. The ugly necessities of primed canvas compel us to cover it all over with pigment; the necessities of the rapidly absorbent paper, or prepared silk, which the Japanese use, precludes their doing so; thus each necessity has produced its own law. But it is not in the somewhat lavish use of blank spaces alone, but in every line of the drawing, that this art of balanced arrangement is discernible, making for wholeness and completeness and repose. It is the absence of this that makes Japanese work so sprawly, distorted, and abortive. And verily it is not to be wondered at; it is not on our bizarre porcelain alone that this same quality of composition is lacking, but (I speak this with very bated breath) all our art seems to lack it altogether. Time permits me to dwell only on one other feature of Japanese work which greatly grieves the souls of the elect. Of recent years panels of doors have been decorated with boughs of trees which begin in space, sprawl across one panel, are continued in imagination behind the joint, to reappear and wander on across the second panel. It violates our own canons of art, but it is supposed to derive authority from the Japanese; yet, like every other Japanese notion, it is entirely contrary to their idea. If a Japanese artist has to ornament two panels of a screen with a continuous picture, he lays them close together on the floor, and, treating them as one, proceeds to paint his picture. Afterwards the panels are separated and put into the frame of the screen. There is thus no notion of the design being continued behind the frame. You will find the same principle in any Japanese picture-book. The double-page illustrations are deliberately cut down the middle and printed on opposite pages. Double-page illustrations are a vexation of the spirit. We have four ways of dealing with them, stitching-in, folding-down, printing sideways, and mounting on a guard. I do not say that in this case the Japanese

way is the best, but at least it is not more ruthless than stitching-in or folding-down, and is certainly more convenient than printing sideways. I have, with your kind indulgence, abused Japanesque sufficiently for one evening. I will endeavour to sum up its misdeeds in a single sentence. It conceived the Japanese art of ornament to be merely the embodiment of eccentricity, and therefore to be judged by other standards than those with which we had long been familiar: it cultivated eccentricity in its turn, and substituted for simplicity of style and vigour of execution crude designs and coarseness of workmanship. I have talked more of Japanesque than of Japanese; but I must now carry out my threat of saying a few words of Japanese art, and of showing you a few more specimens of it chiefly drawn from the Shiba and Nikko temples. With the form of Japanese decorative art which I have chiefly discussed this evening, the floral spray-work, most people are, I think, familiar. But I do not think it is so generally known that the art of the country, eclectic as is everything in Japan, embraces as many different forms of expression as there are styles in current use in the West. It is an eclectic art, but nothing ever passed into the service of the Japanese but it received the impress of the national spirit. A graceful symbolism and an ultimate reference to nature pervade it in all its forms, whether in the more fanciful side which makes it the most delightful of home arts, or in the severely classical side which puts it in the front rank of arts suited to devotion. For the panels and doorways for the shrine to a departed hero the Buddhist emblems furnish a hundred different diapers, so that the walls and doors glitter and scatter the light in a thousand fanciful ways. For the friezes and the ceilings not a flower that blows, nor the leaf that withers, but is pressed into the service; the peony and the chrysanthemum bend their stalks into a classic scroll, or the plum blossoms floating down the stream suggest new lines of exquisite tracery. Here a few lines of conventional work, notwithstanding their recurrence at regular intervals, and their almost geometrical treatment, compose a design as restless in its beauty as the sea-waves which have suggested it; and there the oft-repeated scrollwork tells of the summer cloud from which it has borrowed its shape. Dull monotony is packed away along with moulds and stencil-plates, and in its place, imaginativeness, suggestion, devotional reminders, worship of nature, infinite variety everywhere. That the art-instinct in the East, and among Eastern nations in Japan the highest, is higher than in the West, none will deny. It is not indeed to be wondered at. In that beautiful country life passes under easier and more graceful conditions than with us; there the days are not marred by the ever-presence and worship of the machine which civilisation the king has set up; there the sway of fashion is unknown, only that changeless law, the joy perpetual in the things of beauty; there one learns how great a part in life art may play, rendering every incident of the day more interesting by beautifying its surroundings, making them, when they minister to the wants of the body, minister also to the lust of the eye. It is in great part the lack of this, when one comes back to be ground by the great machine, that causes that Japanostalgia, which all suffer who have once set foot in that land of flowers.

STABILITY OF WALLS ON SOILS.—II.

Massive Buildings alongside of Light Buildings.

WHEN a massive building is erected close up to an existing light building, if a straight slip joint is not made in the case of using a party-wall, the heavy building is sure to drag down and wreck the contiguous parts of the light building. Very ruinous cases of this kind have occurred. It is very needful that the unit loading of the contiguous foundation should be as little as possible, consistent with the nature of the foundation soil, to insure the least settlement of the new heavy building.

But the case is greatly aggravated when there is no party wall used by both buildings together. Each building has its own independent footings on one side only of the adjoining walls, as in Fig. 5. This is one of the most difficult structural problems that the architect has to deal with when he cannot get abutting support on the adjoining property, because he has the weight of

the heavy division boundary wall to support upon the leg of an L, constituting a static couple, as shown by the relative position of the opposite arrows to the left side of Fig. 5, whereby tilting of the footings, and, to more or less extent, of the wall, is difficult to prevent. The difference of the subsidences of the light and heavy buildings is indicated by the scaled arrows, and evidence of the wreckage of the light building on the left, from the dragging down by the heavy building, is apparent from the nature of the case.

When additions are made on top of an old party-wall to serve for new higher buildings, the foundations, if not originally designed for the addition, should be widened by underpinning at suitable intervals, or otherwise, so as to produce a uniform rate of loading of the foundations for all parts of the new building, which rate should not exceed that of the old foundations.

Towers, Tall Chimneys, &c.—When towers, tall chimneys, &c., are built close to light walls or buildings, or when light interior walls are connected with heavy exterior walls, if the footing bases of each are not nicely adjusted to produce the same unit-area pressure upon the soil, unequal settlements must take place in compressible soils. It is therefore always safer to build them independently in the first instance, and to connect them afterwards when all settlement has ceased.

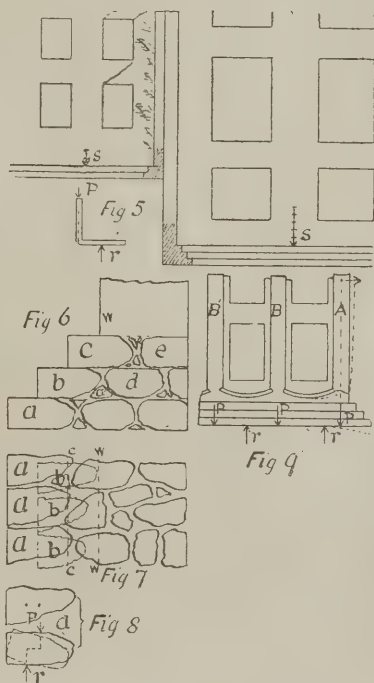
Extreme Cases of Undue and Unequal Overloading of Soil.—Only two such cases will be mentioned:—1. St. Martin's church, Trafalgar-square, the tower and spire of which overloaded the foundations, and subsided so disastrously as to drag down the facade, the centre of which it surmounts. The facade is all fissured and wrecked, and the tower also in a less degree. The lintels of the doors are more than 1 in. per foot out of level. Whether hoop-iron bond was inserted in the walls is not known to the writer, but such a provision would hardly have prevented the disaster that has happened. It is now contemplated to repair the wreckage, according to the specification and under the supervision of Sir Arthur W. Blomfield, A.R.A. 2. The next prominent case is that of the Great Yarmouth Town-hall (illustrated in the BUILDING NEWS, Sep. 27, 1878), the designs for which were chosen in public competition. The foundations were designed on the continuous principle of having footings underneath voids and solids alike. Very strong hoop-iron bond was lavishly employed throughout the external and internal walls; several tiers of hoop iron passing continuously through the masonry transoms between the horizontal tiers of voids. But notwithstanding such extra precautions, the entire building was wrecked externally and internally. The walls were fissured and out of plumb, and out of level from 8 in. to over 1 ft. at different points; the roof and gutters were also much wrecked and distorted. The wreckage was so wholesale that at first it was thought it would be necessary to pull it down and rebuild it. But in the meantime a plan of underpinning and restoration was submitted, and was successfully carried out, which was described in the BUILDING NEWS of Feb. 3, 1888, p. 174.

Lessons of Method of Restoration.—The study of the nature of the causes of such failures, and of the nature of the details of the method of restoration which have proved successful, afford the best form of practical lesson to the student of building construction. These details in regard to Great Yarmouth Town-hall, have been described at p. 174, BUILDING NEWS, Feb. 3, 1888. Too much importance cannot be attached to the fact in this, as in many other cases of failure of foundations, of the absence of due consideration of the practical bearing capacity of the underlying soil, and of the "law of subsidence," defined further on, and especially of the want of appreciation of the stratigraphical conditions of the site. In the present case there was no solid ground above the original sand and gravel beach of the pre-glacial estuary which lay submerged at a considerable depth (nearly 30 ft. at some points). The overlying soil being mainly accumulations of silt or ooze which had no solidity, being merely fine, soft, calcareous mud, derived from chalk formations, &c.

Rubble Footing Courses—Precautions.—In ordinary rubble-footing courses there is not sufficient attention given to the effectual bonding and overlapping of the preceding courses by those which follow as they are laid, nor to the disproportionate resistance of the truncations and the apex portions of triangular pieces, as they may be divided by the face of the footing course,

or of the wall, laid immediately upon it. Many defects arising under this heading may be attributable to the unshapeliness of the stones used for the purpose, many of which are left by the mason more or less triangular as quarried, for, besides being somewhat triangular, more or less elongated, or truncated, and irregular in form, they have their "beds" more or less "tailed off" as in Fig. 6, at *bcd* in the section of a footing. This "tailing off" may be either in the upper or lower "bed," or more or less on both these "beds." The vacuities in the walling thus occasioned are filled up with spawls, and chips, and with mortar. Now, referring to the plan of these footing courses, Fig. 7, *aa* are triangular blocks, such as the writer has seen laid, for masons are more particular to have the faces close-jointed than the backs of the course; *a'* is a back-filling or packing. The vacuities between are more or less solidly filled up with spawls, mortar, and debris of the work. The second or covering course is represented in dotted or fretted outline, *bbb*. The dotted line *cc* indicates the edge of the face of the next covering course *C*, Fig. 6, and similarly the dotted line *ww*, Fig. 7, indicates the position of the face of the wall, *W*, Fig. 6.

It will be observed that the area of the surface



of the bed-joint which projects outside of the edge of the covering course *bb* is much greater than the portion which is covered. The result is, that as the centre of gravity of a triangle which is its centre of reaction, is at one-third of its length as indicated at *r* in Fig. 8, and the centre of pressure of the covering course is at *P*, that a static couple is created, as indicated by the dotted opposite arrows, which tends to tilt the stone into the dotted position, whereby settlement and disturbance of the building is occasioned, from this source alone, independently of the disturbance which may result from yielding of the filling of mortar and spawls, underneath the tailings of the course stones of the footing. In all masonry the overlap of the covering course should exceed the half of the area of the lower course, to avoid any tendency to tilting up of its free end. When such tilting of the lower course of footings takes place its transverse section becomes curved, and upturned at the free edges so built.

Dangers of Inverted Arches in Foundations.—When building pilastered fenestrated buildings, or pier-panelled walls, upon compressible soils, it is often sought to give them more extended and equalised support by means of inverted arches laid immediately upon the footing, so as to prevent the piers from imposing undue unit pressure upon the underlying soil, by thus extending their bearing surface underneath the voids, which would otherwise have little direct pressure, in consequence of the yielding of the transom of masonry under the void. The

danger to be apprehended in such cases arises from the abutting outward thrust produced by the outside arch tending to become flattened, and (as in Fig. 9) to push outward and tilt the abutment or corner of wall at the springing of the arch, and thereby disturb the outer end or corner, as the case may be, of the foundation as shown dotted, which, however, indicates only the tilting tendencies, but not that of the pushing-out thrust, which is omitted to avoid confusion. But when the case is examined statically, according to the disposition of the points of the resultants of maximum pressure and reaction, there is an absence in the usual arrangement of such inverted-arch systems of a needful counterbalance of abutting stability between the points of maximum pressure and that arising at the central resultant of the reaction of the soil underneath the outer arch and the abutment foundation, tending to create a static couple at that point, and hence the tilting tendency. The flattening or spreading tendency of the outer arch could be avoided by introducing a tie-rod or band anchored to the inner piers, along the spring-line. The tilting out of the abutment, and also the canting of the footings could be made amenable to compensative static balance by a proper extension of the footings. It is usually recommended that inverted arches should not be flatter than the one-eighth part of a circle—i.e., equal to a rise of about one at the centre of the arch to five measured along its span-line or chord.

Soils are more or less Compressible.—All usual soils in building sites (except hard, solid rock), and including even compacted gravel and coarse, sharp, dry sand in natural deposits, and which are prevented from lateral flow by sheet piling revetments, &c., are in some degree compressible, and accordingly admit of corresponding subsidences with equivalent displacements of the imposed masonry. When structures are partly founded upon rock and partly upon gravel or other soils of dissimilar bearing power, more or less unequal subsidence occurs. Therefore, in the process of designing the foundation plan on the level of the footing base, an essential aim must be to keep the subsidence uniform throughout the extent of the building, and avoid unequal displacement of contiguous parts. When a soil is unequally loaded per unit area of its bearing surface on the foundation soil, there is an inequality of subsidence corresponding to the difference in the rate of unequal loading per unit area, according to the law of subsidence enunciated further on. The manner of unequal loading may be perpetrated in various forms and ways which are frequently lost sight of. These will appear as we proceed. The more compressible the soil the greater is the inequality of settlement. It is, therefore, advisable in dealing with the more compressible soils, such as clays, shales, loams, marls, silts, &c., to keep the rate of loading as low as possible consistent with economy and the objects and character of the building to insure the least permissible settlement taking place. It is an error to characterise, as is frequently done, gravel and sand as being equally incompressible with solid rock. Buildings and masonry structures which have been partly founded upon rock and partly on gravel have become fissured from the subsidence of the gravel.

The characteristics and conditions of stability or of mobility of foundation soils are so diversified and uncertain in the majority of their local forms that it is advisable the student of building construction should be aware that absolutely reliable practical application of much of the data which is available on the subject is only to be attained by intelligent appreciation of the subtle differences of composition to be met with even in different parts of the same building site. For instance, in the case of "clay," or the varieties of soil which ordinarily go by that name, their safe bearing power varies from $\frac{1}{2}$ ton up to 4 tons, and sometimes even to 6 tons, per square foot on a level plane, with a factor of safety ranging from 2 to 4. But when the tiro attempts to apply this data to any particular soil in question he finds himself at a loss if he cannot recognise the subtle qualities that it possesses, and which influence its bearing power as well as its permanent stability. True, he may drive, or have driven for him, a pick or crowbar, &c., into the "clay," which may perhaps resist such effort apparently as much as hard rock, and even give signs of not only hardness but likewise of toughness.

Dangers of Soil Transitions.—This same rock,

however, may upon a short exposure to the air or to damp be so much affected by absorption of their active principles as to be greatly softened and its stability so weakened that less pressure than one ton per square foot would cause sufficient displacement of a building to do a large amount of damage to the property. Some conditions of chalk make it also precarious as a foundation soil. Many such beds of shales and shaley clays are to be met with in the lias formation. The solvent properties of water and moisture on many soils, including the London clay, is very remarkable, no less than that of air, and the possible avenues of access of these to soils under foundations requires large experience to detect and to deal with effectually. The "pot-grown" of miners, which is the feldspar and potash of decomposed granite, and also pyrites affect the permanence of stability of soils in which they may be mixed when exposed to the air, so that they expand greatly in bulk, even when apparently quite dry, and therefore lose density. Moisture and water and air not only soften clays, shales, and clayey soils, but put them in a condition to be readily acted on by frost which follows the moisture deep into the mass, and causes expansion and softening, and consequent disturbance of foundations. Warm weather dries out soils so that they become fissured, which in turn form avenues for the permeation of moisture with its softening influence. The interior heat of a house, or of a workshop, factory, &c., may cause drying of a foundation soil if not protected by a layer of concrete, asphalt, &c.

The expansion of clays and shales, whether effected by air or moisture, appears to be of about equal extent, and is all powerful, as it will cause the displacement of the most ponderous buildings, and crushes the heaviest timbers put in excavations for shoring and strutting the banks.

(To be continued.)

BUILDERS' BENEVOLENT INSTITUTION. ANNUAL MEETING.

THE forty-fifth annual meeting of this Institution took place on Thursday, July 21, at the offices, No. 35, Southampton-row, Bloomsbury-square, W.C. Mr. B. E. Nightingale (president) occupied the chair, and amongst those present were Messrs. Thomas Stirling, E. Ryder, C. Ansell, and other friends of the charity.

Major Britton (secretary) read the report, which stated that an advance in some degree in the income of the Institution would be likely to justify the committee in advising that no eligible candidate need of necessity be excluded even for a time from participating in the anxiously sought for comforts which the charity bestows upon its recipients. It was satisfactory to observe that, amongst 55 pensioners, only two deaths had occurred during the past year, while three others had been elected. In accordance with the will of the late Mr. R. A. Newbon, of Islington, the Institution was entitled to a legacy of £1,000, less duty. This had to be invested in the stock belonging to the Institution in the Bank of England, agreeably to Rule 12, which applied to legacies. The sincere thanks of the committee were rendered to the president, Mr. B. E. Nightingale, for his energetic and effective appeal for the necessary means to meet the expenditure of the year, for his own liberality, and for the earnest and attentive interest taken by him in the prosperity of the Institution. The committee had pleasure in announcing that Mr. Joseph Randall (of the firm of Kirk and Randall) had accepted the presidency for the year, and would preside at the annual dinner in the hall of the Worshipful Company of Carpenters, when it was hoped to be a large and successful gathering.

Mr. Thomas Stirling moved the adoption of the report, which was seconded by Mr. E. Ryder, and unanimously agreed to.

Cordial votes of thanks were passed to the president, vice-presidents, trustees, treasurer, committee, and auditors.

The chairman then proposed that Mr. Joseph Randall be the president for the ensuing year. Mr. Stirling seconded the motion, which was cordially received.

A vote of thanks was passed to the chairman for presiding, and a similar compliment was paid to Major Britton in recognition of his exertions on behalf of the charity. The proceedings then terminated.

PRICES.*—XLI.

(All Prices Include Profit.)

IRONMONGER (continued).

PATENT LOCKS (continued).—CHUBB'S.

TWO BOLT RIM LOCKS, fixed—

5in. with handle and keyhole on both sides, for room or shop doors	each	£	s.	d.
6 ditto and ditto	ditto	1	16	0
7 ditto and ditto	ditto	1	19	0
8 ditto and ditto	ditto	2	2	0
5in. ditto and ditto made entirely of brass	ditto	2	6	0
6 ditto and ditto	ditto	2	8	0
7 ditto and ditto	ditto	2	15	0

RIM DEAD LOCKS, fixed—

4in. to lock on one side only, for room doors	ditto	1	2	0
4 ditto to lock on both sides	ditto	1	5	0
5 ditto	ditto	1	3	0
5 ditto to lock on both sides	ditto	1	6	0
6 ditto	ditto	1	4	0
6 ditto to lock on both sides	ditto	1	7	0
7 ditto to lock one side, for ware-houses, shops, &c.	ditto	1	6	0
7 ditto to lock on both sides	ditto	1	9	0
8 ditto for ditto	ditto	1	11	0
8 ditto to lock on both sides	ditto	1	14	0
9 ditto for ditto	ditto	1	16	0
9 ditto to lock on both sides	ditto	1	19	0
10 ditto for ditto	ditto	2	6	0
10 ditto to lock on both sides	ditto	2	10	0
4 ditto brass to lock on one side only	ditto	1	7	0
4 ditto ditto to lock on both sides	ditto	1	11	0
5 ditto ditto	ditto	1	10	0
5 ditto ditto ditto	ditto	1	14	0
6 ditto ditto	ditto	1	14	0
6 ditto ditto ditto	ditto	1	17	0
7 ditto ditto	ditto	2	0	0
7 ditto ditto ditto	ditto	2	3	0
8 ditto ditto	ditto	2	11	0
8 ditto ditto ditto	ditto	2	13	0
Brass bolts for damp cellars to 4in or 5in.	ditto	0	2	0
Ditto 6in. or 7in. extra	ditto	0	3	0
Ditto 8in. or 9in. extra	ditto	0	4	0

SPRING RIM LOCK for street doors—

4in. with keyhole on both sides, and knob on the inside only	ditto	1	14	0
5 ditto and ditto	ditto	1	16	0
6 ditto and ditto	ditto	1	19	0
7 ditto and ditto	ditto	2	2	0
8 ditto and ditto	ditto	2	6	0

NEW CHEAP HOUSE LOCKS, fixed—

SEGMENT BOLT LOCKS, with hinged latch bolts, silent and frictionless, adjustable striking-plate or staple. Brass bolts and levers to all locks. Brass cases to all mortise locks—

4in. 2-lever, 1 key rim, with adjustable striking plate	each	0	7	6
5 ditto ditto ditto	ditto	0	8	0
6 ditto ditto ditto	ditto	0	9	0
7 ditto ditto ditto	ditto	0	10	6
4in. 4-lever and 1 key ditto	ditto	0	8	6
5 ditto ditto ditto	ditto	0	9	0
6 ditto ditto ditto	ditto	0	10	0
7 ditto ditto ditto	ditto	0	11	6
4in. 2-bolt mortise, with adjustable striking-plate, 2 levers, and 1 key	ditto	0	8	6
5 ditto ditto and ditto	ditto	0	9	0
6 ditto ditto and ditto	ditto	0	10	0
7 ditto ditto and ditto	ditto	0	11	6
4in. 2-bolt 4-lever, and 1 key	ditto	0	9	6
5 ditto ditto	ditto	0	10	0
6 ditto ditto	ditto	0	11	0
7 ditto ditto	ditto	0	12	6

SEGMENT BOLT LATCHES, fixed—

4in. rim night latch, one sided, with adjustable striking plate, 4 levers and 2 keys	ditto	0	11	6
5 ditto ditto and ditto	ditto	0	12	0
6 ditto ditto and ditto	ditto	0	13	0
7 ditto ditto and ditto	ditto	0	14	0
4in. mortise latch action only, with adjustable striking-plate, no key	ditto	0	5	6
5 ditto ditto ditto	ditto	0	6	0
6 ditto ditto ditto	ditto	0	6	6
7 ditto ditto ditto	ditto	0	7	6

DEAD LOCKS, fixed—

One-sided locks admit key from inside only, two-sided from both sides				
4in. rim, dead one side, with ordinary striking staple, 2 levers and 1 key	each	0	5	6
4 ditto 4 levers ditto	ditto	0	6	6
4 ditto two-sided and 2 levers and one key	ditto	0	7	6
4 ditto ditto and 4 levers and 1 key	ditto	0	8	6
5in. one sided ditto and 2 levers and 1 key	ditto	0	6	0
5 ditto 4 levers and 1 key	ditto	0	7	0
5 ditto two-sided, 2 levers and 1 key	ditto	0	8	0
5 ditto ditto and 4 levers	ditto	0	9	0
6 ditto one-sided 2 levers	ditto	0	6	0
6 ditto ditto and 4 levers	ditto	0	7	6
6 ditto two-sided 2 levers	ditto	0	8	6
6 ditto ditto and 4 levers	ditto	0	9	6
4in. mortise dead, with ordinary striking staple 2 levers and 1 key	ditto	0	7	0
4 ditto 4 levers	ditto	0	8	0
5 ditto 2 levers	ditto	0	7	6
5 ditto 4 levers	ditto	0	8	6
6 ditto 2 levers	ditto	0	8	0
6 ditto 4 levers	ditto	0	9	0
7 ditto 2 levers	ditto	0	9	0
7 ditto 4 levers	ditto	0	10	0
All brass mortise locks, 20 per cent. extra.				
Ditto rim locks, 50 per cent. extra.				

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Half rebated mortise locks, $\frac{1}{2}$ rebate extra	each	£	s.	d.
Full ditto ditto ditto	ditto	0	2	6
Reverse bolt rim latches	ditto	0	1	0
Reverse two bolt rim locks	ditto	0	1	0
Additional keys for locks or latches	ditto	0	1	0
Suited locks with one key each to differ, extra	ditto	0	1	6
Master or sub-master key, to pass same	ditto	0	2	6
Patent Automatic door catch, unfixed—				
1 $\frac{1}{2}$ in.	ditto	0	1	2
2in.	ditto	0	1	4
2 $\frac{1}{2}$ in.	ditto	0	1	8
3in.	ditto	0	2	3
Brass knob, with rose for ditto	ditto	0	0	9
Larger ditto ditto	each	1s.	to	0 1 3

BEST QUALITY ROOM LOCKS, fixed—

4in. mortise lock, with reversible latch bolt to suit either hand, best brass furniture, and self-adjusting spindle, for any thickness of door	each	1	17	0
Ditto made entirely of brass	ditto	2	6	0
5in. ditto, as first	ditto	2	2	0
Ditto all brass	ditto	2	10	0
6in. ditto, as first	ditto	2	4	0
Ditto all brass	ditto	2	12	0
7in. ditto, as first	ditto	2	7	0
Ditto all brass	ditto	2	17	0

SPRING MORTISE LOCKS, fixed—

3 $\frac{1}{2}$ in. or 4in. for shop, house, or room doors	ditto	1	17	0
5in. ditto ditto ditto	ditto	2	2	0
6in. ditto ditto ditto	ditto	2	4	0

MORTISE DEAD LOCKS, fixed—

2 $\frac{1}{2}$ in. for warehouses, storerooms, &c., or as extra locks on inner doors	ditto	1	5	0
Ditto, made entirely of brass	ditto	1	8	0
3in. ditto, as first	ditto	1	5	0
Ditto made entirely of brass	ditto	1	9	0
3 $\frac{1}{2}$ in. ditto, as first	ditto	1	6	0
Ditto made entirely of brass	ditto	1	10	0
4in. ditto, as first	ditto	1	7	0
Ditto made entirely of brass	ditto	1	12	0
5in. ditto, as first	ditto	1	8	0
Ditto made entirely of brass	ditto	1	14	0
6in. ditto, as first	ditto	1	9	0
Ditto made entirely of brass	ditto	1	16	0

STREET-DOOR LATCHES, fixed—

4in. combination latches for street doors, opening inwardly	ditto	0	15	6
4 $\frac{1}{2}$ in. ditto ditto	ditto	0	16	6
5 ditto ditto	ditto	0	16	6
Extra keys	ditto	0	2	0
Two keys with lock	ditto	0	3	6
Keys made after	ditto	0	6	6
2 $\frac{1}{2}$ in. mortise latch for street doors, with very small key	ditto	1	6	6
3 ditto ditto ditto	ditto	1	7	6
3 $\frac{1}{2}$ ditto ditto ditto	ditto	1	8	6
4 ditto ditto ditto	ditto	1	9	6
Extra keys the same as above				
3in. flush latch for street doors	ditto	1	2	6
3 $\frac{1}{2}$ ditto ditto	ditto	1	3	6
4 ditto ditto	ditto	1	4	6
4 $\frac{1}{2}$ ditto ditto	ditto	1	5	6
5 ditto ditto	ditto	1	6	6
Extra keys same price as last.				
Flush spring lock, to lock also by an extra turn of the key, made only to order, extra	ditto	0	10	0
4in. rim latch for street doors	ditto	1	4	6
4 $\frac{1}{2}$ ditto ditto	ditto	1	5	6
5 ditto ditto	ditto	1	6	6
Extra keys same price as last.				

BOX OR CHEST LOCKS, fixed—

1 $\frac{1}{2}$ in. or 2in. brass	ditto	0	12	0
2 $\frac{1}{2}$ ditto	ditto	0	12	6
3 ditto	ditto	0	13	6
3 $\frac{1}{2}$ ditto	ditto	0	14	0
4 ditto	ditto	0	15	6
Box lock to shut with spring, extra	ditto	0	3	0

WARDROBE LOCK, fixed—

4 $\frac{1}{2}$ in. by 2 $\frac{1}{2}$ in. combining a spring latch with a cut cupboard lock	ditto	1	3	0
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LINK PLATE WARDROBE LOCK, fixed,

ordinary size	ditto	1	5	0
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ESCUTCHEON LOCK, fixed—

Used as an additional check lock for fixing over keyholes of safes, iron doors, &c.	ditto	1	7	6
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CUPBOARD LOCKS, fixed—

2in. brass, cut or straight	ditto	0	10	9
2 $\frac{1}{2}$ ditto ditto	ditto	0	11	3
3 or 3 $\frac{1}{2}$ in. ditto	ditto	0	11	9
4 by 2in. ditto	ditto	0	12	9

LINK PLATE CUPBOARD LOCKS, fixed—

2 $\frac{1}{2}$ in. brass	ditto	0	12	6
3 ditto	ditto	0	13	6
3 $\frac{1}{2}$ ditto	ditto	0	14	0

PEDESTAL LOCKS, fixed—

2 $\frac{1}{2}$ in. brass for sideboards	each	0	12	6
3 ditto ditto	ditto	0	13	6
3 $\frac{1}{2}$ ditto ditto	ditto	0	14	6

DRAWER LOCKS, fixed—

1 $\frac{1}{2}$ in. brass cut	ditto	0	10	9
2 ditto	ditto	0	11	6
2 $\frac{1}{2}$ and 3 $\frac{1}{2}$ ditto	ditto	0	12	0
3 ditto	ditto	0	12	9
3 $\frac{1}{2}$ by 3 ditto	ditto	0	14	9
Drawer locks, to shut with spring	ditto	0	8	9

PADLOCKS—		£ s. d.
1/2 in. made entirely of brass, excepting	each	0 12 6
1 1/2 ditto	ditto	0 11 0
1 1/2 ditto	ditto	0 12 0
1 1/2 ditto	ditto	0 12 6
2 ditto	ditto	0 14 6
Ditto ditto if with brass hasp	ditto	0 15 0
2 1/2 in. ditto	ditto	0 16 6
Ditto ditto with brass hasp	ditto	0 17 6
3 in. ditto	ditto	0 17 6
Ditto ditto ditto	ditto	0 19 0
3 1/2 in. ditto	ditto	1 1 0
Ditto ditto ditto	ditto	1 3 0
4 in. ditto extra strong	ditto	1 10 0

NEW PATENT PANIC door lock and apparatus for an ordinary door not exceeding 6 ft. 6 in. by 2 ft. 9 in., or less than 1 1/2 in. thick, unfixed ditto 3 5 0
For a pair of similar folding doors, each not exceeding 6 ft. 6 in. to 2 ft. 9 in., and not less than 1 1/2 in. thick ditto 4 15 0
(For wider doors an extra charge is made of 2s. The apparatus is supplied proportionately larger for these.)

DOOR FURNITURE, fixed—		£ s. d.
No. 11 2 1/2 in. brass, plain pattern	per set	0 2 9
725 ditto Adelaide	ditto	0 3 9
525 ditto Victoria	ditto	0 4 9
609 ditto Empire	ditto	0 6 9
676 ditto Princess	ditto	0 6 9
729 ditto Sydney	ditto	0 6 9
721 ditto Melbourne	ditto	0 7 9
207 ditto Royal Courts	ditto	0 9 3
347 ditto Queen Anne	ditto	0 10 3
682 ditto Cranleigh	ditto	0 10 3
708 ditto Beaulieu	ditto	0 14 3
17 ditto stamped 1 1/2 in.	ditto	0 1 9
24 ditto ditto Queen Anne	ditto	0 2 3
Circular escutcheons	a pair	0 0 7
Ditto ditto large	ditto	0 0 11
Ditto ditto drop	ditto	0 1 8
No. 11 2 1/2 in. brass	per set	0 3 3
643 ditto	ditto	0 3 0
351 ditto	ditto	0 13 3
707 ditto	ditto	1 0 3
606 ditto	ditto	0 8 0
211 ditto	ditto	0 11 9
563 ditto	ditto	0 13 3

2 1/2 in. OAK, fixed—		£ s. d.
No. 61 plain pattern	ditto	0 3 9
538 Victoria ditto	ditto	0 6 3
639 Empire ditto	ditto	0 6 3
680 Princess ditto	ditto	0 6 9
227 Royal Courts ditto	ditto	0 5 9
367 Queen Anne ditto	ditto	0 7 6
565 ditto ditto	ditto	0 7 6
Circular escutcheons	per pair	0 10 0
Large ditto	ditto	0 1 1
Drop ditto	ditto	0 1 8

2 in. OAK—		£ s. d.
No. 65 plain pattern	per set	0 4 9
539 Victoria ditto	ditto	0 7 6
617 Empire ditto	ditto	0 7 6
633 Princess ditto	ditto	0 7 9
231 Royal Courts ditto	ditto	0 7 0
371 Queen Anne ditto	ditto	0 8 9
586 Cranleigh ditto	ditto	0 8 6

2 1/2 in. EBONY—		£ s. d.
No. 111 plain pattern	ditto	0 4 3
557 Victoria ditto	ditto	0 6 9
615 Empire ditto	ditto	0 6 9
673 Princess ditto	ditto	0 7 6
267 Royal Court ditto	ditto	0 6 3
407 Queen Anne ditto	ditto	0 8 0
597 Cranleigh ditto	ditto	0 7 9
Circular escutcheons	a pair	0 0 11
Large ditto	ditto	0 1 2
Drop ditto	ditto	0 1 8

2 1/2 in. EBONY—		£ s. d.
No. 115 plain pattern	per set	0 5 3
535 Victoria ditto	ditto	0 7 9
637 Empire ditto	ditto	0 7 9
656 Princess ditto	ditto	0 8 6
271 Royal Courts ditto	ditto	0 8 0
411 Queen Anne ditto	ditto	0 9 9
575 Cranleigh ditto	ditto	0 9 3

FINGER PLATES, fixed—		£ s. d.
No. 1023 in brass, with square or round ends	per pair	0 6 3

No. 1051..... per pair		s. d.	No. 1041 per pair		s. d.
1038	ditto	9 6	1044	ditto	10 0
1074	ditto	9 6	1073	ditto	9 6
1011	ditto	9 0	1004	ditto	12 0
1035	ditto	12 3	1053	ditto	18 3
1050	ditto	5 0			
1020 oak	ditto	4 3	1040	ditto	7 2
1037	ditto	8 11	1043	ditto	7 6
1012	ditto	7 9	1002	ditto	10 0
1034	ditto	9 11			
1026 ebony	ditto	4 2	1059	ditto	7 9
1042	ditto	7 9	1045	ditto	8 6
1010	ditto	7 9	1001	ditto	10 6
1036	ditto	10 0			

PATENT PADLOCK BARS—		£ s. d.
3 in. or 12 in. long, fixed to wood	each	0 8 6
Ditto ditto iron	ditto	0 10 6

HOBBS' LOCKS, fixed—		£ s. d.
1 and 2-bolt HORIZONTAL RIM LOCKS—		
No. 9 C 6 in. 1-bolt 2-lever 1 1/2 knobs	each	0 5 0
13 C 6 2 4 2	ditto	0 8 6
15 C 7 2 4 2 1/2	ditto	0 10 6
17 C 8 2 4 2 1/2	ditto	0 13 0

DOUBLE EXTRA STRONG, for massive doors, and 2 keys each, fixed—		£ s. d.
No. 18 C 6 in. 2-bolt 5-lever 2 1/2 knobs	ditto	1 5 0
19 C 10 2 5 2 1/2	ditto	1 10 0

Fine-finished locks are 1s. extra.

2-BOLT RIM, best quality, 2 keys, fixed—		£ s. d.
No. 1 C 6 in. 2-bolt 2 1/2 knobs	each	1 13 0
2 C 7 2 2 1/2	ditto	1 18 0
3 C 8 2 2 1/2	ditto	2 4 0
4 C 9 2 2 1/2	ditto	2 10 0
5 C 10 2 2 1/2	ditto	2 16 0
6 C 12 2 2 1/2	ditto	3 12 0

DEAD LOCKS: Lever rim, 2-sided, 2 keys, fixed—		£ s. d.
No. 10 D 3 in. 3-lever, for doors 1 1/2 in. thick	each	0 7 0
11 D 3 1/2 3 ditto	ditto	0 7 6
12 D 4 4 ditto	ditto	0 9 0
13 D 6 4 ditto	ditto	0 9 6
14 D 7 4 ditto	ditto	0 10 6
15 D 8 4 ditto	ditto	0 14 0
16 D 9 4 ditto	ditto	0 17 6

Ditto, best quality, 2 keys, fixed—		£ s. d.
No. 1 D 4 in. extra strong	ditto	1 2 6
2 D 5 ditto	ditto	1 3 6
3 D 6 ditto	ditto	1 5 6
4 D 7 ditto	ditto	1 8 0
5 D 8 ditto	ditto	1 11 0
6 D 9 ditto	ditto	1 15 6
7 D 10 ditto	ditto	2 5 0

Ditto, lever rim, 1-sided, 2 keys, fixed—		£ s. d.
No. 10 E 4 in. 5-lever, extra strong	ditto	0 12 0
11 E 5 5 ditto	ditto	0 13 6
12 E 6 5 ditto	ditto	0 14 6
13 E 7 5 ditto	ditto	0 16 6
14 E 8 5 ditto	ditto	0 19 6
15 E 9 5 ditto	ditto	1 2 0
16 E 10 5 ditto	ditto	1 6 6

Fine-finished 1s. each extra.		£ s. d.
Ditto, ditto, best quality—		
No. 1 E 4 in. extra strong	ditto	1 2 0
2 E 5 ditto	ditto	1 3 0
3 E 6 ditto	ditto	1 3 6
4 E 7 ditto	ditto	1 5 6
5 E 8 ditto	ditto	1 9 0
6 E 9 ditto	ditto	1 12 6
7 E 10 ditto	ditto	2 2 0

DRAW-BACK LOOKING LATCHES, 2-sided, fixed, to open and double-lock inside and outside with the key, and bolt to draw back on the inside—		£ s. d.
No. 31 F 4 lever latches for doors 2 in. thick	ditto	0 10 9
32 F 6 ditto	ditto	0 13 0
33 F 7 ditto	ditto	0 18 0
34 F 8 (light) ditto	ditto	1 1 0

Extra keys 1s. each, or if made to order 2s. each.

Fine-finished 1s. extra, 2 keys.		£ s. d.
DRAWBACK LOOKING LATCHES, extra strong, for heavy doors, 2 keys, and fixed—		
No. 40 F 8 by 1 1/2 for doors 2 1/2 thick	ditto	1 3 0
42 F 9 by 1 1/2 ditto 2 1/2 thick	ditto	1 5 0
44 F 10 by 1 1/2 ditto 2 1/2 thick	ditto	1 9 0

With brass Gothic mountings extra 4s. to 10s. each.		£ s. d.
MORTISE LOCKS, lever, 1-bolt, 1 key, fixed—		
No. 3 a 6 by 1 in. 1-bolt 2-lever strong	ditto	0 6 6
4 a ditto ditto 3 ditto	ditto	0 7 6
5 a ditto ditto 2 narrow	ditto	0 7 6
15 a ditto ditto 3 ditto	ditto	0 8 6
6 a 6 by 1 1/2 ditto 4 ditto	ditto	0 10 0

Extra charge with American rotary bolt, 1s. 6d. each.		£ s. d.
Ditto, 2-bolt, fixed—		
No. 6 a 6 by 1 in. 3 levers, 1 key	ditto	0 9 6
8 a 6 by 1 1/2 4 ditto	ditto	0 9 6
10 a 6 by 1 1/2 4 ditto	ditto	0 11 0
12 a 6 by 1 1/2 4 ditto	ditto	0 15 0
14 a 6 by 1 1/2 5 ditto	ditto	0 14 0
16 a 6 by 1 1/2 5 ditto	ditto	0 16 0
18 a 6 by 1 1/2 5 ditto	ditto	1 2 0
20 a 6 by 1 1/2 5 ditto	ditto	1 6 6

Fine-finished 1s. extra.		£ s. d.
Ditto, 2-bolt, best quality, fixed—		
No. 19 a 6 by 1 in. 2-bolt	ditto	2 2 0
20 a 6 by 1 1/2 ditto	ditto	2 3 0
21 a 6 by 1 1/2 ditto	ditto	2 5 0
22 a 6 by 1 1/2 ditto	ditto	2 5 0
23 a 6 by 1 1/2 ditto	ditto	2 8 0
24 a 6 by 1 1/2 ditto	ditto	2 15 0
25 a 6 by 1 1/2 ditto	ditto	3 0 0

If with 8 bolts add 2s. to 5s. each extra.		£ s. d.
UPRIGHT MORTISE LOCKS, 2-sided, fixed—		
No. 32 a 1 1/2 by 1 in. 1 bolt, 3-lever, extra strong	ditto	0 17 0
33 a 2 by 1 1/2 ditto	ditto	0 15 0
34 a 2 1/2 by 1 1/2 ditto	ditto	0 13 6
35 a 3 by 1 1/2 ditto	ditto	0 9 0
36 a 3 by 1 1/2 ditto	ditto	0 11 6
37 a 4 by 1 1/2 ditto	ditto	0 9 6
38 a 4 by 1 1/2 ditto	ditto	0 11 6

Fine-finished 1s. 6d. extra, 1 key each.		£ s. d.
Ditto, best quality, 2 keys each fixed—		
No. 40 a 3 by 1 1/2 2-bolt, upright	ditto	1 10 0
41 a 3 by 1 1/2 ditto	ditto	1 14 0
42 a 4 by 1 1/2 ditto	ditto	1 10 0
143 a 4 by 1 1/2 ditto	ditto	1 16 0
144 a 4 by 1 1/2 ditto	ditto	2 0 0
46 a 5 by 1 1/2 ditto	ditto	2 5 0
48 a 5 by 1 1/2 ditto	ditto	2 8 0

MORTISE DEAD LOCKS, 2-sided, fixed—		£ s. d.
No. 21 B 3-lever, strong, 2 keys	ditto	0 14 0
22 B ditto ditto	ditto	0 13 0
23 B ditto ditto	ditto	0 12 0
24 B ditto ditto	ditto	0 8 6
25 B ditto ditto	ditto	0 9 0
26 B 4-lever ditto	ditto	1 0 6
27 B ditto ditto	ditto	1 11 0
127 B 5-lever, extra strong	ditto	0 12 6
128 B ditto ditto	ditto	0 15 0
130 B ditto ditto	ditto	1 0 0

Ditto, best quality—		£ s. d.
No. 32 B 2 1/2 by 1 in. 2 keys	ditto	1 1 0
33 B 3 by 1 1/2 ditto	ditto	1 2 6
34 B 3 1/2 by 1 1/2 ditto	ditto	1 3 6
35 B 4 by 1 1/2 ditto	ditto	1 4 9
36 B 4 1/2 by 1 1/2 ditto	ditto	1 7 9
38 B 6 by 1 1/2 ditto	ditto	1 11 0
40 B 7 by 1 1/2 ditto	ditto	1 11 0
41 B 7 by 1 1/2 ditto	ditto	1 16 0
42 B 4 by 1 1/2 ditto	ditto	2 1 0
43 B 7 by 1 1/2 ditto	ditto	2 1 6

AN ARCHITECTURAL TOUR IN 1634.

(Concluded from page 68.)

WE left our three travellers at Chester. It was near the end of August when they arrived there, having passed in little more than a fortnight through Lincoln, York, Durham, Newcastle, and Carlisle, on their way from Norwich. Though two centuries and a half have rolled on since their diary was written, the notable buildings they saw are those which the tourist still chiefly wishes to see. They saw them to more advantage than we can. The Late Gothic work of the cathedrals was comparatively new. The last of it had been built within two or three generations, and was no more of an antiquity to them than Somerset House, for instance, is to us. Time could have marked it but little. Religious destructiveness had only done part of its work, for the Puritan surveys of Cromwell's time were yet to come. Churchwardenism, with its whitewashings and beautifyings, was in the distant future, and radical restoration was still undreamt of. It is interesting, therefore, to note the impression which our great national monuments made on men who saw them under such favourable conditions. But it is somewhat humiliating to think how few fine buildings of the first rank England has gained since the time of Charles I. And it is remarkable that those which have been added are rarely in the old towns and cities. Most frequently they are in modern places like Manchester and Birmingham—towns whose first small beginnings may have been ancient, but whose development was slow, and whose importance is a thing of recent times.

Chester Cathedral, even in 1634, proved to be disappointing. It is dismissed as being an old building of white stone, with no ancient tombs of any interest or value. The interest of Chester, then as now, lay elsewhere. The "rows," where "you may walk dry in any wet weather on a gallery by all the shops," were, as they still are, the most characteristic feature of the place. The houses struck our tourists as indifferent. Half-timbered work, no doubt, was familiar to them, and familiarity had produced contempt. Moreover, the half-timbered buildings at Chester are not, taking them altogether, of the very best type. They are far less satisfactory than those at Shrewsbury, and, if the truth may be told, one does grow rather weary of their multiplicity. A wooden house here and there is very well; but whole streets of wooden houses are too much for most of us. St. Mary's, Chester, proved more satisfactory than the cathedral. There, in "Tropie's Chappell," was a curious monument of alabaster, to Lord Tropie and his lady, a princess; and another to his son, whose wife was daughter to the Earl of Shrewsbury. On Christmas Eve, the mayor, sheriffs, aldermen, and common councillors had a custom of going about the city in triumph, with torches and fireworks. The recorder then made a speech on the antiquity of the place, and told how it was founded by giants. On Midsummer Eve the giants and some wild beasts kept for the purpose were taken round in another procession. The days of Queen Elizabeth and her two next successors must have been the golden age of giants. We read of them everywhere, and no pageant seems to have been thought complete without them.

At Stafford, mention is made of a fair Shire Hall, all built with freestone, very high and stately. On each side of it were six open arches, with great pillars. It was all paved with stone, and was the chief fabric and pride of the town—"if it were but handsomely and cleanly kept." The large church was not at all adorned. After crossing the Trent at Onseley, the travellers came in view of a most stately, gorgeous house, built castle-like (Lord Paget's). Its gardens and walks, made to grace that sumptuous building, cost a great sum of money. Next appeared "those stately high spires of Lichfield Cathedral, standing as the city doth in a sweet and pleasant site, where the rich meads and fertile fields environ her on every side." The Medieval love of plains, and horror at mountains and rocks, had not quite died out yet. Many fair and ancient monuments remained in the cathedral, including Bishop Langton's, Bishop Hayes', and Bishop Butler's; also Lord Basset's, of Drayton Basset, in his coat of mail and armour of proof, with the wild boar at his head and feet; Lord Paget's, with his son and his lady, "with the tiger at the top, and eight fair marble pillars." In the Lady

chapel there were eight stately painted windows; and on the west front, above 100 fair statues of Kings, Patriarchs, Prophets, Fathers, and Apostles. In time past, it was reported, these had all been gilt. The interior of the choir had still six gilt statues, three on each side. These probably, like Marmion's supposed tomb there,

"Were levelled when fanatic Brook
The fair cathedral stormed and took":

and though much has since been done in the way of repair and re-adornment, we can never look upon many of the works which our captain, lieutenant, and ensign viewed with such enthusiastic admiration. They lived near the end of the art-producing ages, and we, it is to be hoped, near the end of the art-destroying ones.

In the Close at Lichfield there was a spacious hall, raised some dozen steps above the ground. Its roof was of "Irish timber," richly and curiously carved. A great part of the carving was gilded, and the roof was covered with lead. At Burton, the travellers found a great cathedral-like church, but naked, bare, and plain. Their tastes were evidently not for that baldness which in later times people used to call simplicity. All Hallowes, Derby, pleased them better. Its beautiful tower, 70 yards high, was built, they tell us, in King Henry the VIII.'s days at the cost and charges of some young men and maidens. An inscription to that effect was engraved on the outside of the steeple. Inside the church were the tombs of Parson Johnson, Mr. Crashaw (a London merchant), and Lady Shrewsbury. This last tomb was of marble, alabaster, and touchstone from her ladyship's own grounds in that district. At Nottingham was found a town which was nothing but rock whichever way they walked. Most of the cellars, as many of them still are, had been hewn out of the sandstone, and many dwellings also. Of these last few now remain, for the material wastes away rapidly when exposed to weather and hard usage. At Leicester the ruins of the Temple of Janus were exhibited near St. Nicholas Church. Coventry interested our tourists much. Here they rested very quietly and contentedly, and in the morning addressed themselves to a stately, fair church, which for largeness, lightness, and neatness might compare with many cathedrals. This, of course, was St. Michael's. Its tower was built, they state, by two maids at a small charge. Bray, who saw it in 1777, says that St. Michael's steeple was begun in 1373, and finished in 1395, by William and Adam Botoner, who expended £100 a year on it. At this rate the tower and its lantern cost £2,200. The spire was added by two sisters, Anne and Mary Botoner, in 1434. The total height is given as 300ft., which agrees very closely with that shown on Mr. J. O. Scott's beautiful drawing, which we published some years ago. The two sisters' "fair gravestone in brass" was still to be seen in 1634, though somewhat defaced. Coventry then had a strong wall, three miles in circuit, twelve gates, and many towers on the wall; but its three spires, as now, made up, as far as steeples were concerned, the whole city. Kenilworth Castle was not yet in ruins. Its great hall had a handsome roof of "Irish wood." There were rich chimney-pieces of alabaster, black marble, and curiously-carved joiner's work; luxurious rooms in the spacious tower repaired at great cost by that "favourite of late days, Robert Dudley, Earl of Leicester," and, above all, there was the plain, private chamber which "our renowned Queen of ever-famous memory" always selected for her own.

Warwick was the next attraction. Near it, and by the high road, was a leaning cross. The castle is described as "most sweetly, and very pleasantly, seated on a rock, very high, upon that river, the Avon, which divides the shire in twain." The grounds were adorned with all kinds of delightful shady walks and arbours, groves, and wildernesses; with fruitful trees, delicious bowers, odoriferous herbs, and fragrant flowers. There were many curious fishponds, hewn out of the solid rock, like cisterns, and well-stocked with fish. The Beauchamp Chapel was found to transcend report. Its glass windows were richly and curiously painted, and its monuments to Richard Beauchamp, Earl of Warwick; Robert Dudley, Earl of Leicester; Ambrose Dudley, and Thomas Dudley, Earl of Warwick, are commemorated in a long description. In Stratford-on-Avon church was a monument to the Earl of Totnes, one to Sir Hugh Clopton, "a neat monument of that famous English poet,

Mr. Wm. Shakespeare, who was born here"; and "one of an old gentleman, a bachelor, Mr. Coombe, upon whose name the said poet did merrily farm up some witty and facetious verses." These verses, it appears, could not be copied for want of time. What golden opportunities of acquiring information about Shakespeare, so soon after his death, the writers of this diary must have missed! How grateful the literary world would have been for the least addition to its knowledge about him; and how near these three officers of the Military Company at Norwich came to securing a sort of adventitious immortality!

From Stratford they went on to Worcester, and thence to Hereford. There they stayed at an alderman's house—"a host of both quality and reckoning. For the former his breeding showed it, and for the latter our purses have cause to remember it." The city had a strong wall, nearly two miles round, with six gates and many watch-towers. There were six churches, "with their old mother church," which, in her outward habit, appeared very like her sister of Carlisle. Still, the cathedral had some brave monuments, including those of eight Norman bishops and many later ones. The chapter-house was little inferior to any, and contained some good antique windows in fair colours. On its walls there were 46 old pictures, curiously drawn and set out. These included Christ and the Twelve Apostles, Edward the Confessor, St. Chad, St. Winefride, and other holy women, as also certain benefactors to the church. In the midst of the chapter-house was a pulpit, from which every canon, at his first entrance, had to preach four Latin sermons. The Hall of the Vicars-choral, where they dined together, was adorned with richly-painted windows. They had a library of their own, and a good supply of cordial liquor. Our travellers were loth to leave them; but after breakfast they took horse and posted to Gloucester. They entered it over a very fine arched bridge, and found in the middle of the city a handsome cross, at which the four principal streets met. There were twelve churches, of which the cathedral, then called the College Church, was one. In this they were greatly entertained with a "strange and unparalleled whispering-place of 24 yards circular passage, about the high altar, next to the Lady chapel." On the north side of the high altar was the tomb of a Saxon king, bearing the old church upon his breast. Elsewhere there remained the monument of Robert, Duke of Normandy and eldest son of William the Conqueror. His portraiture was "of Irish wood, painted, which neither rots nor worm-eats." What kind of wood was this? Not Irish bog-oak, because roofs are described in this diary as having been made of it. Was there the same sort of popular belief in the 17th century about Irish wood which there still is about chestnut? To this very day the constable in charge at Westminster Hall informs strangers that its roof is made of horse-chestnut wood, so that no spiders or other insects can live there!

Saturday, Sept. 12, found the travellers at the great city of Bristol, then second only to London. Here, again, there was a fair cross between the two bridges. It had been lately and richly beautified, and was hardly inferior to the celebrated one at Coventry. At this cross four streets met, namely, High-street, Broad-street, Wine-street, and Corn-street. Bristol had 18 churches, and it is particularly noted that their pulpits, on which the citizens have spared no cost, are most curious. Nor was the outlay wasted, if we may believe the assertion in the diary, that "they daily strive, in every parish, who shall exceed the other in their generous and religious bounty." The buildings of Bristol, and especially the churches, were most strong and sumptuous, except the cathedral, of which there was little in existence besides the choir. "Ratcliffe Chapel," as it is here called, with its "artificial imboved arched roof, all built of freestone," far surpassed it in beauty. The rich citizen who built it, and who had been five times mayor, finally took holy orders "to avoid marrying one of the King's concubines." He died Dean of Westbury, and built there a college for canons. The next place visited after St. Mary Redcliffe was St. Vincent's hot well. Then these officers "laid aside their commanding postures, and turned pioneers, to dig and delve for glittering bastard diamond stones, which that hill plentifully afforded." Passing the neighbouring lead mines, they came to Wells, "another cockpit city." Much admiration was bestowed on the

towers, and on the sculptures of the west front. The fine windows of the chapter-house, "neatly painted with the history of the Bible," the bishop's palace, the vicar's college, and the cathedral cloister are all described in glowing terms. They saw Glastonbury Abbey—then in ruins except its tower—at a little distance, and would have gone nearer if they had felt sure of seeing the grave either of King Arthur or of Joseph of Arimathea. They were even sceptical about the winter flowering of the Glastonbury thorn, though this is no miracle, but a botanical fact. Two old trees of this variety were still growing near the abbey early in the present century. They flowered in May, and again, less freely, in December, and were considered to be of the same species as the common hawthorn.

The tourists had reached their western limit. They turned and made for home, one passing through Bath, Malmesbury, Cirencester, Sherborne (Gloucestershire), and Burford to Oxford, and the others reaching the same town by way of Salisbury. There is a long and interesting description of the figure-subjects of the south porch at Malmesbury. There were about 25 of these on each of three arches, beginning with Light from Chaos, going on with the Creation, the Fall, the Death of Abel, the Building of the Ark, the Offering of Isaac, and the greater part of the Old and New Testament history. There is also a good account of Woodstock. From Oxford a pretty direct road was taken to Cambridge, and thence to Norwich. Our three companions got safely home on the 26th of September, "having marched 800 and odd miles, passed through 26 famous shires and counties, billeted handsomely in 15 fair and strong cities, doubled, and offered up devotions in 13 ancient, rich, and magnificent cathedrals, and closed in the rear with the two universities." They pass out of sight, and we meet them no more. In a few years the Civil War began. Did they fight for King or Parliament? Did they survive or fall? There is no knowing. "Their swords are rust, their bones are dust, their souls are with the saints, we trust."

THEATRES.—II.

By ERNEST A. E. WOODROW, A.R.I.B.A.

THE necessity of good sound construction in building theatres was commented upon by Saunders in his "Treatise upon Theatres," published over a century ago. In this work he says:—"The whole of the theatre should be surrounded by a thick wall, as well next the stage as on every other part. Over the opening of the stage an arch may be turned, on which the wall may be continued up through the roof, so as to prevent all communication of the timbers." Here a hundred years ago the proscenium wall, which has only been universally adopted in recent years, was advocated. To continue quoting Saunders:—"The passages communicating with the boxes should all be arched, and have an easy access to spacious stone staircases that would, in case of fire, enable the audience to depart without the least hazard; and though it be necessary to confine the entrances to a few in number, yet there ought to be many large doors, hung on the outside, ready to be thrown open at the conclusion of the performance, and upon any sudden alarm." In a footnote the writer says: "The dreadful consequence of doors hung on the inside cannot be too much attended to, thousands have fallen a prey to the flames, through that single circumstance, when an alarm takes place all are eager to gain the outside, and the crowd carry the door with them till it shuts; others pressing forward prevent it being opened, and thus they are confined to destruction."

I may be accused of referring to what is known by every architect when I draw attention to the above words of Saunders; but I ask why, if every architect knows the necessity of this simple means of increasing the safety of the public, do we find thousands of churches, chapels, lecture halls, and other places where the public assemble in large numbers with the doors opening inwards? Architects cannot plead ignorance.

To return to Saunders's description of structural detail. "Partition walls," he says, "should be carried quite through the roof in as many places of the building as opportunities afford; and no one would neglect to render it insulated where it is possible."

This last sentence brings me to the all-im-

portant and much-discussed question of what is a suitable site for a theatre? What is a safe site? Saunders practically says an isolated site when you can get it, and that, in fact, puts the whole question in a nutshell. It has been argued again and again that on the Continent, isolated sites are obtained, because state aid is available, and that managers can thereby afford to procure better sites. There are, however, other difficulties in addition to that of the prohibitive cost which have prevented English managers obtaining perfectly isolated sites; theatres to be made to pay must be situated in the densely populated or fashionable quarters of the town, and within a very limited centre. Here land is not only dear, but very difficult to obtain at any price, and it is only when such rare opportunities arise as local street improvements, that the enterprising manager has the remotest chance of finding a suitable and isolated site for his theatre; when he has that, fortunate is the architect who has the theatre to design, for his work should then be all plain sailing. One point must not be lost sight of: that it is on the Continent that the worst disastrous panics and losses of life have occurred. The cause of this, however, is not so much from structural defects, as from the fact that our Continental neighbours are of a more excitable temperament, and rush into a stampede sooner than the cooler-headed Britisher. Much, too, is due to the foresight of the British manager.

To meet the demands of the circumstances under which we are thus placed, we do not find the rules as to site enforced in England so stringent as those of the continent. The rule of the London County Council reads as follows, and I have endeavoured, by the aid of a diagram, to illustrate this regulation:

"One half, at least, of the total length of the boundaries of the site of any such premises which consist of an entire building, and in case of a room or other such premises not consisting of an entire building, one half, at least, of the total length of the boundaries of the site of the building of which such room or other such premises form part, shall abut upon public thoroughfares, of which one thoroughfare at least shall be not less than 40ft. wide, and of the remainder, none shall be less than 30ft. wide if a carriageway, or 20ft. wide if a footway.

"If, in compliance with Regulation No. 10, an additional passage or way should be necessary, it may be provided by means of a private passage or way.

"Such passage or way shall not be less than 10ft. in width, and under the complete control of the owner of such premises, and no doors, windows, or other openings of the adjoining premises shall communicate therewith, or overlook any portion of such passage or way."

Regulation No. 10 reads as follows:—

"Two separate exits, not leading into the same thoroughfare or way, shall be provided to every tier or floor of such premises.

"If any tier or floor shall be divided into two parts, two separate exits, not leading into the same thoroughfare or way, shall be provided to each of such parts.

"Such exits shall be arranged so as to afford a ready means of egress from both sides of each tier or floor, and shall lead directly into a thoroughfare or way."

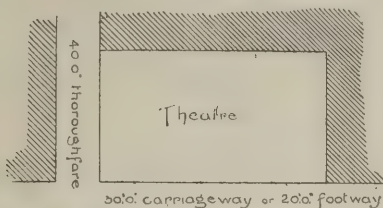
As the circumstances and difficulties are somewhat similar in the City of New York as in London, it is interesting to compare the regulations there enforced with that already quoted.

"Every theatre, opera-house, or building hereafter erected for theatrical, operatic, or for any public amusement, or the remodelling of any building for the aforesaid purpose, shall have at least one front in the public highway or street, and in front there shall be suitable means of entrance and exit for the audience. In addition to the aforesaid entrances and exits on the public highway, there shall be reserved for service in case of emergency, in every such building, an open space equal to one-sixth of the width of the building, outside to outside measurement, and in no case less than 8ft. in width in the clear in its narrowest part, on the one side not bordering the street, where the building is located on a corner plot, and on both sides of said building, where there is but one frontage on the street."

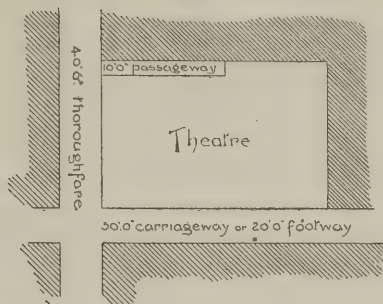
Since the preparation of this diagram, the Laws relating to the Construction of Buildings in the City of New York have been this year

amended, and some interesting variation is made in the required width of the open space at the side of the theatre, the dimension being rightly governed by the seating capacity of the house.

The amendment allows that the width of the



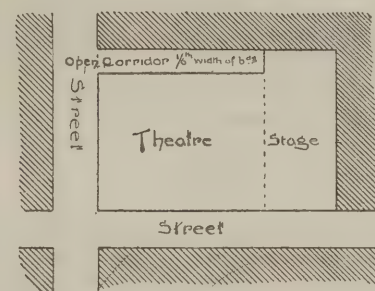
Site plan in accordance with the rules of the L.C.C.



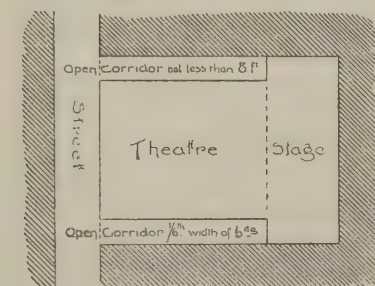
Site plan in accordance with the rule No. 10 of the L.C.C.

open court or courts shall be not less than 7ft., when the seating capacity is not over 1,000 people; above 1,000, and not more than 1,800 people, 8ft. in width; and above 1,800 people, 10ft. in width.

The open court or courts shall begin on a line with or near the proscenium wall, and shall extend the length of the auditorium proper, to



Site plan on a corner block in accordance with New York rules



Site plan in a thoroughfare in accordance with New York rules

or near the wall separating the same from the entrance lobby or vestibule.

"A separate and distinct corridor must be provided in a New York theatre to continue from the open spaces to the street through such superstructure as may be built on the street side of the auditorium. These corridors must in no

case be reduced in width more than required for the thickness of the outer wall forming one side of the corridor, nor are they to be more than 3ft. narrower than the open spaces. The openings to these corridors must have doors or gates opening outwards towards the street; the outer or street gates may not project beyond the street line when open. Recesses not exceeding 4in. in depth are to be left in the walls at the sides to receive the gates when open, so as not to diminish the width of exit. During the performance the doors or gates must be kept open by strong locks."

With regard to the compulsory open spaces at the sides of a New York theatre, they must at no time be used for storage purposes, or for any other purpose but the legitimate use of exits. This is purely a question of management. "The level of the corridors from the open spaces must not be more than one step above the side walk."

With regard to Continental regulations, we find in St. Petersburg, Brussels, and Italy perfect isolation is insisted upon, and in Brussels, where the surrounding open space is less than 10ft. 6in. wide, there must be no windows overlooking the theatre belonging to adjoining premises. This, of course, is to prevent fire or smoke from neighbouring houses entering the theatre and causing false alarm. The London County Council insist that no theatre shall be erected upon a site within 20ft. of any windows or other openings belonging to any other premises overlooking the site.

In Austria only the large theatre need be perfectly isolated; the smaller play-houses, holding less than six hundred spectators, may have the back wall of the stage abutting on other premises. In Paris, theatres may be built either attached or detached. In case of their being detached, there must be left on all sides, with the exception of those adjoining the public way, a clear space or passage way not less than 9ft. 10in. wide, providing the neighbouring houses have no openings upon the said passage. If such is not the case, the width must be increased in proportion to the size and general arrangement of the building. No doorway may be formed between the passageway and any portion of the adjoining premises in the case of a Paris theatre which is detached, nor any communication formed between any portion whatever of the theatre and the adjoining premises, in case the theatre is attached.

The vast importance of the judicious choice of site can be more clearly seen from the references I have made from various codes of regulations, than from any arguments of mine. Not only must the site be considered with regard to obtaining ready and ample means of exit, but also as to the nature and character of the surrounding premises, the risk that will be incurred, if any, from the contents of such premises, and from the nature of the trade carried on therein. One would not choose a site next to a timber yard, or abutting on a fire-work factory; it must always be remembered that it only requires the smell of a puff of smoke to cause one of the audience to cry fire, and the whole house to get up in a mad rush. The site question is, therefore, an all-important one, and I do not hesitate to say that one cannot build a good or safe theatre on a bad site. It is obvious, that many exits leading directly into the streets, must assist towards securing the safety of the public. The number of exits and their fitness depend entirely upon the appropriateness of the site: a site must be found to suit the plan, not a plan to suit the site.

The rules and regulations that are enforced in various towns and cities at home and abroad, have forbidden the building of a place of public entertainment upon a plot of land behind a row of houses facing the street. These backyard theatres, which, fortunately for public safety are things of the past, were entered by long narrow passages passing through other premises in other occupation in no way separated from them by fire-resisting walls and floors. In some cases these entrances were part of the ground floor of dwelling-houses, and if at any time fire had occurred in the living-rooms over, the entrance to the theatre would have been completely cut off as a means of escape.

When such condition of affairs as these existed, people satisfied themselves that "extra exits," "alarm exits," or "emergency exits" (falsely so-called) would be available when wanted. Now, from years of observation and study of this class of building, I may assert without hesitation that people always will go out the way they come in.

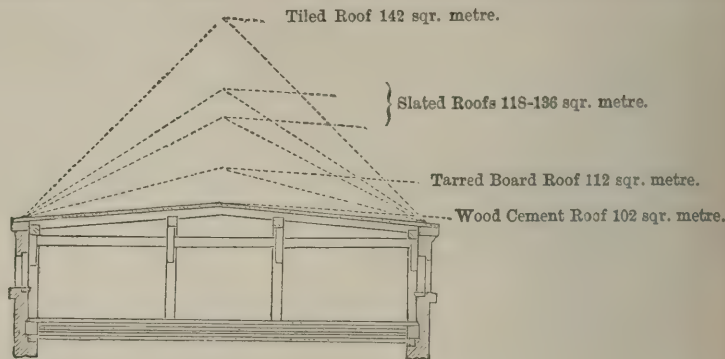
and the only exception to this rule is among the *habitués* of a theatre, who know their way about the theatre as well as they do about their own houses. I know of one theatre where from the stalls seats the street can be seen through the exit door, and yet the public prefer going upstairs to the dress-circle level and down again to the street, because they came in that way. I illustrate this instance to show how the public are most difficult to deal with, and will not take advantage even in calm moments of the extra exits provided.

Entrances and exits should be so planned as to correspond and balance the one with the other, and this calls for a symmetrical plan, a simple plan—a plan that can be taken in at a glance, the one side corresponding with the other—a pit exit on the north, and a pit exit on the south; a gallery staircase on the right, a gallery staircase on the left. To obtain this all depends on the site: either the site must be isolated or passageways must be given up by the owner, to leave open spaces on both sides of the auditorium, as required by the New York regulations. I shall have to dwell more fully upon the symmetrical arrangement of entrances and exits when dealing with the chapter upon this detail of theatre planning.

Before leaving the all-important question of site, I may, perhaps, be permitted to quote Sir Eyre M. Shaw upon this point. He says: "If a theatre be surrounded on several sides by other buildings, it should have no windows or other openings in the direction of those buildings, and care should be taken that it should be so constructed that it would be impossible for it to be affected by anything happening in them. The practice, for instance, of allowing the roof of a building to lean against a theatre wall with openings in it above the point of contact is one wholly inconsistent with the safety of the visitors of the theatre. No rule can be laid down as to the distance to be allowed in towns, as so much depends on the nature and contents of the adjoining buildings, and the purposes for which they are used; but in any special case it requires but a very small exercise of intelligence to ascertain instantly by personal observation whether fire could be communicated or not."

HEIGHT OF BUILDINGS IN CHICAGO.

The Common Council of Chicago have issued a rule affecting the height of buildings, which is, briefly, that no building shall be hereafter erected in the city of a height exceeding 150ft.; that if the street is not more than 80ft. wide, no building upon any street or plot abutting thereon is to exceed 125ft.; and that no building exceeding 100ft. in height shall be erected upon any street, or lot abutting any street, the width of which is not more than 40ft. Where, however, any building is erected with frontage upon two or more streets of different widths, the height of such building shall not exceed the average of the maximum heights which are permitted. For example, where a building is erected fronting two streets of 40ft. and 80ft. respectively, the height shall not exceed 112½ft. But if any building is set back in whole or in part from the street line in such manner as to increase the width of the street in front of the same, or in front of any part, not less than one-third of such building, then an increase in the height will be permitted directly in proportion to the aggregate increase in the width of the street so made; but no building exceeding 150ft. shall be so increased in height, nor shall the height of any building be so increased as to exceed 150ft. It is provided, moreover, that parts of buildings may be carried to greater heights back of and within a line drawn from a point in the opposite side of street at the established grade, through the highest point of wall of said building next to street; but no building exceeding 150ft. in height shall be so increased in height. Spires, towers, domes, or cupolas limited to an area of 15 per cent. of the ground area of building may exceed the above heights. These limitations certainly exceed those which sanitary and æsthetic conditions would suggest. For example, a structure 100ft. in height in a street of only 40ft. wide is excessive, as that height exceeds twice the width of street, and would seriously interfere with the light of lower rooms, at least in this country, but the difference of latitude has to be taken into consideration.



SAND, EARTH, AND GRASS ROOFING.

IT is very interesting to learn that there are roofs which need no gutters, and which are so flat that upon them gardens, terraces, bleaching and drying grounds, &c., can be placed. We herewith draw the attention of our readers to these roofs, which have already gained for themselves the highest approval of magistrates and other competent persons in Germany and adjacent countries for buildings of all kinds, but are not known yet, or very little, in England, where, however, they were patented a short time ago. There certainly seems room for them in this country, if only that they render possible a small garden, or at least a piece of lawn, on the tops of our houses, where now and then we can enjoy an undisturbed hour in something like fresh air. These roofs have been in use in Germany about fifty years, and have proved to be not only absolutely watertight, but also thoroughly fireproof, and give the highest protection against storms, heat, cold, dust, snow, hail, &c. They can be adapted to every building and to every climate. They are very cheap, and in manufactories about 40 per cent. of surface is gained, and very considerable expenses in wood and wages are saved, as the windows are very easy to be placed and light is gained. These roofs can be constructed with slopes towards the middle, so that the rainwater will be conducted through hollow pillars or tubes into basins placed in the middle of the building, where it can be employed for several purposes. These roofings are being introduced into our country by Mr. C. F. Beer, architect, of Cologne (Rhine), and Mr. Alan B. Crombie, of Dumfries (now his representative), was the first architect who made a trial of them in England, which has been proved most satisfactory. The above illustration shows the various roofing methods and their superficial contents in comparison with the wood-cement roof, and show that the latter possesses the least roof surface.

DIFFICULTIES ENCOUNTERED IN THE SEVERN TUNNEL CONSTRUCTION.

In constructing the Severn Tunnel the chief precautions had to be taken to resist the water pressure, which, of course, is equal all round, and according to the head of water at each point, and these converging pressures have to be resisted by the brickwork. Thus the vertical load is converted into a thrust, or bed pressure, all round, and these bed pressures are much greater than the water pressures outside, and vary in proportion to the radius of curvature of the arch. In a paper read by Mr. Charles Richardson, M.Inst.C.E., of Bristol, on "The Severn Tunnel," the author alludes to this question of pressure in a river tunnel, and observes: "The result, therefore, is that, while the water pressure on the crown of the arch is 52lb., the bed pressure in the arch is 3.15cwt. on the square inch; but the invert being of a flatter radius, while the water pressure is 64½lb., the bed pressure is 6.09cwt., or just about double what it is on the arch; so to make them of equal strength against water pressure the bed should be twice as thick as the arch."

Our readers will readily follow this reasoning, and will understand the necessity of making invert arches of segmented form much thicker than the crown arches of structures of this kind, subject, as they are, to converging pressures from without, and which are intensified in the beds between the *voussoirs*, especially those beds in which the "line of pressure" does not

coincide with, as in those of the invert, the flat curve of which may be regarded as a flat arch under a great load. Unless it is made thick, the line of pressure would be close to the intrados at springing, and would pass close to the extrados at crown. In the Severn Tunnel the 27in. invert would have been strong enough to bear the thrust if the load had been distributed, but it actually "gave way in some places in the wet part of tunnel, where it passed through a bed of hard conglomerate rock; for nearly twenty chains in the neighbourhood of the big spring was so full of water under great pressure, which made it spurt out in all directions, that the miners had considerable difficulty in keeping any light burning by which they could see to work." The bricklayers also experienced difficulty from the same cause, and considerable labour was entailed in putting in the invert in the wet places, for after the bottom had been made for the brickwork, the clear water welled up in large springs from the joints, and from every fissure in the rock all over the excavated floor. If the brick invert had been laid on such a bottom, the pressure of water upwards (60lb. to the inch) would have raised the brickwork up in a body, or forced its way through the joints, washing out the cement. To avoid this evil the water pressure was taken off by 3in. iron pipes against all the springs in the side and upper walls, and by a 12in. stoneware pipe cut through the rock under centre of invert, so as to drain off the leakage during the construction, and to allow the cement to set. The brickwork consisted of six 4½in. rings in the arch and invert, bonded work in the side walls. After corking up the pipes and stopping the invert drain six months after the brickwork had been finished, to give time for the cement to set, the pressure gradually came against the brickwork till the pressure of 60lb. per inch was reached. As soon as this pressure was felt, streams of water spurted through many joints of the work with much force, and sometimes a flake 2in. thick would fly off with a pistol sound. On the invert the water pressure was most remarkable. A patch of 20 or 30 square yards of the top ring of brickwork could be seen to rise slowly till it fell to pieces a heap of loose bricks. These were cleared away, and soon the second ring began to rise slowly and fall to pieces, and the third ring followed in the same manner. To prevent further destruction to the invert, the contractor uncorked the pipes and took the pressure off.

At a meeting of the Royal Hibernian Academy of Arts, held on the 18th inst., Mr. J. L. Robinson and Mr. Johnston Inglis, Associates, were elected constituent members of the Royal Hibernian Academy, which elections have since received the approval of his Excellency the Lord Lieutenant. We congratulate Mr. Robinson, who is well known to members of the London Architectural Association as the honorary photographer of the excursions and as a racy lecturer, on his well-deserved honour.

The Halifax borough engineer, Mr. Escott, has issued a report to that body on a proposed scheme for dealing with the borough sewage at Salterhebble. The scheme suggested is one by gravitation, although eventually it may be found necessary to pump the sludge upon higher ground—the water in the Hebble brook to be utilised to drive a turbine for working the pump. After two years of experiments, the conclusion arrived at is to construct settling tanks, precipitation tanks, and sludge filter beds, and to treat the sewage with chemicals. The estimated cost, exclusive of land, is £14,000, and the annual expenditure, again exclusive of land, £2,000. The cost of the land is £5,683.

CONTENTS.

The Client and the Architect	131
National Competition of Schools of Art	131
Japanese	132
Stability of Walls on Soils.—II.	134
Builders' Benevolent Institution	136
Prices.—XLI.	136
An Architectural Tour in 1634	137
Theatres.—II.	138
Height of Buildings in Chicago	140
Sand, Earth and Grass Roofing	140
Difficulties Encountered in the Severn Tunnel Construction	140
The BUILDING NEWS Directory	XI
Our Illustrations	141
New Free Public Library at Stoke Newington	141
Admissions to Architectural School, Royal Academy, July, 1892	141
Wayside Notes	160
The Recent Election of the A.A. Committee	160
Carpentry and Joinery.—XLV.	161
St. Sepulchre's Church, Holborn Viaduct	162
Obituary	162
Competitions	162
Building Intelligence	163
Engineering Notes	163
Architectural and Archaeological Societies	164
Intercommunication	164
Legal	164
Legal Intelligence	165
Water Supply and Sanitary Matters	165
Our Office Table	165
Trade News	166
Tenders	166

ILLUSTRATIONS.

SKETCHES IN SPAIN, BY W. H. SETH-SMITH, F.P.S.A., F.R.I.B.A.
—SELSDON PARK.—TURRET STAIRCASE, STANMORE HALL.
—DESIGN BY MESSRS. PERKIN AND CHESTON FOR THE
OXFORD MUNICIPAL BUILDINGS.—TWO HOUSES AT BEN-
SILTON AND SUTTON.—OLD OAK FURNITURE, A SIX-
TEENTH-CENTURY BUFFET.—CHRIST CHURCH, HAM HILL,
KENT.

Our Illustrations.

SKETCHES IN SPAIN.

THESE water-colour sketches of Andalusian architecture were made by Mr. W. H. Seth-Smith during his tour in Spain last winter. It is no use to attempt out-of-door sketching elsewhere at that time of the year; but in Spain, unless the season is exceptional, lovely weather may be counted upon up to the end of December. The Court of Oranges, in front of the Mosque of Cordova, seen in the brilliant sunlight at that season, when the trees are laden with ripe oranges—with its grand bell tower, fountains, its great orange and olive trees and palms all inclosed in arcades and walls of crumbling grey and yellow stone, and rich brown tile roofs to the cloisters, and green sward—is a dream of beauty never to be forgotten. Cordova is certainly one of the most picturesque, as well as one of the most interesting, of southern Spanish cities both to the artist and to the architect. The Giralda Tower, in Seville, is drawn by everybody, and well repays the draughtsman for his trouble. There is no more successful example of adaptation of Renaissance architecture to an existing pagan building, and the details of the Moorish work in this tower are most refined, and worthy of close study. A Courtyard in Seville forms an entirely self-composed subject, and is to be found immediately to the north of the church of St. Salvador.

SELSDON PARK.

SELSDON in Sanderstede, in the 10th century was the property of Duke Elfred, a Saxon nobleman, and formed part of the manor of Sanderstead long before the Domesday Survey. After the dissolution of the monasteries by Henry VIII., Sanderstead, with Selsdon, passed into the hands of John Ownsted, Serjeant of Carriages to Queen Elizabeth. At a subsequent period the property belonged to the Bowyers, and afterwards became the property of Wm. Coles, who in 1809 sold it to Geo. Smith, M.P. The house was more lately tenanted by the Bishop of Rochester (Dr. Thorold), and is now the property of William Stevens. By this time the building had degenerated into a stucco baronial hall, but has now been entirely refaced with red brick and stone dressings, and the interior elaborately decorated and refitted, from the designs of Mr. W. F. Unsworth. The builders were Messrs. W. H. Lascelles and Co., London. The plumbing and drainage was done by Messrs. Norris and Sons, Sunningdale. The stone-built conservatory, from the designs of Wyatt and Brandon, remains untouched. The upper view herewith illustrated is now being exhibited at the Royal Academy.

TURRET STAIRCASE, STANMORE HALL.

STANMORE HALL is a fine mansion situate in the north of Middlesex, and commanding splendid views in the neighbourhood. It has recently been largely added to for Mr. W. R. D'Arcy, the present owner. The turret staircase leading to the rooms occupied by the family we illustrate to-day. On plan it is octagonal, with a square well-hole, the four newel-posts running right up from the ground to the second floor. Steps only occur upon four sides of the octagon, the other four forming triangular buildings. All the soffits of the stairs are panelled, and the whole is executed in wainscot, the walls being built of Beer stone. The windows are filled with quarry glazing of Venetian rippled glass and opalescent glass, which, when seen against the sky, shows a soft golden tint, but against the buildings a milky white. The glass was supplied by Messrs. Simpson and Son, of St. Martin's-lane. The whole of the rest of the work was executed by Messrs. George Grimwood and Sons, of Sudbury, except the carving, which was executed by Messrs. S. W. Elmes and Son, of South Kensington. The drawing is by the architect, Mr. Brightwen Binyon, A.R.I.B.A., of Ipswich.

OXFORD MUNICIPAL BUILDINGS.

We have now so fully illustrated all the five designs submitted in the final competition, that very little indeed remains to be said in respect to this sheet, which further represents the design sent in by Messrs. Perkin and Cheston. Their plans, elevation, and details figured among our plates on the 8th and 15th inst. The present drawings show the two leading sections giving particulars of the Town-hall and its approaches under the tower, which formed the main feature in the chief front of their buildings.

TWO HOUSES AT SUTTON.

THESE houses have been lately erected from the designs of Mr. H. D. Searles-Wood, F.R.I.B.A. "The Nook," shown by the upper sketch, was built for the architect's own occupation. Inside there is an interesting old oak staircase, which was taken out of a house in Burlington-street, W., and the mantelpieces came from some old houses which were pulled down in Liverpool-street when the Great Eastern Railway Company enlarged the terminus. Both houses are erected in local red bricks, and tiles for the hanging tiling. Broseley tiles are used for the roofs. The house shown by the lower view is situated on the Brighton-road, and belongs to Mr. Herbert Carty. Mr. G. Burrage, of Sutton, was the builder of "The Nook," and Mr. J. B. Potter, of the same place, erected the other house.

OLD OAK FURNITURE.

THE buffet, a beautiful piece of 16th-century furniture, is of Italian workmanship entirely, carved out of dark oak; and it is surmised from the character of the figures, angels, cherubim, &c., some of which have chaplets round their necks, that it was executed in a monastery by an order of monks who distinguished themselves in the art of wood-carving. The buffet was purchased at a sale of the furniture of the late Mr. F. C. Scott, in Swansea, and was bought by him some thirty years ago at the sale of the furniture of the late Mr. Powell at Craig-y-Nos Castle, now the residence of Madame Patti. It can be traced to have been in Mr. Powell's family over 100 years. It is in a most excellent state of preservation. The dimensions are 5ft. 3in. high, 3ft. 10in. wide, and 1ft. 3in. deep. The doors are 2½in. thick, solid, elaborately carved inside, below these doors are two drawers, together with a sliding shelf, shown partly open in the sketch. The buffet proper is supported at the two front angles by caryatides. The back of the lower portion is richly panelled, and the whole stands on a substantial pot-board. This piece of furniture is the property of Mr. Charles T. Ruthen, of Swansea, and we are indebted to him for sending us the photograph (taken by Mr. H. A. Chapman, of Swansea), from which our sketch was made. The two Italian chairs are fine specimens of design in scrollwork, showing great fertility of invention and ingenuity in producing a dignified result, the scale of the parts being maintained with considerable skill. They are located in the Bargello at Florence.

CHRIST CHURCH, HAM HILL, KENT.

THIS church was begun on the 1st March, and is to take nine months to complete. The estimated

cost is £2,000, without taking into account the tower and other work, the cost of the former being put at £600. The building is to seat about 270 persons. The church was started by the late Vicar of Birling, in consequence of the houses of Lower Birling being built almost adjoining those of Snodland. The ground has been given by the Rev. Canon Coulson, of Bramley Vicarage, Guildford. Mr. H. P. Monckton, F.R.I.B.A., of 32, Walbrook, London, E.C., is the architect. Mr. Robert Langridge, of Birling, is the builder. The church is designed in the Early English style.

NEW FREE PUBLIC LIBRARY AT STOKE NEWINGTON.

ON Saturday last Mr. J. Passmore Edwards, whose help has materially assisted its establishment, at the invitation of the Commissioners, and the leading inhabitants of the parish, opened the new Free Public Library in Church-street, Stoke Newington. We hope to illustrate the building shortly, which is certainly one of the most complete and suitable we have ever seen erected for the money.

The Commissioners procured ten designs for the new building, and selected one submitted under the motto "Spes," which was found to be that of Messrs. Bridgman and Goss.

This design was in due course sanctioned by the Local Government Board, and tenders were invited for the erection of a building in accordance therewith. Twelve tenders were obtained, the highest being for the sum of £3,262, and the lowest (that of Mr. W. M. Dabbs, of Stamford Hill) for the sum of £2,648, which was accepted, and the building is now completed.

ADMISSIONS TO ARCHITECTURAL SCHOOL, ROYAL ACADEMY, JULY, 1892.

UPPER SCHOOL.—H. P. Adams, C. W. Baker, J. Borrowman, jun., A. W. Cleaver, P. G. Newbon, R. A. Reid, A. Dunbar Smith, A. B. Yeates.

LOWER SCHOOL.—H. B. Cresswell, W. H. Hazell, T. G. Lucas, A. A. Reeve, H. A. Saul.

CHIPS.

The Queen and the Prince and Princess of Wales have decided on the design of the sarcophagus in which the remains of the late Duke of Clarence are to be placed in the Memorial Chapel at Windsor Castle. The marble for the tomb has been sent to England by the Empress of Austria. The work has been intrusted to Mr. Alfred Gilbert, R.A.

The new baths and washhouses in Roman-road, Bow, were formally opened on Wednesday evening. They have been erected from designs by Messrs. Hamor and Pinches, of John-street, Adelphi, W.C. The whole of the skylights are glazed upon the patent system of W. E. Rendle and Co. of Westminster.

Messrs. Ross, the contractors for the new Black Isle Railway from Muir of Ord to Fortrose, a distance of 13½ miles, were able to convey stock on Monday from the station at Munloch to the Highland Society's show at Inverness. The distance from Muir of Ord to Munloch is about eight miles, and although not yet passed by the Board of Trade inspector, the line is all but ready for opening for traffic. On to Fortrose the construction is, notwithstanding the difficult nature of the works between Munloch and Arroch, in a very advanced state.

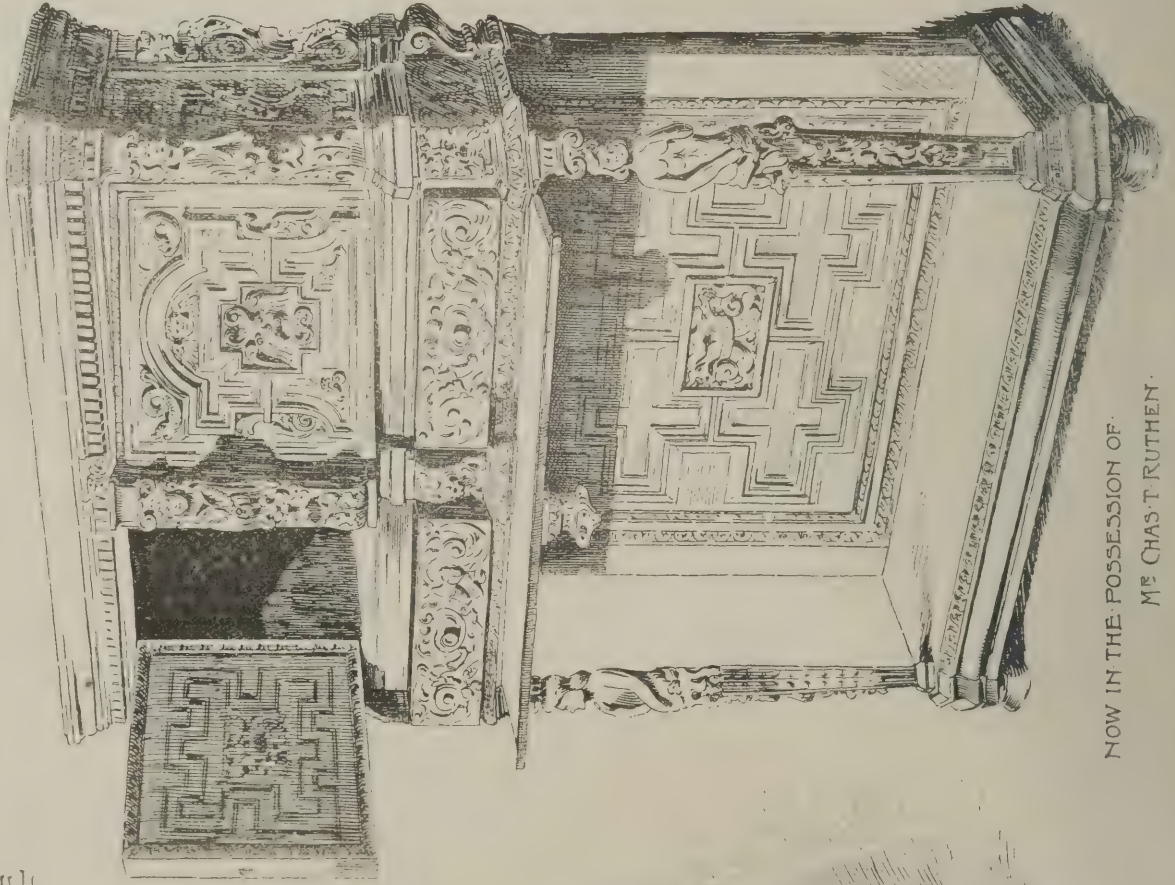
At a meeting of the City Commission of Sewers on Tuesday, it was reported that the buildings on the south side of Ludgate-hill had been pulled down, and that the widening of this thoroughfare, which has been 20 years in progress, is now virtually completed.

The General Works Committee of the Coventry city council brought to a conclusion on Tuesday a protracted consideration of the question of the disposal and treatment of the sewage. Mr. Mansergh was recently consulted as an expert, and he submitted three alternative schemes, the largest of which was recommended as the most advisable. The scheme is one of broad irrigation in the Avon Valley between Brandon and Rytton-on-Dunsmore. The report will be presented to the council at its meeting three weeks hence.

The North Bierley Joint Hospital, Low Moor, is nearing completion. It is being warmed and ventilated throughout by means of Shorland's patent double fronted Manchester stoves with descending smoke flues, and patent exhaust roof ventilators and inlet tubes, the same being supplied by Mr. E. H. Shorland, of Manchester. Mr. W. Longley, of Bradford, is the architect.

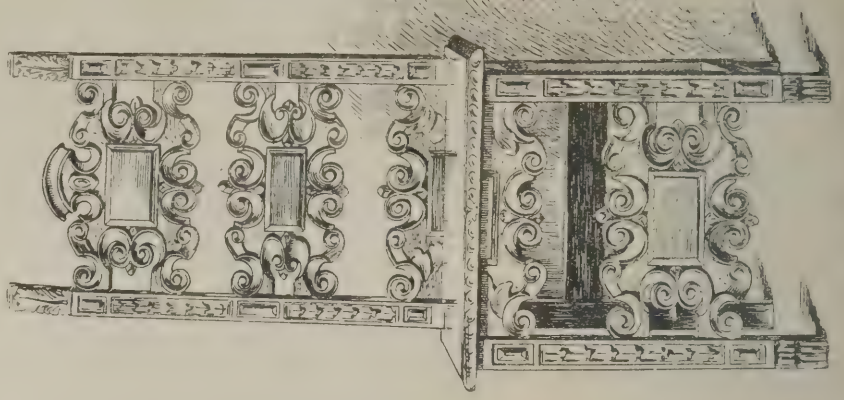
OLD · OAK · FURNITURE

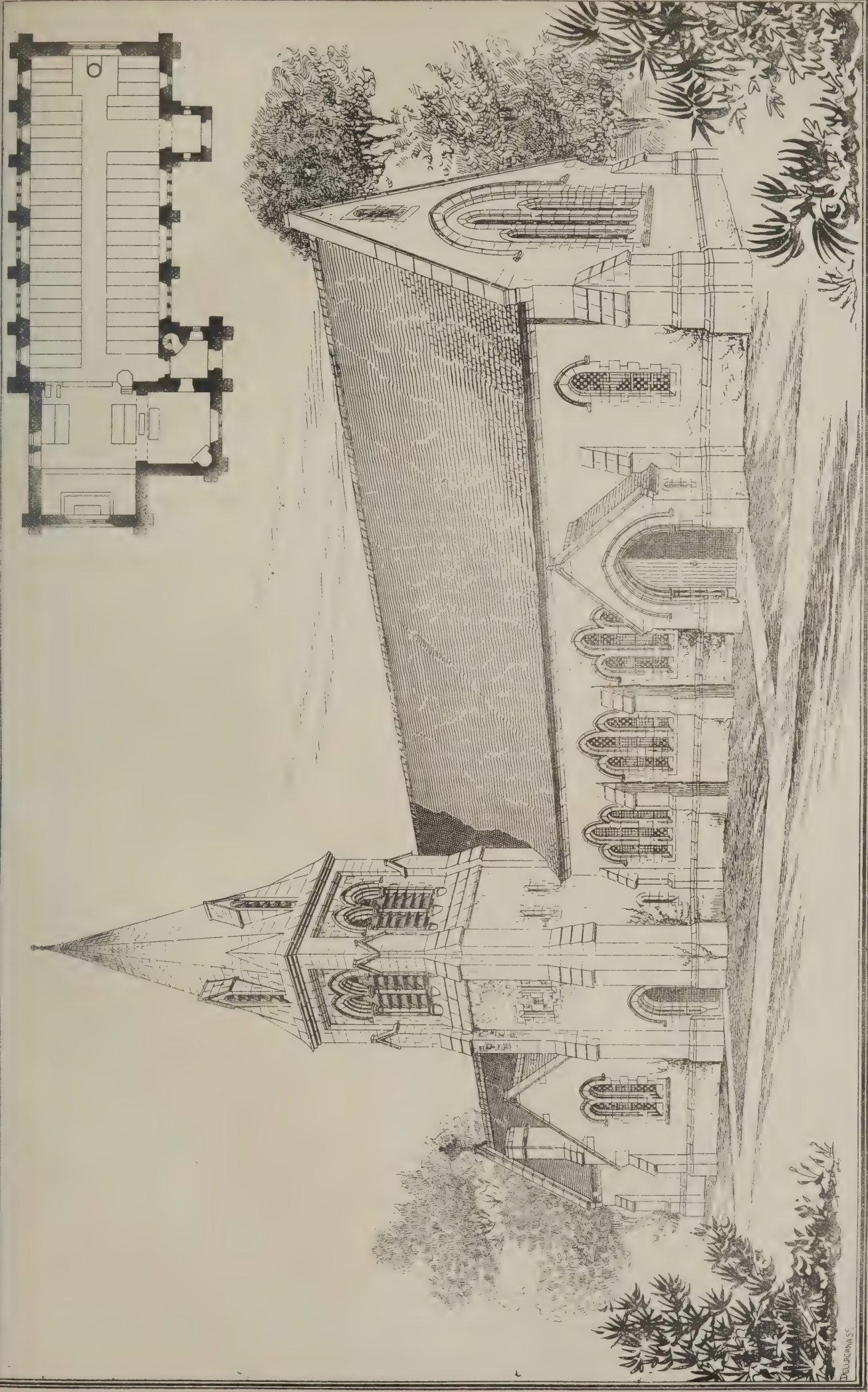
16TH CENTURY BUFFET.
FORMERLY AT CRAIG-Y-NOS · CASTLE



NOW IN THE POSSESSION OF
M^{RS} CHAS · T · RUTHEN ·

TWO · ITALIAN · CHAIRS ·
FROM THE BARGELLO · FLORENCE ·





CHRISTCHURCH HAM HILL KENT
H. PERCY MONCKTON FRIBA ARCHT

WAYSIDE NOTES.

IT may surprise many persons to hear that the Channel Bridge and Railway Company (Limited) continues in existence, and on Tuesday last held its eighth ordinary general meeting. Such business-like procedure and persistence is worthy of a better cause. No one can say that the construction of a bridge across the Straits of Dover is an impossibility; but we can all point out the improbability of the thing. The success of the Forth Bridge has apparently given a certain number of people the idea that one has only to draw out a plan of a deep-sea bridge, and the lapse of a few years will see the work an accomplished fact, wind and weather not entering into the calculation. It does not require great intelligence to see the difference between proposals dealing with firm foundations, ready made, and those relating to none, or, at the least, mere shifting sands beneath a treacherous sea. In works like the Forth Bridge and the Eddystone Lighthouse there have been firm foundations to commence operations upon. The Eddystone Rock in the Channel and the Island of Inchgarvie in the Firth of Forth are substantial facts. So may be the chalk bed of the Straits of Dover, but it is not ready to hand like the other foundations.

However, the company are sanguine enough, and since the names of the big Continental engineers and Sir Benjamin Baker were mentioned by the chairman as being associated with the proposed undertaking, it is not for a mere critic to take a disparaging view of things. According to the chairman's statements, a new route—the result of careful inquiry by eminent engineers—has been chosen, with the advantage of a shorter communication and superior soil, and as a result the number of piers has been reduced from 121 to only 72, the spans being increased in size, and now measuring 400 and 500 metres alternately from end to end. Only seven years, it is said, will be required for the construction of the bridge, four years being for work in the sea itself. The cost is estimated at 800 millions of francs, or 32 millions sterling. The company, like the County Council, have great hopes of a Liberal Government; but if any Government sanctions a bridge across the Channel—presuming that its construction was possible—then Parliament will be a something that has gone from bad to worse. The Straits of Dover are quite full enough of shipping without an assembly of bridge-piers blocking the way.

With the memory of the building at Claybury still green, it is a little startling to hear that the County Council have advertised for a site for a new lunatic asylum to accommodate not less than 1,000 patients. On Jan. 1 last there were no less than 10,508 lunatics for whom the London County Council is primarily responsible to provide accommodation. These figures are as impressive as any in Mr. John Hutton's statement of the annual work of the council.

Statistics of this kind are always surprising in the totals. Thus, one would not imagine that in a single year there would be proceedings taken in 2,658 cases of dangerous structures. All these returns only go to show how vast London is becoming—an overgrown "wen," as Cobbett styled it even in his day. An appalling number of persons of unsound mind, a ridiculously large total of dangerous structures dealt with, &c., &c., are only indications of a constant and rapid growth, the borders of the Metropolis ever extending further and further from Charing Cross as representing the centre of London. On occasions when I chance to go to any district on the immediate outskirts of London that I have not visited for a number of years, I am astonished at the miscellaneous developments, and the greatly increased area covered by bricks and mortar. Not only does London grow from within—in the matter of population—but steadily swells from without, the surplus inhabitants of villages and towns in counties surrounding the Metropolis being added to the native population. Hence we may appreciate the value of the work of the parks and open spaces committee, and all who endeavour to provide more "lungs" to a body that grows so vast in size. Also we can appreciate the value of the river Thames, forming as it does a regular ventilating conduit right through the city.

The statement of amounts expended by the Council during the year is also a matter of big figures. A gross disbursement of £612,000 is made up as follows: Main drainage precipitation works and sludge ships, £170,000; asylums, £153,000; street improvements, £116,000; bridges, tunnel, and ferry, £75,000; parks, £46,000; housing of the working classes, £24,000; fire brigade, £22,000; electric testing, and weights and measures, £6,000. Receipts from Charity Commissioners, local authorities and others towards parks and open spaces, to the extent of £155,000, left a net capital disbursement for the year of £457,000. Here we find drainage, as usual, heading the list of items, and forming a fine handle for those who argue that the London system of sewage disposal is on the wrong system; while the amount laid out on street improvements is comparatively modest.

Dr. C. A. Burghardt's paper on "Sewage and its Purification," duly read on Friday last at the annual meeting of the Incorporated Association of Municipal and County Engineers, at Bury, can scarcely be regarded as satisfactory. Sewage farming and the precipitation processes were condemned alike, but the lecturer ventured no suggestions. To make some practical proposal as to the method of overcoming the difficulties named would have been the least that one would have expected.

Londoners should look to the state of their cisterns and be wary of milk. Dr. Sedgwick Saunders, the Medical Officer of Health to the City Commissioners of Sewers, reports that, though the mortality in the present outbreak of scarlet fever is low, the epidemic—if epidemic it may be called—increases. At the beginning of the month, 2,460 cases were under treatment or isolation. Diphtheria and diarrhoeal ailments are said to be on the increase. Dr. Saunders thinks the figures more significant in that this is only the commencement of the season at which zymotic diseases become more active, and states that the origin of the visitation in France has been drinking of impure water from the Seine. The warning as to water should not go unheeded. If there is to be any cholera this year, householders will do well to commence at once a system of regular and periodically cleansing and examination of cisterns and tanks, and keep it up. If they never give up the practice they will find, or may have faith to believe, that they and their families will be untold gainers in point of health.

One dreads to think of the cistern in the average small London house. If it does not contain the decaying corpses of rats or mice, it will be found to possess a deposit of a most doubtful nature, and probably also a scum on the surface of the water scarcely less inviting. The worst of it is that, even if these householders hear of the necessity for cleansing cisterns and all receptacles for drinking-water, they will generally ignore the warning. The milk question, too, is apt to be misconceived. It is imagined that the milk itself is at fault, whereas it is the passing of milk through infected atmospheres that causes the danger. Milk, it has been satisfactorily ascertained, absorbs fever and other germs as a sponge absorbs water. Thus a glass of milk standing in a room where fever rages will absorb germs or microbes, and becomes a dangerous potion to any person liable to take fevers, &c. While water should be clean, then, milk should be boiled. These facts with regard to milk ought to be made more widely known by local sanitary authorities, especially at a time when so much scarlet fever is about. The danger of dirty water and foul cisterns is more generally appreciated, although unfortunately too often disregarded.

GOTH.

Under the will of the late Mr. Edwin Smallwood, needle-maker, of Redditch, £15,000 is left for the erection of a cottage hospital in that town, and £3,000 for the building of almshouses.

The electric light is being introduced into the colleges as well as in the city of Oxford, under the direction of Mr. J. H. M. Leany, engineer to the Oxford Electric Company. On Tuesday week the inauguration of the new light took place in the dining-hall of Magdalen College. The hall is fitted up with 76 incandescent lamps of 16 candle-power, arranged in groups of four and six lights. The installations at Brasenose and Hertford Colleges will be completed within the next month.

THE RECENT ELECTION OF THE A.A. COMMITTEE.

A STORM IN A TEACUP.

IT will be fresh in the recollection of all readers interested in the welfare and progress of the Architectural Association that at the closing meeting of that body, held on the 27th May, a long and animated discussion took place as to the propriety or otherwise of the action of the committee in striking the name of Mr. Gerald Horsley off the list of candidates on the voting-papers after they had been issued to members, on the ground that Mr. Horsley had resigned his membership in November last, and was, therefore, ineligible. Mr. Leonard Stokes contended at that meeting that the resignation was immediately withdrawn, but as no record of the withdrawal and reinstatement of Mr. Horsley's name appeared in the minutes, the meeting supported the action of the committee. A fresh surprise was revealed on the presentation of the scrutineers' report, for it proved that if the votes for Mr. Horsley had been counted, he would not have been among the successful candidates. Those who were dissatisfied with the turn taken by the proceedings, decided to take steps to test the opinion of the members as to whether the whole election should not be declared null and void, and a fresh vote taken. They held that had the name been omitted from the original voting list, the votes given to that member, and now declared to have been lost, would have been distributed among the other candidates, thereby affecting the composition of the committee. A requisition signed by fifteen members was therefore forwarded to the secretaries, and in accordance therewith a special meeting was convened in the long gallery at 9, Conduit-street, W., on Friday evening last. Most of the "front-bench" members—those who take the leading part in all discussions—were present, and the proceedings were very lively. The new President, Mr. H. O. Cresswell, was unanimously voted to the chair. Mr. Gale, secretary, read the requisition convening the meeting, and also By-laws 43 and 44. He added that counsel's opinion had been taken as to whether the committee were within their rights in striking out the name of a candidate who had withdrawn from membership, and as to whether the election was thereby invalidated. He read the statement of the case, drawn up and submitted, and counsel's reply, which supported the action of the committee. Mr. C. H. Brodie, who was frequently interrupted, moved a series of resolutions, stating that "the declared result of the voting was most unsatisfactory and misleading, if not actually invalid," and directing the secretaries to issue fresh voting papers and conduct the election anew. A long discussion followed, in which Messrs. Cole A. Adams, E. Woodthorpe, Sydney R. Beale, Greenaway, and others took part. The full report of the scrutineers at the recent election was called for and read. Mr. Greenaway asked that the papers should be analysed, so as to show how many gave less than the full number of votes; but it was pointed out that it would be impossible to tell from this how the votes would have been cast had Mr. Horsley not been a candidate, and the request was eventually withdrawn. The following amendment was proposed: "That the committee having declared that one of the names placed on the voting lists recently issued was improperly so placed, this meeting is of opinion that it was properly so placed, he being a member at the time." This amendment was freely discussed, Messrs. H. D. Searles-Wood, E. Woodthorpe, W. J. Borrowghes, Leonard Stokes, Cole A. Adams, F. T. W. Goldsmith, E. S. Gale, S. B. Beale, Greenaway, and C. H. Brodie being among those who assisted in the proceedings. On a vote being taken, the amendment was carried by a large majority, and Mr. Beale's resolution lost. A hearty vote of thanks to the President closed the animated proceedings, the result of which, it will be seen, was to reinstate Mr. Horsley's name in the list of members, and to declare that the election of May 27th was a perfectly valid one, the officers and committee having been duly and properly elected.

At the Dublin police-court on Friday, John Ryan, Broombridge House, Cabra, was fined £5 for having permitted his new house, 105, Phibsborough-road, to be occupied without obtaining the written certificate of its fitness to be occupied from the city surveyor. Mr. Walter Butler, assistant-surveyor, proved the case.

CARPENTRY AND JOINERY.—XLV.

WAINSCOTING.

WAINSCOTING is the framing or boarding which occurs above the line of skirting, reaching to the height of from 3ft. 6in. to 4ft. 6in. usually, sometimes extending even higher than this. Wainscoting is to be found in the halls and kitchens of ordinary dwellings, in the form of sheeting, and in this form it may also be met with in schools and other public buildings. In better class dwellings, instead of being simply sheeting (tongued and grooved), it takes the form of framing, more or less elaborate.

In the shape of framing, it is also found in banking rooms, and the public rooms of insurance offices. As has been stated, its simplest form is sheeting. Take the case of an ordinary dwelling: it would be well if the stairs were in their place prior to strapping for the wainscoting.

With a height of 3ft. 9in. or 4ft., which would be the ordinary height, three straps would be required in the height; one say about 6in. to its top edge, the upper one having its top edge just at the height of the wainscoting, so as to serve for nailing the capping to, and of course the third one would be in the middle of these two. These straps would be fastened in some of the ordinary ways, such as by plugging the walls; or sometimes, in the case of brick-work, double hoop-iron is put in the joints where it is required, between the two folds of which the nails are driven, and these being driven through the straps previously hold them firmly. However, in many districts of the country the plugging is the universal custom. The straps should be put up to a line or straight-edge, and should be plumb to each other, unless special

to the length before putting them in their place. It may also be necessary to refrain from nailing several pieces at the end, so as to spring them in. Internal angles are readily got over, as the piece which begins to form the angle (right, acute, or

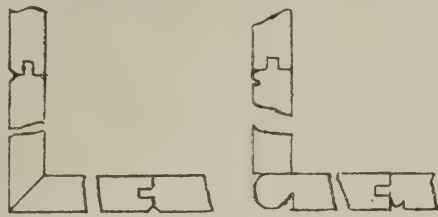


Fig. 298.

obtuse) is simply planed to fit the angle and butted against it. External angles must be either mitred, or arranged with a return head, according to the need of the case.

Fig. 298 gives two examples of finishing at the angles, one being, as is seen, that of a V or channel-jointed sheeting, and the other being that of a beaded sheeting; both drawings should

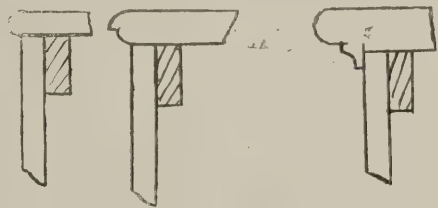


Fig. 299.

be self-explanatory, as they are simple, and such as to suit the case under consideration.

Sometimes two beads instead of one may be wrought upon the sheeting, as nowadays we have a profusion of beads introduced into many classes of work. To finish this wainscoting the only

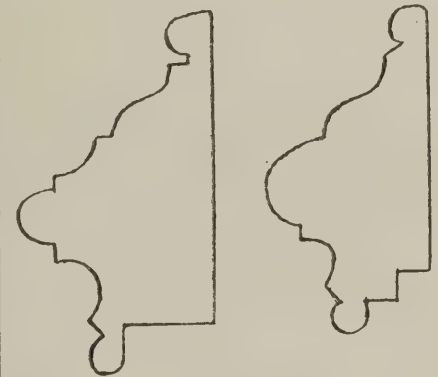


Fig. 300.

additional feature required is a capping, which may be of a very simple kind.

Fig. 299 gives three of the more usual kinds of capping. The middle one is to be found in churches, or its place may be supplied by some other Gothic moulding or other moulding to suit

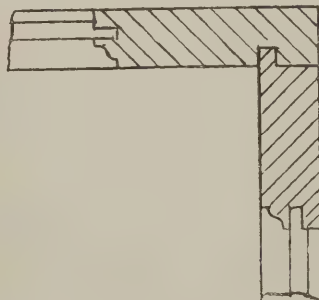


Fig. 301.

the peculiar style of architecture adopted. The capping is nailed through from the outside, being nailed into the sheeting and strap either simultaneously or alternately.

When a skirting occurs, then no scribing to the floor is done; the wainscoting may even be several inches short of the floor, reaching down so far as that the skirting will well cover it. What has been stated up to now may be spoken of as the basis of all further kinds of wainscoting. It will be readily understood when mentioned that in order to use sheeting for wainscoting in any other way than simply placing it perpendicularly or diagonally, it will be necessary to prepare by a great amount of grounding, or extra strapping—or, simpler still, by rough boarding in a similar way to counter flooring, which is, of course, used as a groundwork for a more elaborate flooring, so this rough sheeting of walls may serve as a groundwork for fancy sheeting of a vast variety of patterns, such as herring-bone and many kinds of diaper patterns.

This hint of counter sheeting opens up a way for an almost infinite variety of designs in a wainscoting composed of sheeting of the tongued and grooved class. We may pass on to other kinds of wainscoting, and these will be made up of framing. The first thing to settle will be its height, which will usually be determined by its situation. Halls have a moderately high wainscoting. State apartments of recent years have rather a low wainscoting. In one notable case coming under the writer's notice, the wainscoting in these rooms was only the height that a surbase would have been if such had been used. The decorator's treatment of the walls in regard to colour may sometimes fix the height of the wainscoting. However, the height is usually a matter strictly within the province of the architect, and the workman is only allowed a voice in some of the minor details. If the wainscoting is a low one, then there will probably be only one panel in the height; and as skirtings have

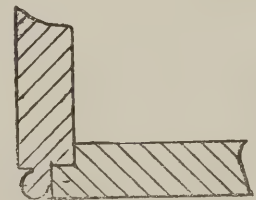


Fig. 302.

been pretty fully detailed, it only needs to be said that a suitable skirting will be adopted, and that the bottom rail of framing is usually a little wider than the top one. The panels are seldom, if ever, more than 10in. wide. The next point is the capping, which, in cases of this kind, is usually a little elaborate.

Fig. 300 gives two examples of capping suitable for wainscoting of the class being dealt with. They are given half-size. The drawings, it is hoped, are self-explanatory, and the thickness of wainscoting will be seen, and also how the joint between the capping and the wainscoting is covered by the bead extending over the front of the wainscoting. The capping is spiked against the strap, which is carried along at the proper height to receive the capping and top-rail of the wainscoting. It will be obvious from this that the strapping must be put up before the plastering is finished, or, for that matter, begun. Another strap may be carried along to fasten the bottom rail to, and also to serve for fixing any grounding to which is required for the skirting. The wainscoting may be either moulded on the solid, or the moulding may be planted in. When of oak the moulding is usually solid, but with any soft wood the *planting* is resorted to. The outline of a room is usually taken after the room is plastered, and all dimensions figured on the sketch-plan prepared for the purpose, and very often each piece of framing is set out separately on a lath or rod.

The method of joining at the angles requires a little attention. Internal angles are put together as shown in Fig. 301.

This is a very simple arrangement. As will be seen, one stile requires to be sufficiently broad to allow for the thickness of a return piece of framing going against it, and the stile on the other piece of framing requires to be the *tongue* wider.

Fig. 302 gives a sketch of how the external angles may be treated; the bead may be of any size, according to taste or design; or an *ovolo*

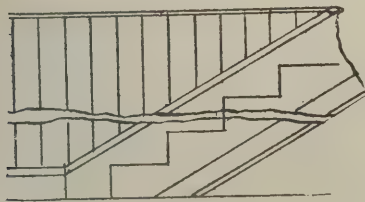


Fig. 297.

circumstances render it necessary to be otherwise.

The three straps being plumb to each other, will thus fill a straight-edge if it is placed against them. It would be just as well to have the architraves in their position before the straps are put up, as it will be necessary to preserve the margins down along the architraves. In the event of wainscoting extending to the stairs, the straps will require to reach forward also, and it will be necessary to have one running parallel to the string or notchboard, so as to receive the bottom ends of sheeting, and in order to nail it to. It will be understood that the sheeting will thus run up along the string-board and form a triangle.

Fig. 297 gives a skeleton outline to show this triangular joint of sheeting, where it runs up and terminates on the string.

The bottom horizontal line is that of the floor, and the top line is that of the height of the sheeting. The difficulty which would be most likely to occur in this case would be that of the wainscoting being too full for the string-board, but if it could be understood before then this should be provided for. If there is to be no skirting, then the sheeting should be scribed to the floor, each piece as it is put up. The usual way is to cut the first or starting-piece to the height after it has been scribed to the floor, and then scribe the others and nail them; the first piece should also be put up plumb edge-wise. The cutting along the top is done after it is all up, or if the distance is too great after a considerable quantity has been put up a line is drawn along, and the cutting is done by means of a panel saw, or sometimes even with a tenon saw. This cutting is a little awkward, seeing that the blade of the saw has to be held horizontal, but one soon gets used to it. As has been said, the top strap is put up, so that the top of the wainscoting will just come level with it, which makes the cutting much easier. At the termination of a side it is usual to cut the piece, or it may be necessary to cut two or three pieces

may be substituted instead, both of these being stopped if required, which will be necessary if particularly neat work is required at the capping and skirting. The capping and skirting will be mitred at the external angles, and, of course, scribed at the internal ones. A. C. SKILLING.

ST. SEPULCHRE'S CHURCH, HOLBORN VIADUCT.

THE church of St. Sepulchre, Holborn Viaduct, has been undergoing general repairs since November last, being confined principally to the exterior.

The walls to the north, south, and east of the church have had their lower portions covered with earth upon the outside to the height of 4 or 5 feet above the level of the floor inside. Owing to the continual raising of the ground by burials, extending over many long years since, this had rendered the walls in many places very damp. Open areas have now been formed between each of the buttresses, 3ft. wide and 1ft. below the level of inside floor, having retaining walls built up with brickwork in cement, the whole coped with stone. They are covered in with open iron ornamental castings laid flat, so that garden-seats may be placed upon them safely where thought desirable, thus utilising the whole of the churchyard, it having been again well laid out by the churchwardens with shrubs and flowers, in the interest of the parishioners and others who may like to take advantage of it.

During the progress of the works, and upon removing the ground, laying exposed the face of the south wall near the east corner, was brought to light an interesting portion of what may be considered the remains of an ancient crypt or underground chapel, having a small doorway and two-light window adjoining, the door forming an entrance to the crypt beneath the floor of south aisle, with window lighting the same at its side; they were both of them bricked up from the inside, no remains of the door being found but the hooks let into the jambs. The window had small slightly pointed openings, all the glass was gone; but the iron stanchion and saddle bars were *in situ*, and in good condition. There had also been a small window at the east wall of this crypt. The whole of the beforementioned being below the general level of the churchyard, was entirely hidden from view.

In an engraving of this church published in 1737, there is shown, situate at the east end of the south aisle, a retaining wall inclosing a portion of the church and churchyard at this corner, with an ornamental wrought-iron entrance-gateway at the east end, leading down by steps inside from Giltspur-street to this underground crypt or chapel; a portion of steps to it were found during the excavations. Portions of a stone-coped altar tomb were also met with, having carved mouldings at edges of same, the top being formed with raised foliated cross, having three small steppings at base of same, and small leaves at sides of stem; the whole had been terribly mutilated. This portion has been inserted in the upper part of the doorway for inspection, together with the small windows, showing the ironwork as originally executed. These are not now easily seen owing to a large stone landing being laid above and in front of them, forming the entrance to church at the east end of the south aisle. When digging for new drain at the east side of porch the remains of several stone steps, some 5ft. beneath the surface of the churchyard, were also discovered, and a small doorway leading to a crypt, beneath the floor of porch, so that a portion of the vaulting was to be seen, showing that there exists a vaulted chamber beneath entrance porch; but it is now inaccessible, being again filled up by the general raised level of the churchyard.

New stoneware-pipe drains have been laid to take the water from the roofs and inside of areas, with inspection chambers, siphon traps, and ventilation pipes, &c., throughout. The buttresses to the south side, between the windows, have been somewhat enlarged, and old stonework reinstated, as also the parapets and other portions of the exterior, having been executed in Portland stone. There has been a new roof, covered with lead, formed over St. Stephen's Chapel, situate on the north side of north aisle, constructed of oak, with moulded ribs and boarded ceiling (the whole being raised some 10ft. in height, has allowed the organ also to be raised several feet from the floor), which,

together with the form of the same, and the opening-up of the two groined arches of the aisle immediately adjoining, tend greatly to develop the sound and tone of the organ, and with its many new stops and enlarged pipes, has made it one of the finest and most effective instruments among the City churches. The whole of the walls and ceilings of the interior have been painted in silicate in several colours throughout.

The tower also has been restored by having the decayed portions of the stonework made good in Kentish rag, and where old lines of string-courses before existed an endeavour has been made to show the several original divisions or stages of the tower.

The whole of these repairs have been ably carried out by Messrs. Lidstone and Son, builders, under the direction of Messrs. Arthur and A. E. Billing, F.F.R.I.B.A., for the vicar and churchwardens.

OBITUARY.

WE regret to announce the death of Mr. Henry George Austin, F.R.I.B.A., which occurred on Sunday at his residence in the cathedral precincts, Canterbury, in the 69th year of his age. The care of the fabric of the cathedral was in the hands of the late Mr. H. G. Austin and his father, Mr. G. Austin, for about 80 years. In 1848 Mr. Austin succeeded his father as architect and surveyor to the Dean and Chapter, and he held the position until his retirement some three years since. Under his supervision many extensive alterations were carried out. Sixteen or seventeen years ago he restored the roof of the nave and refaced the clock tower, in the niches of which new figures were placed. The present library was also built by him upon the site of the old dormitories. Mr. Austin also took a prominent part in the public affairs of Canterbury, both social and political. About three years since Mr. Austin resigned his appointment under the Dean and Chapter, and retired into private life. In May, 1891, he was prostrated with an attack of influenza, from which he never entirely recovered. He was one of the senior Fellows of the Royal Institute of British Architects, having joined as a life member in 1851, and some years since served as a member of Council.

Mr. Robert Bruce, one of the most energetic labour representatives at the Dundee Town Council, died, after a severe illness, in the Epidemic Hospital, Dundee, on Friday morning. Deceased, who is survived by a widow and family, was a joiner by trade, and represented that body at the Trades Council, of which he had been president for several years. Prior to the last sitting of the Trades Union Congress in Dundee he was nominated for the office of secretary—a position to which he was eventually elected. In 1890 he and Mr. R. D. B. Ritchie, his successor as secretary to the Trades Council, were returned to the Town Council as labour representatives, the Trades Council guaranteeing them funds for their support. In the following year he secured seats at the school and parochial boards and the gas commission. In the spring of last year he contracted typhoid fever while making a tour of the slums, and inflammation of the lungs supervening, caused death, after many months' suffering in the hospital.

The Great Eastern Railway Company are about to spend £30,000 upon a new station on the main line at Colchester. The work will be begun in the autumn.

On Friday last a new national school was opened at Barnard Castle. The new buildings are near the church, and are built in two wings, at right-angles. The main school is 150ft. by 20ft., and is divided by three patent glass sliding partitions. There are four class-rooms, each 27ft. by 22ft. The school gives accommodation for 250 boys and 250 girls. The total cost was £4,600.

The Southampton Free Library committee reported last week that they had received twelve applications for the office of clerk of the works for the new library buildings, and of these they recommended the committee to select from Messrs. W. Bennett, W. N. Masters, and H. W. Willis. Bennett was residing at Liverpool, and had acted as clerk of the works during the erection of the Liverpool Exhibition; Masters was a Southampton man, residing at present at Fulham; while Willis was also a Southampton man. The two latter were interviewed and questioned, after which Mr. Willis was elected.

COMPETITIONS.

BRINTON PUBLIC BATHS.—Mr. A. Hessel Tiltman's design for the above new baths has been, on the recommendation of the Commissioners' arbitrator, Mr. Henry Currey, awarded the first premium. This is the fourth competition in two years in which Mr. Tiltman has met and beaten all comers, and on one of these occasions, as our readers may remember, he obtained the second as well as the first premium.

MANCHESTER ROYAL INFIRMARY.—At a meeting of the trustees of the Royal Infirmary, held at Manchester on Wednesday, the report of a sub-committee as to the limited competition for the extension of the building was adopted, and Mr. Alexander Graham, F.S.A., of Carlton-chambers, Regent-street, S.W., the author of the selected plans, was appointed architect. The sub-committee stated that the three sets of plans submitted for competition had received careful scrutiny, with the view to determine their several merits, their relative adaptability for furthering the best interests of the institution, their general features in respect of harmonising with existing surroundings, and in their entirety as tending to form an additional ornament to the city. The prescribed requirements had been complied with by each competing architect. Different methods, however, having been followed in working out details, the committee had had to give careful consideration to each plan with regard to its suitability to the uses intended. Two of the three competing architects had selected the Piccadilly frontage as the one best adapted for carrying out an extension. In this conclusion the sub-committee fully concurred. The sub-committee had further determined that, if the requisite extension could be effected by a three-storied elevation, such would be preferable to the addition of a fourth story. They were of opinion that each new ward should be built on the pavilion principle, and that any scheme calculated to provide four rows of beds in a ward, divided by an intervening screen, would be open to sanitary and other objections which do not apply to wards constructed on the recognised method of placing two rows of beds opposite one another against the outer walls. The sub-committee had carefully weighed the respective advantages of adopting circular walls as against longitudinal walls, and, without attempting to dogmatise on the question, they had concluded that the construction of circular towers would be so much out of harmony with the present building as to make their adoption an incongruity. The sub-committee recommended the plans—subject to minor changes in detail—of Mr. Alexander Graham, which, in their judgment, offered the largest advantages architecturally, with the fewest countervailing drawbacks. In the matter of cost, Mr. Graham submitted the following estimates: (1) Two new wings, new operating theatre, and alterations of the main buildings, £34,000; (2) extension of the nurses' home, including sanitary fittings, £5,020; (3) extension of out-patients' department and alterations thereto, £1,700—total, £40,720. If the suggestions of the committee were carried out, the increased area built upon would represent less than one-third of an acre, and the whole space then covered will be less than $1\frac{1}{2}$ acres, leaving about $3\frac{1}{2}$ acres still uncovered.

STAFFORD.—The County Council of Staffordshire, at their meeting on Tuesday, adopted the recommendation of Mr. J. MacVicar Anderson, P.R.I.B.A., the assessor in the competition for the proposed county council buildings, as already announced—viz.: 1st, £150 premium, H. T. Hare, 15, Queen-street, Cheapside, E.C.; 2nd, £100, Messrs. Treadwell and Martin, 2, Waterloo-place, Pall Mall, S.W.; and 3rd, £50, Messrs. Cooksey and Cox, 17, Buckingham-street, Charing Cross, W.C. Mr. Hare was appointed as architect, and it was decided to exhibit all the designs sent in, sixty-three in number, at the Shire Hall at Stafford.

A new clock and St. Mary's of Cambridge chimes has been added to the parish church, Giggleswick, by the masters and scholars, past and present, of the famous Giggleswick schools. Messrs. Potts and Sons, clock manufacturers of Guildford-street and Cookridge-street, Leeds, were intrusted with the order, and the new clock shows the time on one external copper dial, which is painted and gilt, 6ft. diameter, facing eastwards, the hours and St. Mary's of Cambridge chimes being struck upon the peal of six bells in the tower.

Building Intelligence.

BRADFORD.—The foundation-stone of the Central Hall for the Primitive Methodists was laid on Saturday. Its erection will entail an expenditure of £4,700. The architects are Messrs. H. and E. Marten. On the ground floor are to be two large shops, one on either side of the vestibule and entrance-hall, which will give access to the hall and existing schools, built in 1880. On the first floor will be the central hall, a room 55ft. square. Galleries are to occupy three sides, and altogether there will be accommodation for about a thousand people. The galleries will be supported on cantilevers, bolted into the outside walls. The basement is also to be let for business purposes. The contractors are—mason's work, Messrs. Humphrey and Moulson; joinery, &c., Mr. James Deacon; plumbing, Mr. G. Jackson; slating, Mr. A. Hill; plastering, Messrs. B. Dixon and Co.; ironwork, Messrs. Homan and Rodgers.

ISLINGTON, N.—The Lady Mayoress formally opened on Tuesday the second of the public baths erected for Islington. The baths stand upon a site of 2½ acres in the Hornsey-road, and include separate swimming-baths for men and women, private baths for men and women, washing and drying compartments, an establishment laundry, and the necessary steam machinery, the premises being lighted by electricity. The cost of the site was £6,000, and of buildings and machinery and electric lighting £32,000. The architect was Mr. A. H. Tiltman, whose designs were selected in competition, and the builders were Macfarlane and Co. We illustrated Mr. Tiltman's selected designs in our issue of Dec. 25, 1891.

LLANMEREWIG.—The parish church of this village was reopened on July 17th. The restoration plans were prepared by Mr. Aston Webb; but as Mr. Aston Webb was unable, by press of business, to continue to carry out the original design, it was intrusted to Mr. W. H. Spaul, of Oswestry, who, with the contractor, Mr. Aaron Watkin, of Welshpool, has successfully carried it to completion. An east window has been introduced, the tracery being a close reproduction of that of the old one.

MARKET DRAYTON.—On the 21st inst. a new cottage hospital was opened at Market Drayton. The building, which is chiefly on the ground floor, consists of a main corridor with male and female wards for four beds each with isolated lavatories, nurses' and committee rooms and garden entrance on one side, kitchen and usual offices, surgery, dispensary, and waiting-rooms, and two nurses' bedrooms on first floor. The elevations have been designed in a cottage style, and are carried out in Gnosall red bricks with Northwich red brick dressings, and with large half-timbered gables and dormers. Special ventilation has been provided by Shorland's inlet and exhaust ventilators, and Shorland's Manchester stoves have been used in the wards. The total cost has been about £2,000. The work has been carried out by Mr. John Gullimore from the designs, and under the superintendence of, Mr. John Lewis, architect, of Newcastle, Staff.

MEVAGISSEY.—The Wesleyan chapel erected here about fifty years ago has undergone complete renovation. The plain exterior has been embellished by stringcourses with pilasters in cement. Inside an orchestra has been built behind the rostrum to receive organ and choir. The whole of the chapel has been re-plastered, re-seated in pitch-pine, and an enlarged lobby erected. The plans were by Mr. James Hicks, architect, of Redruth, and the whole of the work has been carried out by Mr. Arthur Carkeek, of Redruth. The contracts are for £830, which, with the expenses of lighting, warming, and other matters, will bring the total amount to about £1,000.

The ruins of the castle at Znaim, in Moravia, a hundred feet high, fell down on Monday morning, and in their collapse two houses and a brewery were buried under the debris. Four persons were fatally crushed.

St. Mary's Roman Catholic Cathedral, New-castle-on-Tyne, which has been closed for the last few weeks, was reopened on Sunday. The handsome interior of the fine edifice has been redecorated throughout, and the electric light is now installed in place of gas.

Engineering Notes.

DERBY.—The rearrangement of the façade of the Midland Station at Derby will ere long be practically complete. Progress is also being made with the new Midland Institute opposite the station. The large new annexe to the engineers' offices is almost ready for occupation, and the duplication of the bridge at the north end of the station is being pushed forward with all despatch. The old bridge was designed by George Stephenson, and was built by the grandfather of Mr. J. D. Nowell, the contractor for the present widening.

THE MUNICIPAL ENGINEERS' ASSOCIATION AT BURY, LANCS.—The Conference of Municipal and County Surveyors at Bury was continued on Saturday. A paper on "The Utilisation of Water Power," by Mr. Herbert J. Koates, of Market Harborough, was considered. The author dealt principally with the use of water for driving electro-motors. He cited the case of Carlow, where the Municipal authorities quarrelled with the gas company, and determined to discontinue gas-lighting, and start electric-lighting. Carlow being situated at the junction of the Rivers Barron and Burren, plenty of water was available. A disused corn mill, five miles from the town, was converted into a dynamo room, the old water-wheel of the mill doing the necessary work. The wires conveying the current are carried overhead on poles to the town. The members afterwards visited the stone quarries of Sir Thomas Brooks in the Rossendale Valley. Mr. H. Bolton, of Owens College, Manchester, delivered an address on the geological features of the district. He pointed out that the millstone grit series reached their maximum development in Lancashire. Afterwards the company drove to Clough Bottom, in the water valley, where the Bury Corporation are constructing a new reservoir. The members of the Association lunched with the Corporation, the Mayor presiding. At the close Mr. James Lemon, F.R.I.B.A., the Mayor of Southampton, proposed a vote of thanks to the Corporation of Bury for the hospitality shown to the Association. Mr. Dyack, of Aberdeen, seconded the motion, which was heartily carried. This concluded the meeting.

Mrs. Burne Jones makes an appeal on behalf of the South London Art Gallery, in Peckham-road, for a loan of pictures during the months of August and September, and adds: "A most generous gift has lately been made to the institution for the purpose of building a lecture-hall and library in connection with the picture gallery, and many books have been already promised for it, but others will be wanted."

The Parisians have decided to clear the ruins of St. Cloud, associated with the memories of Henri Quatre and Bonaparte, and to convert the site, as has already been done with the remains of the Tuileries, into a garden. The ruins were sold by auction on Monday, and were secured by M. Kessel, a Parisian builder, for £133 sterling—a miserably low figure when it is remembered how many "relics" can be manufactured from the fragments.

Messrs. John Morris and Son, architects and surveyors, of Bolton, have been appointed by the assessment committee of the Stockport Union to make a valuation of the following works in the union: Cotton factories, hat works, bleach and print works, foundries, machine and engineering shops, sawmills, timber, slate, and flag yards, linoleum works, wool factories, paper works, corn-mills, warehouses, small workshops, bobbin works, &c. The union comprises 17 townships, and the rateable value is £571,011.

At the Edinburgh Dean of Guild Court last week a warrant was granted to the trustees of the Merchiston United Presbyterian Church to erect a new church at Polwarth Gardens. The building will be in the Late Gothic style, and the plans show a handsome frontage and a well-proportioned spire, rising to a height of 120ft. Accommodation is provided for 600 in the area, and for 265 in the gallery. Mr. David Robertson, Maitland-street, Edinburgh, is the architect.

On Saturday afternoon the Duchess of Teck performed the ceremony of laying the corner-stone of the new church of the Good Shepherd, Mansfield-road, Gospel Oak, N.W. The new church is to take the place of a temporary building close by. Only the nave is to be built at present, at a cost of £8,000, of which about £4,000 has been given or promised. Messrs. James Brooks and Son are the architects, and the church was illustrated in our issue of the 17th ult.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

ARCHITECTURAL ASSOCIATION EXCURSION, 1892.—Taunton will this year make the headquarters of the excursion party of the Architectural Association, from August 15th to 20th, and the places finally settled to visit are as follows:—Bridgewater; Cannington Manor; Guernsey-street Farm; Blackmore Farm; Spaxton Manor house and farm; East Quantock Head Hall; Nettlecombe; Combe Sydenham; Minehead church; Dunster castle; Cleve Abbey; St. Decumen's church; Trull, Poundisford Park; Ruishton church; Creech St. Michael and Kingston-St. Mary; Cothelstone Manor house and gateway; Bishop's Lydeard church and Bishop's Hull. The secretary of the excursion who has the details of the programme in hand is Mr. H. D. Searles-Wood, F.R.I.B.A., who for many years has arranged these enjoyable outings.

LEICESTER MASTER BUILDERS' ASSOCIATION.—The annual dinner in connection with this Association took place on Thursday night, July 21st, at the Bull's Head Hotel. The chair was occupied by Mr. D. Garrett, the president, and the vice-chair by Mr. E. B. Pipes. Mr. Hardington proposed "The Leicester and Leicestershire Society of Architects," coupled with the name of Mr. A. H. Paget, the president of the Leicester and Leicestershire Society of Architects, who responded. Mr. S. P. Pick, secretary of the Society, proposed the toast of "The Leicester Master Builders' Association." He referred to a circular-letter which had been sent to the architects with regard to builders tendering from specification and drawing only. It was not possible for builders to give a legitimate price from these alone, and unless something more definite was placed before them they could not do justice to themselves, the architects, or their clients. Mr. Garrett, in responding as president of the Association, said that they had had some correspondence with respect to the conditions of contract. Seeing that the matter was now being considered by the National Association of Master Builders and the Royal Institute of British Architects they could well afford to wait and see what they proposed before the local association attempted to adopt anything for themselves. The toast of "The Town and Trade of Leicester" was also drunk, proposed by Mr. E. B. Pipes.

CHIPS.

The vestry of St. Mary, Islington, held a special meeting on the 22nd July to consider a report from Professor Henry Robinson with reference to the electric lighting of their district, and it was unanimously resolved to apply for a provisional order under the Electric Lighting Acts.

New national schools were opened at Marston last week. The architect was Mr. M. K. Ellerton, of High-street, Northwich. Mr. T. Leicester, builder, of Northwich, was awarded the contract, the amount of which was £1,310. The total expenditure will, however, reach about £1,660.

The King's Bridge at Eye, Suffolk, built in 1705, is now being reconstructed for the town council and West Suffolk County Council. Messrs. W. and F. Rampling are the contractors.

Arrangements have at length been made for laying the foundations for the monument to the memory of the late Earl of Shaftesbury on the site granted by the London County Council at Piccadilly-circus, immediately facing Shaftesbury-avenue. The monument, as is well known, will take the form of a fountain, the work of Mr. Alfred Gilbert, A.R.A. It will be octagonal in form, and in bronze, and will be about 36ft. in height from the ground line.

The Master of the Mercers' Company visited Horsham on Monday and laid the foundation-stone of a new grammar school, which is to be erected in that town. The school was founded in 1540 by Richard Collier, a wealthy London mercer. It is now intended to enlarge the scope of its work.

On Saturday afternoon four corner-stones of a new chapel and schools for the Wesleyan Methodists of Berry Brow, near Huddersfield, were laid. The chapel is to accommodate 450 persons, and the school 400 scholars, and the estimated cost is £3,500. The style adopted is the English Renaissance, and the buildings are being erected from designs of Mr. Lockwood, Huddersfield.

The thirty-fifth annual meeting of the Kent Archaeological Society was held at Dover on Tuesday and Wednesday week, under the presidency of Earl Stanhope. Visits were paid to St. Mary's Church, St. Martin's Priory, the Castle, the Museum, and Temple Ewell and Alkan Churches.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C. and not to members of the staff by name. Delay is not infrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL., XLII., XLVI., XLIX., L., LI., LIV., LVIII., LIX., and LX. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

J. H. THOMAS. (Write the Secretary of the Institution of Surveyors, 12, Great George-street. It is by far the most alive of the professional societies, and in every way a credit to belong to it, and its secretary is always courteous and painstaking in giving information to all.)

RECEIVED.—B. R. G.—J. M. and Y. R. Co.—T. M. L.—Gov. Inspector.—F. G. W. Co.—Oxonian.

Intercommunication.

QUESTIONS.

[18819].—**Gas Regulator.**—Can any of your readers tell me which is considered to be the best regulator for fixing on gas meters (for a large number of lights supplied through a 2in. main)?—F. J. BARNES.

[18820].—**Adjoining Premises.**—Will any of your numerous readers kindly inform me what is best to do in the following case? I am building an addition to a house. The side wall is the boundary wall, and the owner of the adjoining premises has recently built an addition to his house, and the side wall is built within 5in. to the boundary wall, and he has not fixed landers along the eaves, and the rain comes down on the new wall, and if he refuses to put up landers the side wall of my building will always be damp. The other building is much larger and loftier than mine. I have no objection for him to bring his ladders on my grounds for him to do the work. I wish to know, can I compel him to put up landers, &c., or what is best to be done in this case?—W. W.

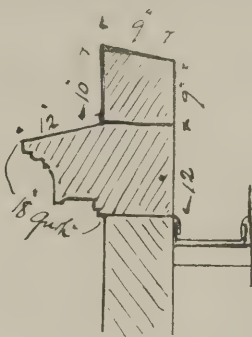
[18821].—**Cemetery.**—Is there any work published on the laying out of a cemetery, and the general duties of the surveyor to a burial board?—NECRO.

[18822].—**Copying by Reflection.**—Sometime ago the idea occurred to me of copying architectural or other large drawings (or even prints or printed matter) by means of simple reflection—viz.: If a highly-polished narrow speculum (or even a piece of polished glass) be placed in close contact with a drawing in the sunlight, the lines of that portion of the drawing coming closest in contact with the speculum will be thrown off again with more or less definition, according to the circumstances. Now my idea is to utilise this fact, and to employ sensitized paper to obtain positive copies of any drawing in good clear lines, and without injury to the same. The method I propose to employ is to fix up two narrow rollers, somewhat after the fashion of a miniature mangle, with spring and toothed-wheel arrangement for revolving the said rollers uniformly, and at varying speed, according to the desired period of exposure to the light. One roller would contain the drawing, and the other the sensitized paper, both of

which would be so arranged that the speculum (a mere bar extending the length of the drawing, &c.) could receive the lines of the drawing as they passed under or above its edge, and reflect them again on to the sensitized paper, while it, too, was momentarily exposed to the influence of the speculum. The difficulty is the arrangement. Can any of "ours" suggest a good arrangement?—COLOUR BRUSH.

REPLIES.

[18807].—**Measuring Stone Cornice.**—I send



sketch and the proper method of measuring. Length of cornice, &c., 10ft. :-

ft.	in.	
10	0	
1	0	
10	0	Plain face to cornice.
1	0	
10	0	" " weathering.
1	6	
15	0	Moulded face.
10	0	
10	0	
8	4	Plain face blocking.
7	6	" " "
10	0	
7	6	Plain weathering.

Dowels, cramps, sunk and cement grouted joints, each, joint (between two stones) extra. If wall below cornice is of stone, add extra for grooving for flashing 10ft. run.—THOS OLLERENSHAW.

Legal.

INTERESTED ARBITRATORS.

IN one sense, it very often happens that an arbitrator upon a building contract, and who is also the architect or engineer, is really an interested party. But this form of arbitration, by which all litigation is rendered practically impossible, has become so usual in the building trades—while the arbitrators thus appointed are relied upon with all confidence to act honourably to all parties—that their peculiar position is rarely regarded. But although this is so, and the fact is matter for congratulation, and although the Courts have determined to enforce their arbitration clauses in all their stringency, and so keep out lawsuits, still there are instances in which such an arbitrator does really get himself too much mixed up in the matters upon which he will have to arbitrate to be regarded by the law as a proper judge, at all events technically, although personally he might do everyone justice. When this does occur the Court will interfere to put an end to the arbitration agreed upon, but they do so rather reluctantly, and only upon a strong case.

A recent striking example of this was the matter of some contracts between Baring Bros. and Doulton and Co., in which an application was lately made to revoke the submission to arbitration (*Times*, 16 July). The contract was for the supply of materials for the erection of large waterworks at Buenos Ayres, and it contained the usual stringent clause, under which the engineers were sole judges of every question arising out of, or in connection with, the work and the contract, and their decision should be final and binding on both parties. The engineers were a firm which practically consisted of one member who had attended to the works and issued the certificates for the last three years. There was now a dispute as to some thousands of pounds for balance of account due to Doultons, met by Barings with a counter-action for damages for delay in delivery, and Barings now objected to the engineer being sole arbitrator, as he was made under the

contract, on the ground that he had himself brought actions against Barings and the contractor for commission he claimed. Under these circumstances, it was stated that the engineer must be biased, though unintentionally, and a correspondence was read which showed that there had been some warmth of feeling shown by him in the matter. The Court, although admitting that the engineer probably knew more about the facts and the contract than any other man, and although unwilling to interfere in such an arbitration, yet thought things had gone too far, and held that, as there must in all probability be some bias in the mind of the engineer as single arbitrator, they, without imputation of wrongdoing, revoked the submission to arbitration contained in the contract.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

LEGAL INTELLIGENCE.

A BIRMINGHAM BUILDER'S MISFORTUNE.—William Henry Chaffer, builder, of 8, Warstone-parade, Birmingham, attended the offices of the official receiver, Colmore-row, last week, to meet his creditors, none of whom, however, made an appearance. The debts amounted to £918 16s. 3½d., and assets, consisting chiefly of surplus from securities in the hands of creditors fully secured, £494 14s. The debtor began business in Branstreest in 1862, with £40 capital, and in 1872 paid his creditors a composition of 10s. in the pound. In 1874 he erected the premises at 8, Warstone-parade, but in 1886 he was much crippled by a loss of £300 by fire, a shop and contents being consumed, for which he was insured only to the extent of about £30. In 1889 he erected 40 houses in Foundry-road; but he lost money on them. He had been ill since last year, and certain work was taken out of his hands because his illness prevented him from completing it. A portion of the furniture is claimed by the debtor's wife. Being a summary case, the affairs are left in the hands of the Official Receiver.

DISPUTE AS TO QUITTING A QUARRY.—Judgment was given by Lord Stornmouth-Darling on the 20th July in an action by G. and R. Cousin, builders, Alloa, against John Proctor Kyd, solicitor, Dundee, trustee of the deceased James Gentle, builder, Dundee, in which decree was asked for £1,000, as loss and damage said to have been sustained by the alleged failure of the defender to leave Fallows Quarry, on the estate of Strathmartine, of which pursuers are now tenants, in a proper state and condition for working, in terms of the lease. Defender said that the quarry was worked in a proper manner, and that it was left in a proper state and condition, all the obligations of the tenants having been duly fulfilled. The case turned upon the removal of two heaps of rubbish, and his Lordship gave decree for £170 as a sum to cover the cost of their removal, and granted expenses to the pursuers, subject to modification.

IS A URINAL NECESSARILY A NUISANCE?—GRAHAM V. THE CORPORATION OF NEWCASTLE-ON-TYNE.—In the Queen's Bench Division on Saturday, before Mr. Justice Kekewich, the owners of certain houses in Charlotte-square, Newcastle-on-Tyne, applied for an interim injunction to restrain the corporation from proceeding with the erection of a public urinal in the square. It appeared that, by the conveyances under which the plaintiffs claimed, one being dated in 1876, all mines and minerals, and all powers and privileges for working the same, were reserved to the corporation, the grantors, and each conveyance contained an agreement (admitted to be equivalent to a covenant) by the corporation that "the garden or open space" in the square "should for ever thereafter be kept open and unbuilt upon." The corporation had commenced erecting a urinal in the square, the whole being intended to be covered with a cemented and glazed roof, projecting very slightly above the adjoining surface of the garden. The plaintiffs now moved for an injunction to restrain the corporation from proceeding with the works on the ground that they constituted a breach of covenant, and that the urinal itself would create a "nuisance." Mr. Justice Kekewich observed that the plot of ground in question had admittedly been kept, not as a flower or kitchen garden, but merely as an open space. It was, under the covenant, to "for ever thereafter be kept open and unbuilt upon." That meant no more than this—that, being a garden and an open space, it was to be remain "open" in the sense of being unbuilt upon. The words "and unbuilt upon" were merely an enhancement of the word "open." The ground might be built on to some extent and yet remain "open." For instance, a greenhouse might be erected upon it. The words

"and unbuilt upon" were meant only to emphasize the word "open." The building proposed by the defendants was not such a building as would interfere with the surface being kept open. On that point, therefore, the plaintiffs failed. With regard to the other point—the question of nuisance—it was impossible to say that a public urinal was necessarily a "nuisance." That was negatived by the decision in "Vernon v. Vestry of St. James, Westminster," where it was decided by the Court of Appeal that it was possible to have a public urinal without its being a nuisance, even in a large crowded town. His Lordship was not satisfied that a nuisance would be occasioned, but if the plaintiffs established a case of nuisance hereafter they would be entitled to their full remedy. The present motion must, therefore, be refused, but the costs of it would be costs in the action.

ACTION FOR SLANDER BROUGHT BY A BUILDER AGAINST AN ARCHITECT.—At the Assizes at York, on July 22nd, Mr. Justice Day heard an action for slander brought by Mr. Richard Martin, builder and contractor, York, against Mr. Charles Anderson, architect and hotel keeper, York, a member of the York County Council. The damages were laid at £100. At the end of last year the plaintiff contracted to make considerable alterations and improvements in the hotel occupied by the defendant. During the progress of the work disputes arose between the parties. About the end of February it appeared that defendant lost a book on which he seemed to set some value, and he commenced an investigation, during the course of which he distinctly charged one of his servants, named Marion Carr, with having stolen the book and given it to the plaintiff. Counsel submitted that this amounted to a charge that plaintiff had either received the book knowing it to have been stolen, or had induced the girl Carr to steal it for him. At the conclusion of the plaintiff's case, the learned judge, without calling on the defence, held that the words used under the circumstances in which they were used did not convey any imputation of felony. In his judgment, no rational being would ever have thought of bringing such an action. It was really monstrous that the public time should be occupied with such ridiculous cases. He gave judgment for the defendant, with costs.

IN RE C. H. WILLIAMSON.—Under a receiving order granted against Charles Herbert Wilkinson, contractor, of 3, Salters' Hall-court, City, a statement of affairs has been submitted showing liabilities £37,578, of which £70,483 are unsecured. The available assets, which are returned as of nominal value, appear to be wholly absorbed by preferential claims, book debts amounting to £29,867 being considered bad. The debtor, having been for some time manager to a building and tramway contractor, entered in December, 1885, into partnership with another person, and they commenced business at 22, St. Mary-axe, E.C., without capital, as contractors (chiefly in rails and tramways) under the style of "Wilkinson and Co." In 1886 they removed their offices to Salters' Hall-court, E.C. Since the dissolution of partnership in 1890 the debtor has traded alone. The Official Receiver states that the greater part of his indebtedness is in respect of money borrowed and liabilities incurred in connection with contracts for the construction of rail and tramways, which were unfinished at the date of the receiving order. The debtor's insolvency is attributable to the failure of the directors of a railway company to carry out their part of a contract for the construction of a railway to Ireland; also to a depreciation in value of shares taken by him in part payment of contracts, and to law costs and expenses. An adjudication of bankruptcy has been made, and a trustee appointed with a committee of inspection.

THE ARCHITECT AND HIS DUSTBIN.—*ELLIS V. THE STRAND DISTRICT BOARD OF WORKS.*—(Court of Appeal, July 26, before Lords Justices Lindley, Lopes, and Smith.)—This was an appeal of the defendants from a judgment of the Queen's Bench Division, which was in favour of the plaintiff. The action was brought by an architect and surveyor carrying on business in Essex-street, Strand, to recover damages from the defendants for alleged refusal and neglect to collect and remove his house-refuse, in consequence of which neglect the plaintiff said he had suffered in health. The defence was that all that was usual and necessary had been done in the matter, and that all complaints by the plaintiff had been properly and promptly attended to. It was also submitted on behalf of the defendants that, as they had contracted with a sub-contractor to remove all the refuse in the Strand district, they had fulfilled their duties, and although the sub-contractor had not done the work, having become bankrupt, the defendants were relieved from liability. The action was tried before Mr. Justice Grantham and a common jury, and was fully reported in our issue of May 20 last (p. 719, Vol. LXII.). His Lordship then held that the defendants' contention could not be maintained, and the jury gave a verdict for the plaintiff for £75 damages, hence the present appeal. Lord Justice Lindley said the statutory duty of the vestry was

either to employ a sufficient number of persons to remove the dust and rubbish or to contract with others to get the work done. Here they had performed their duty by contracting with others, and Mr. Justice Grantham made a mistake when he told the jury that it was the duty of the vestry to have removed the refuse. The vestry took a right view of their duty, and the appeal must, therefore, succeed, and judgment must be entered for the defendants. Lords Justices Lopes and Smith concurred. Judgment accordingly. An attempt made by plaintiff on Wednesday to reopen the case by way of further appeal failed.

THE ARBITRATION AS TO THE LONDON TRAMWAYS.—The inquiry to assess the amount to be paid by the London County Council for the acquisition by them of the whole of the system of the London Street Tramways Company, which was authorised by Parliament in 1870, commenced on Wednesday at the Surveyors' Institution, Westminster, before Sir Frederick Bramwell, C.E., sitting as arbitrator. The system which is the subject of this inquiry runs from Euston-road to Parkhurst-road, Holloway, and from King's-cross to Kentish Town. Sir Frederick Bramwell will, after hearing the case, make two awards—the first award to be on the basis of the company's contention that the system should be purchased as a going concern, regard being had to future profits; and the second award upon the basis of the County Council's contention that all that Parliament intended them to pay is the actual cost, apart from all profits, of the metals, stables, tramsheds, and other property of the company. By adopting this method of assessing the sum to be paid by the County Council the question of the correct interpretation of the section under which the tramways of this and all other London companies may be purchased will be argued and decided in the Courts.

EMPLOYERS' LIABILITY ACT.—In the Edinburgh Sheriff Court on Monday, an action was raised by John Gibson, joiner, Corstorphine, against John Muirhead, builder, North St. Andrew-street, Edinburgh, for £400 damages for personal injuries. On the 22nd December last, while the pursuer was working for the defender at the Princess Theatre, Edinburgh, the defender's superintendent, Robertson, fell from the front of the gallery on to a scaffolding on which the pursuer was working, causing it to give way. Both men were precipitated to the ground, a distance of about 13ft., and the pursuer sustained severe internal injuries. Sheriff-Substitute Hamilton dismissed the action, finding the defender entitled to expenses. In a note the Sheriff says that he was unable to sustain the relevancy of the action. The case disclosed on record as it appeared to him was one of pure misadventure, for which no one could be held legally responsible.

WATER SUPPLY AND SANITARY MATTERS.

ECCELSFIELD, SHEFFIELD.—Mr. D. Balfour, M.Inst.C.E., F.G.S., of Newcastle-on-Tyne, has been engaged by the Wortley Union rural sanitary authority to report on a scheme of sewage disposal for the town of Ecclesfield, near Sheffield.

MIDSOMER NORTON.—The board having applied to the Local Government Board for sanction to borrow £3,200 for purposes of sewerage, and £500 for the purchase of land for the purposes of water supply, a public inquiry was held at the Market Hall last week by Major-General Henry Darley Crozier, R.E., Government Inspector. The scheme promoted by Mr. Lailey is that known as the international process of precipitation and filtration. Mr. W. B. Beauchamp strongly criticised the scheme, with the view of eliciting the question of treatment in the sewers, the exclusion of the subsoil water, which largely percolates detrimentally into the existing sewer, and to the proposed cost of the treatment, which, he considered, would be excessive. The Commissioner and Mr. Lailey considered that the entry of the water into the sewer would not be detrimental to the satisfactory working of the scheme. Dr. Angell was of opinion that the subsoil water would be beneficial, inasmuch as it would assist in the oxidation of the filter beds.

CHIPS.

The death occurred last week of Mr. Henry Stevens, builder, of Eastbourne, who had erected more than a hundred houses and shops in that town, besides extensive additions to the New College and other public buildings. He is succeeded by his son, Mr. George Stevens.

A new hotel, the Atlantic, has just been built at Newquay, Cornwall, from designs by Mr. Silvanus Trevaill, of Truro. Messrs. Lang and Son, of Liskeard, were the contractors.

The new parish church of Earlston, near Edinburgh, was opened on the 6th inst. The church has been built from plans by Messrs. Hardie and Wright, architects, Edinburgh, at a cost of about £3,000.

Our Office Table.

A SPECIAL meeting of the County Council was held last Friday to further consider the Strand improvement scheme. After a long discussion, and the rejection of several amendments, it was resolved to apply to Parliament next Session for power to construct a new street from Holborn to the Strand, that provision be made in the Bill that the holders of property benefited by the improvement should contribute towards the cost; and that unless Parliament sanctions an equitable division of the cost between the owners of ground values and the occupiers, the scheme shall not be further proceeded with. This practically settles the business, we expect.

THE annual report of the Metropolitan Police Force, issued on Saturday, gives some interesting particulars as to the yearly growth of the Metropolis in respect to houses and streets. It must be premised that the police district is literally Greatest London, having the largest area included under that title. The district extends over a radius of 15 miles from Charing-cross, exclusive of the City of London and its liberties, and embraces an area of about 688 square miles. The rateable value of this area for 1891 was a good deal over £36,000,000. Last year more than 12,000 houses were added to the total in this area, constituting nearly 23 miles of streets. Since 1848 more than 500,000 houses have been built, and the new houses and squares have a length of nearly 2,000 miles. It is noteworthy that the houses are not springing up now at the same rate as in some past periods. In 1881 the addition exceeded 26,000, with 86 miles of streets.

DR. P. L. SCHLATER, the energetic secretary of the Zoological Society, writes to the daily Press, suggesting that the site of Her Majesty's Theatre, now being cleared, probably to be covered with a large hotel and shops, could be better utilised for housing the Royal Academy, leaving the whole of Burlington House for the accommodation of the scientific societies. He points out that Burlington House affords insufficient space to the picture galleries, and also for the accommodation of the Academy students, and urges that no more appropriate site for a new Palais des Beaux Arts could be imagined than that now vacant in the Haymarket. Possibly not; but we should suggest that the bodies to move and seek new quarters should be the Royal, Geographical, the Antiquaries, Chemical, Astronomical, Geological, and Linnean Societies. And surely these bodies are sufficiently wealthy to rent or build their own meeting rooms.

We are threatened with yet another watering-place on the Lancashire coast, probably to be dubbed either Cliftonville or Fairhaven. A large slice of the sand hills between Lytham and St. Anne's, which are at present an immense rabbit warren, has been purchased by Mr. T. Riley, a Fleetwood contractor, from Mr. Clifton, of Lytham Hall. The land purchased is about a mile broad in its widest part, and one feature of it is a natural promontory, extending a considerable distance into the sea, and behind it is a lake covering several acres. Mr. Riley will block up the entrance to this lake, and make provision for filling it at high tides. It is to be stocked with sea-fish, and bordered with a promenade and carriage-drive, to be extended along the shore. Operations have already been commenced.

THE annual meeting of the British Institute of Public Health will be held next month in Dublin, the dates fixed on being August 17th, 18th, and 19th. The congress, both from a scientific and social point of view, promises to be very successful. The meeting will be presided over by Sir Charles Cameron. Papers of public interest will be contributed by the medical officers of health of some of the most important cities and towns in England and Scotland, and the inaugural address will be delivered by the President at the Royal College of Surgeons on Wednesday, August 17th, at 11 o'clock, and on the evening of that day the members will be entertained to dinner at the Lucan Hydropathic by the board of directors. On Thursday, the 18th, the annual dinner will take place at the Royal Marine Hotel, Kingstown, and Sir Henry Cochrane, D.L., chairman of the Dublin Waterworks Committee, will entertain the Institute at the Vartry works at Roundwood on the third day

of the meeting. Other excursions are also in contemplation. The honorary secretary to the meeting is Mr. D. Edgar Flinn, D.P.H., F.R.C.S., of Kingstown.

The sand-blast is now being used in New York for cleaning the marble exterior of the United States Assay Office, in Wall-street. The apparatus consists of a "gun," in the shape of a sheet-tin tube, 3ft. long and 3in. in diameter, which is bent into a goose-neck at one end, and terminates in a 2in. nozzle. A second tube 1in. in diameter enters the first at the upper bend of the goose-neck, and terminates about 3in. inside, being central with the nozzle. The sand is fed through this tube from a hopper, and is projected against the work by an air-blast through the outer tube. It is said that, with an air-pressure of 2lb. per square inch at the nozzle, 1sq.ft. of marble will be abraded to a depth of 1-32in. to 1-64in. in one minute, leaving a fresh, clean surface.

The United States Consul at Catania, in his last report, says that visitors at Catania invariably notice the peculiar soft pink colour of all the unpainted buildings. This colouring is the result of using cement or mortar of proved value, found in the vicinity, and which is nothing more or less than burnt clay. In the frequent eruptions of Mount Etna in times past great beds of clay were covered and buried from 20ft. to 200ft. by the lava streams, with the result, when the eruption happened in the dry season, of burning and converting these clay beds into a fine red gravel or powder. These deposits are mined, and are considered very valuable. The material, mixed with a little lime and the usual amount of water, forms a mortar or cement considered superior to any other cement for building purposes, and has been used in Catania to the exclusion of all other materials for centuries. Every building in Catania is constructed of lava liberally cemented with this mortar. In building, small irregular stones are used just as they happen to come, and a smooth surface is afterwards given by a thin coating of mortar, inside and out, which can then be divided by a trowel to imitate blocks of stone, if desired. This burnt clay, with lime, makes a very strong and adhesive mortar; no other material would hold together the large four and six-story apartment-houses, which are built entirely of small irregular stones. It also has unequalled wearing and resisting power, as the extensive harbour breakwater proves.

The Queensland Institute of Architects and the Builders' and Contractors' Association have adopted a form of conditions of contract which in the main conforms to those generally used in this country, and it is rather remarkable that so many of the professional representative bodies in America and the Australian colonies should have turned their attention to the subject of late. There is, no doubt, room for improvement in some of the forms of contract that have been proposed; but generally they have all been framed on the conditions which have been adopted in the old country, and which have been found by experience to be necessary. In every case a representative committee of experienced and competent architects and responsible contractors is the proper authority to undertake the publication of so important a document.

The Legislature of Massachusetts has just passed, without material change, the building-law for Boston which was drawn up two years ago by a commission of three members: Mr. Minot, representing the real-estate owners; Mr. Stearns, of the firm of Peabody and Stearns, representing the architects; and Mr. Sayward, the Secretary of the National Association of Master Builders, and of the similar local society, and himself a builder of great experience, as the representative of the builders. According to the *American Architect*, the law proposed by these commissioners is in many ways far superior to anything of the kind yet devised. In lieu of being an incoherent mass of rules, founded on the model of the Metropolitan Building Acts of London, as are those of most American and European cities, it is arranged on an independent plan, by which all city buildings are divided into three classes, and the detailed regulations for each class are clear, condensed, and scientific, embodying the conclusions long ago reached by architects, builders, underwriters, and fire-engineers in a practical form. The new broom appears likely to sweep clean, and pending the discovery of loop-holes and impracticable clauses,

the architects and builders of Boston are pluming themselves on possessing the best building code in the world.

The Worshipful Company of Carpenters, in conjunction with the Council of King's College, inform us that the following students have gained prizes or certificates in Professor Banister Fletcher's classes:—1st year: A. W. Makovisky, R. O. Fieldon, F. Clark, Wearing H. J. Mather, W. H. Gurney, S. F. Trill. 2nd year: Trimmell, Allberry, E. C. P. Monson, H. J. Adlard, A. G. Dixon, T. A. Watson, F. W. Bateman, A. A. Dixon. Evening classes: S. Jeffree, E. C. P. Monson, J. R. Johnston, C. J. Aston, F. C. Higgins, T. C. Yates, H. M. Lawson, A. C. Long, F. Mayell, Woodward, E. Searchfield, H. C. Cregeen, H. Allberry, P. Ross.

Trade News.

WAGES MOVEMENTS.

BOLTON.—The strike of plumbers and glaziers at Bolton, which has extended over twelve weeks and brought about a general lock-out in the building trade there, was settled last week by arbitration, and work was resumed on Monday. The trouble arose over rules relating to time of starting in winter, and out of town allowance. The umpire's award places the men on the same footing as those in Manchester and other large towns.

NORTH WALES SLATE TRADE.—At the North Wales slate quarries matters are very unsettled, owing to the refusal of the employers to grant an advance in wages. By a small majority the members of the North Wales Quarrymen's Union have decided that it is inexpedient to turn out at the present juncture; but at some of the quarries, such as that belonging to Lord Penrhyn at Bethesda, there is a strong feeling in favour of a strike.

CHIPS.

Mr. Arthur Turley, of Carlisle, has been appointed surveyor to the local board of Eccles.

Among the works of decoration now being carried out by Messrs. Campbell Smith and Co., of Newmarket-street, W., may be mentioned the Alhambra Palace and Cavour Restaurant in Leicester-square, the Egyptian Hall in Piccadilly, the Hotel Metropole at Brighton, and the Theatre Royal at Bath.

The proprietors of the Royal Institution at Liverpool have under consideration a proposal to remove the valuable William Roscoe collection of old masters' pictures and casts from the Gallery of Art, Colquitt-street, where they are seldom seen, and house them in the Walker Art Gallery, where they will be easily accessible.

The Canadian Dominion Parliament has appropriated 10,000dols. to the purpose of erecting a statue to the late Sir John A. Macdonald. It is intended to invite competitive designs from Canadian and European artists.

The Marchioness of Lorne on Saturday opened the new building situate on Kingston Hill, which has been secured for the Princess Louise Home.

The Grosvenor Club has made arrangements to receive paintings from artists and others, to be hung in the galleries now used as reading and drawing rooms. The first exhibition will take place in October.

Minnis's drapery premises in Lavender Hill, the fatal fire whereat was the subject of a protracted coroner's inquest this spring, have just been reconstructed. Mr. Henry Branch, of Cheapside, was the architect, and Mr. W. Hammond, of York-road, Battersea, the builder.

St. Nicholas Church, Rochester, which was badly damaged by fire last winter, has been restored by Messrs. Collard and Son, builders, and the Bishop of the Diocese will reopen it on Sunday next.

At the last May exams. in building construction the students of the City of London College, under Prof. Henry Adams, obtained 29 places in the Elementary stage, 14 in the Advanced stage, and 2 in the Honours stage: representing a success of 93½ per cent., and over 40 per cent. obtained first-class certificates. An increased prize list is announced for the next session, commencing Oct. 1.

Major-General Crozier, R.E., and Mr. Burd, Local Government Board inspectors, held an inquiry at Wigan on Tuesday into an application by the Wigan corporation for sanction to borrow £70,000 for the purposes of their gas undertaking.

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TENDERS.

* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

ASHFORD, KENT.—For the erection of a bacon factory (exclusive of machinery). Mr. Henry J. Jeffery, M.S.A., architect. Quantities by the architect:—

Baker, W., Ashford...	£3,600	0	0
Denne, W. and T., Walmer	8,480	0	0
Steddy and Co., Ashford...	3,457	0	0
Jarvis, J., Tunbridge Wells	3,445	0	0
Howland, C., Ashford...	3,311	0	0
Wood, J., Ashford...	3,300	0	0
Wallis and Sons, Maidstone	3,264	0	0
Denne, G. H., and Son, Deal	3,249	0	0
Joy, E., Ashford...	3,125	0	0
Knock, H., Ashford...	3,000	0	0

BISLEY.—For two pair of semi-detached villas at Bisley. Mr. R. P. Hammond, Regent's Park, N.W., architect:—

	A.	B.	Credit, old	Total.
			Material.	
Harris, Woking	£821	£204	£30	£1,055
Dinell, London	903	883	10	1,676
Winslade, Chobham	797	883	20	1,660
Norris, Sunningdale	760	890	15	1,635
Peters, Horsham	780	885	15	1,630
Spooner, Bagshot	775	853	98	1,593
Nesmyth, Chertsey*	760	840	17	1,583

* Accepted.

BLAINA, MON.—For the erection of a Wesleyan chapel and schools at Blaina. Mr. F. R. Bates, Newport, Mon., architect:—

Welsh, H., Hereford	£2,420	0	0
Lock, C., Newport	2,335	0	0
Diamond, T. G., Newport	2,310	0	0
Jones, W., and Son, Newport	2,230	0	0
Parfitt, H., Pontnewydd, Mon.	2,150	0	0

* Accepted.

BRAINTREE.—For building a new police station at Baintree, for the Essex county council:—

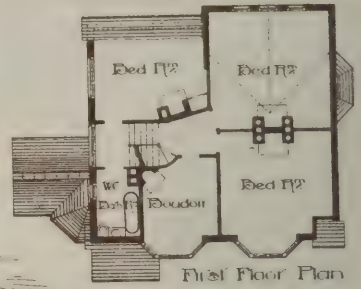
Coxhead, F. J., Leytonstone	£4,497	0	0
Hunt, J. A., Hoddesdon	4,498	0	0
Phillips, C. N., Cheapside	4,459	0	0
Sharp, J., and Son, Amphyll	4,400	0	0
Johnson, F., Chelmsford	4,243	0	0
Everett, H., and Son, Colchester	4,247	0	0
Kimberley, J. S., Banbury	4,246	0	0
Gozzett, J., Maldon	4,198	0	0
Glassecock, J. L., Bishop Stortford	4,100	0	0
West, E., Chelmsford	4,087	0	0
Parmenter, J., Bocking	4,085	0	0
Brown, A., Baintree (accepted)	3,975	0	0

(County surveyor's estimate, £3,700.)

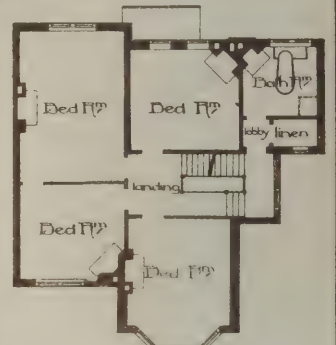
BROOKLEY.—For construction of a portion of a large sewer at Brookley. Mr. Henry S. Legg, Engineer:—

Perry and Co.	£316	0	0
Killingback	810	0	0
Patman and Co.	795	0	0
Nowell and Robson	768	0	0
Mowlem and Burt	721	0	0

"THE NOOK" BENHILTON, SURREY.



HOUSE AT SUTTON.



Ground Floor Plan

First Floor Plan



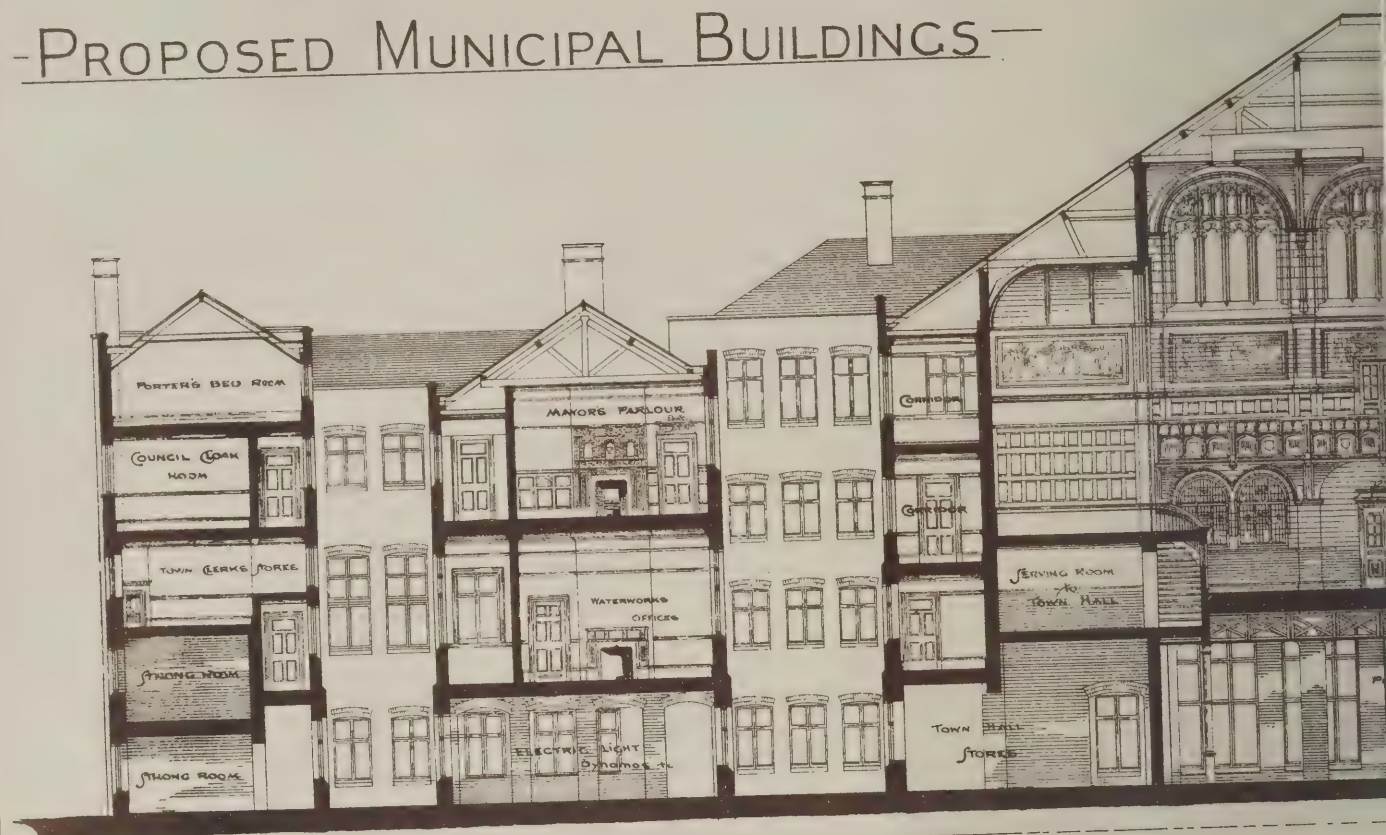
Turret · Staircase ·
STANMORE · HALL ·

Brightwen Binyon
Archit del.

Ipswich.
Mar 92.



— CITY OF OXFORD —
— PROPOSED MUNICIPAL BUILDINGS —



— SECTION A.B. —



JULY. 29, 1892.

— FINAL COMPETITION —

DESIGN BY MESS^{RS} PERKIN & CHESTON, ARCHITECTS



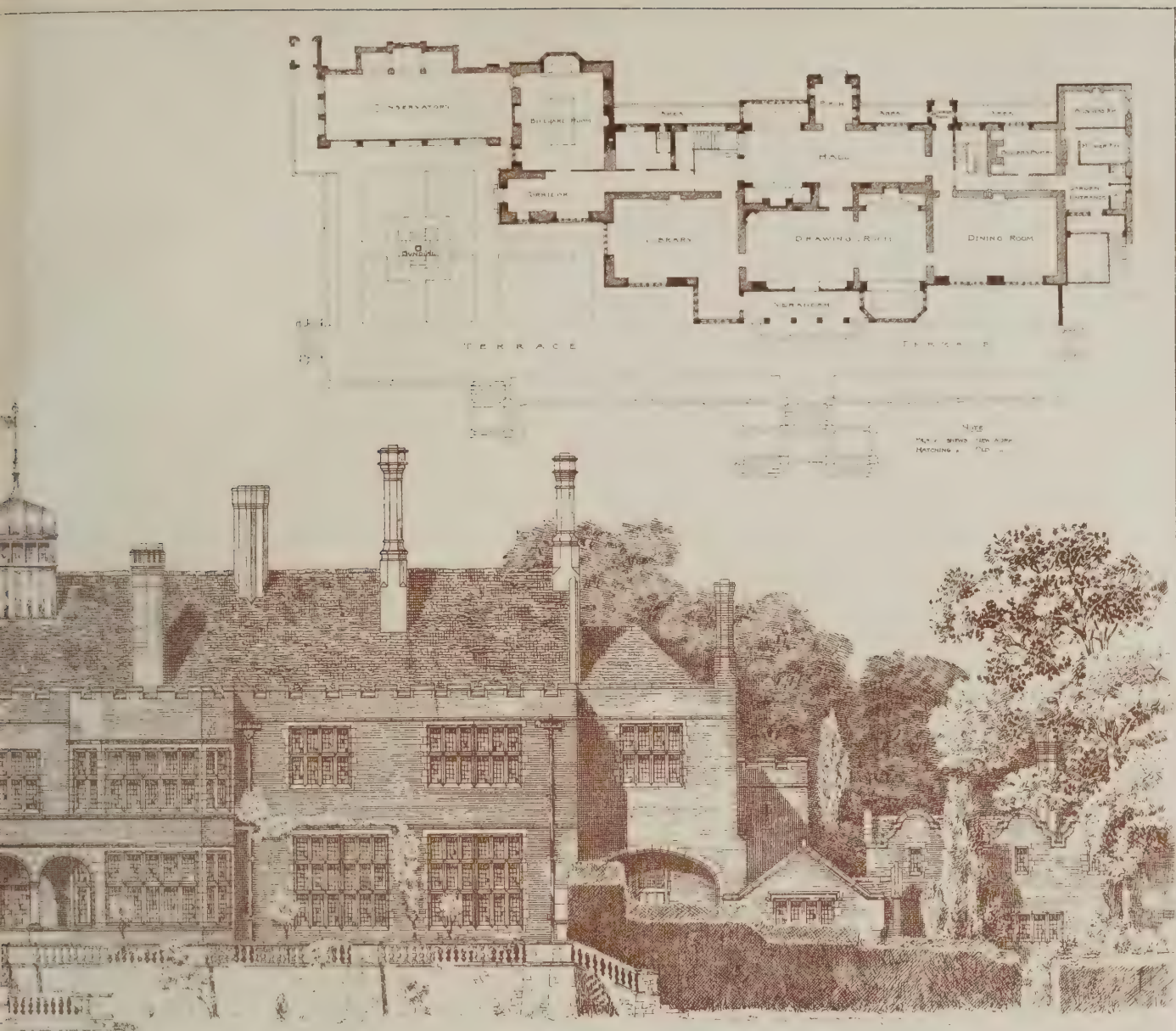
— SECTION C.D. —

SELSDON PARK THE GARDEN FRONT AS ALTERED W.F. UNSWORTH FRIBA. ARCHT

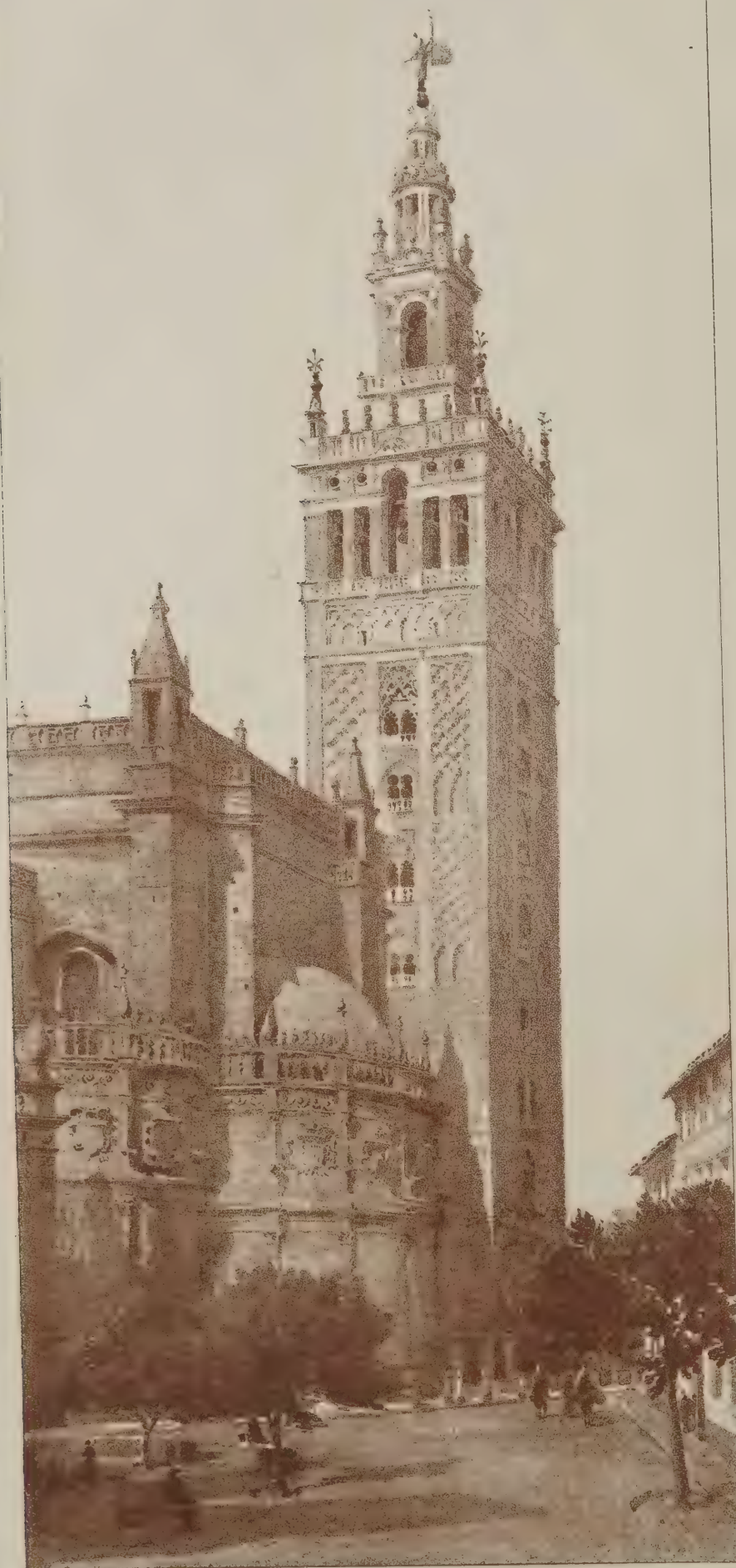


THE ENTRANCE FRONT.





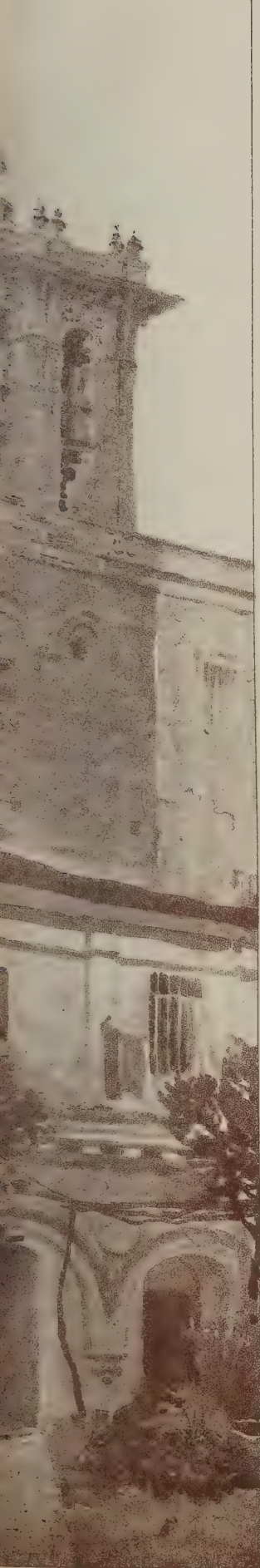
THE GIRALDA TOWER · SEVILLE ·



A COURT IN SEVILLE · SPAIN ·



THE COURT OF ORANGES, CORDOVA.



"PHOTO-TINT," by James Akerman, 41 Queen Square, London W.

THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1961.

FRIDAY, AUGUST 5, 1892.

PITFALLS OF PRACTICE.

THE intrusive spirit of modern utility often mars the dream of the artist. The commonplace requirement is always intruding into the sanctum of the architect; the exigent public are constantly asking for something which he has not taken into his confidence. One client regards the completeness of his conservatory or billiard-room above all else in his mansion; another throws blame on his architect if his chimney smokes, or his bath-room apparatus is not in perfect order; and there are others who, oblivious of all merits of design, reproach their professional guide if anything goes wrong with the sanitary requirements. In whatever direction our profession takes us, the commonplace is extensively present in demands of a more or less trivial kind, and the architect, after a few years' practice, is often reluctantly forced to admit that he has spent more time in the higher work of his profession than is convenient or profitable. In spite of all our art schools and teaching, the ordinary public appear to bring everything to the test of usefulness when their actual requirements are at stake, though they strangely affect to admire art crazes, and adopt the most ludicrous forms of furniture and articles of use in their houses. They will complacently submit to be led by the furniture dealer, but deny to the architect any interference with their particular hobby. We have seen chairs, and tables, and so-called "art furniture," which would shock any first-grade student of an art class by their eccentricities, purchased by people who would never dream of submitting to the architect in their fireplaces or bath-rooms. The perversity of some people in their opinions on these matters is extraordinary. They will "strain at a gnat and swallow a camel,"—buy any piece of ready-made furniture, however ridiculous, but decline to allow their architect to design a dining-room mantelpiece.

But where art and utility strangely come into conflict is in the building, of which every retired tradesman thinks he knows a good deal. A few illustrations will suffice, and some of them are actual recitals. The bugbear of a compact house is one of the commonest the architect meets with. Mr. Brown wants to build a house "without a lot of corner twists and turns." The rule he lays down is that it must be square, like his friend Mr. Malaprop's, without any gables, that his windows must face in a given direction. Of course the problem is enough to dishearten the most courageous disciple of the theory that architecture is the simple expression of utility, or that anything, no matter how prosaic, can be made artistic. Unluckily, few have the courage of this conviction, and when they set to work on the design find that, after all, it is a very hard thing to make a square building agreeable. Mr. Brown's architect is probably too shrewd to endeavour to thwart his client's weakness. He may probably argue with him about the desirability of disposing the fronts of the house in so rigid and primitive a manner, but all the talk in the world about the value of making this part prominent, and of retiring that, of making projection here and recess there accentuate the requirements of the plan, or of grouping and light and shade would have little effect on a man who had grown up with the opinion that a square house is the most economical and compact form in which to build. The

"box" type has a strong claim on the commonplace mind, because it expresses the most simple view of the fitness of a building, and is one that is most readily apprehended by the uneducated mind. It is true there are many noble buildings of this type. We cannot find fault with the Farnese or the Pesaro Palace because it represents a cubical form. Why? Because their dimensions and their fenestral divisions, or superimposed orders, divide the mass into parts. Most of the club houses in Pall Mall, like the Reform and the Travellers', are of this shape—their scale takes them out of the ridiculous; but when we see a spick and span box-like new house somewhere in the suburbs, or in a country road, with centre entrance and side windows, we at once regard it with mingled feelings of disrespect and amusement, and can only compare the great example with the small as we look upon the two dogs in that famous picture by Landseer of "Dignity and Impudence."

Almost equally repugnant to the architectural sense is the flat roof. Mr. Handyman makes one condition to his architect, and that is that the roof must be flat. It is so convenient to be able to walk on the flats, or to take up a few friends occasionally to indulge in a chat, or smoke, especially in the summer evening, when the rays of the sun are not too strong. With an even more sordid mind Mr. Gradgrind thinks a roof should be turned to useful account, and may be made a convenient airing ground for drying linen. Again, economy is urged in construction. The very excellent iron joists and concrete construction, covered with a layer of asphalt such as that of the Claridge Asphalt Company, makes a strong and impervious floor for walking upon. The only objection is that there is no visible roof. The Mansard, the pavilion and the gable are forms which give grace and picturesqueness to buildings, they aid in breaking up the roof or skyline; but the straight level top is always hard and unsightly, as we see it in many lately built blocks of "flats." A deep, projecting cornice, as in the Italian palaces, or a balustrade with terminals is the only way of finishing the walls of a large flat-roofed building, but even then, without some irregularity in the plan, this sort of crowning is wearisome and monotonous. Much less endurable is a small building so treated. We can sympathise with the architect under the trying ordeal of having to consult the Gradgrinds in his design for a "Queen Anne" villa. That style has certainly been found flexible enough to allow of a flat surrounded by a balustrade or railing, as well as a tile roof of steep pitch. So far it is accommodating to the most ordinary taste, if that taste is not carried too far as a "fad." A man with a hobby is also exacting and very aggravating to the compliant designer, as the said hobby must be pronounced at the expense of the building. Thus, Mr. Hortus is an amateur floriculturist, and is intent on making the conservatory a decided feature in his new house, and, to make things more awkward, has a notion of his own which cannot by any coaxing be made to adapt itself to the architecture. It is to be a lean-to against the front of the residence. No one knows the mental anguish to the architect in arranging such a structure of glass and iron so that it should be at any rate unobjectionable artistically, and also to comply with the owner's ideas as to slope, method of ventilation, and the construction of the sashes and lights.

The exactions of materfamilias are equally repressive to the artistic mind. What with baths and hot water, nurseries and domestic fittings, the internal arrangements maintain a constant *hors de combat* with the architect's intentions. In town buildings and public edifices, the demands of utility are con-

tinually enforcing themselves upon the designer. The shop front, with its irredeemable ugliness and plate glass, requires all the art and invention of the most resourceful mind. The large, unobstructed shop, with iron columns supporting upper walls, girders, and staircases, take away every means of architectural effect, leaving the decorator and art metal-worker full masters of the situation. The fittings are bizarre, the brass chandeliers and stained glass vulgar and obtrusive. Again, the huge party-wall overtopping the adjoining houses, or the ugly ramping of the back premises to allow light to ancient windows, and lofty chimney stacks are most intractable features which are to be specially dealt with. How best to mitigate and soften these incongruous features, and make them at least less repulsive to the eye, is a task which, we believe, ought to rank higher than that of designing an elevation or a piece of ornament. Just as a general who by successful tactics can divide the mass of the enemy's forces or cut off a position from the base of his operations is greater than he who throws his whole force into the breach with great slaughter, so an architect who can manipulate the ponderable mass of material by skilful adaptation or inventive methods displays his artistic power far more than one who can cover sheets of drawing-paper with designs at a cost of so much per foot of surface. Inventive architecture, or how to overcome difficulties and conquer ugliness, it cannot be too forcibly impressed, is a far greater achievement than any elaborate designing of plain, uneventful building. Can we make architects think so? The very obstacles which their clients place in their way can be surmounted if they tackle boldly the problems of utilitarian every-day building, if they heartily enter into the requirements of practical people instead of completing the design to suit their own tastes, and according to existing standards and precedents. Design to please, instead of design to overcome, has been the formula too generally adopted by the architect. When he can make a flat roof or a factory chimney presentable, and convert a huge square galleried structure from obtrusive hideousness into one that is at least tolerable to the sight, he can say that he has done something to deserve the title he has chosen.

BY-LAWS AND "JERRY" BUILDERS.

THE general effect of building by-laws in our large towns has been to lessen considerably the growth of that mushroom, "jerry building." We have all along foreseen the consequences of local authorities making by-laws to protect the ignorant tenant. Once put into operation a code of building regulations to compel builders to put in good and dry foundations, to use concrete over the areas, to build proper walls, and to provide areas in front and in rear of every dwelling house, and it could easily have been predicted that jerry building would die a natural death. This has, in fact, taken place in many towns we know; the "jerry builder" is far less a personage than he used to be, for he has found out that if the poor ignorant tenant does not know a good and sanitary building from a bad and unhealthy one, there are authorities under whom he lives that will protect him from the clutches of those who put up fever traps under the guise of genteel houses bedizened with the allurements of tessellated paving, stained-glass panels, and pretty fireplaces. Though these superficial attractions are still potent in the minds of many people, their value has been much discounted of late. The builder of "rows" of suburban houses has found out that he can ill afford to concrete the foundations and build substantial walls at the same time as to supply tessellated

tiling for the lobby and hall and leaded glass to the door panels, and that these little embellishments must either be omitted altogether or be of a very inferior quality, if he has to pay the ground-rent and mortgagee. We fancy somehow that rather than forego these decorations, something else will be devised in the shape of a set-off, for we believe there are still many people who would rather suffer a bad drain or inferior closet apparatus than be deprived of the coloured tiles and gilded lead lights on their house front. For all that, the jerry builder will find it much harder than he has done to satisfy the tenant, as well as the town authorities; for if the tenant looks after his ornament, the local authority will take good care that the building is at least sound and safe.

In a recent discussion at the Manchester City Council the question turned on the operation of certain building by-laws, and a letter in the *Manchester City News* shows at least that the by-laws of that city have had considerable influence in checking the jerry builder. In the case of Manchester, as in many other large cities, it is not quality of building so much as the question of open space in the rear of dwelling houses, that has scotched the building octopus. There is a valuable clause, by-law 49, which declares that every person who shall erect a new dwelling house shall provide in the rear thereof "an open space exclusively belonging to such house, and of an aggregate extent of not less than one hundred and fifty square feet, and free from any erection thereon above the level of the ground." This space is to extend laterally throughout the entire width of house, and the distance across such open space is not to be less anywhere than 10ft., which means that if there should be a projecting building or offices, the end of such offices should not be less than 10ft. from the fence or wall of the premises in the rear. The by-law goes on to enlarge this distance with the height of the house, so that if the dwelling house be 15ft. in height, the distance shall be 15ft., if the height be 25ft. the distance to be at least 20ft.; if the height be 35ft., or exceed that height, the distance to be 25ft. The effect of which rule is that the lowest tenement of two stories would have to allow a distance across the back area of 15ft. at least, whereas for ordinary two-story houses of 25ft. high the distance must be 20ft. This distance is small enough, as it only allows 40ft. between the back walls of houses of a superior class. The by-law also requires that no addition or alteration made to the house is to diminish the extent of open space, and that the height is to be measured from the "level of ground over which such open space shall extend to the level of half the vertical height of the roof, or to the top of parapet, whichever may be the higher."

"These by-laws," says the writer of the letter, "have killed jerry building in Manchester, and the above-quoted has, more than any other, been the cause of its death. Birdcage builders on the city council admit that had they foreseen its sweeping effects they would never have consented to its being passed." He goes on to say that one effect of such drastic by-laws will be to call attention to the price of land, that makes the building of good houses at a fair rent an impossibility, and the building of barrack-like dwellings a necessity.

We have here one of the chief causes which have served to restrain jerrybuilding in large towns. The effect of the by-law as to open space will be, it is argued, to limit the number of small houses of the class we have described, and to encourage the building of blocks of dwellings or flats. We doubt very much this inference. Results have shown that the well-to-do working-man or city clerk with small means prefers to take a two-storied dwelling

with a sufficient area of ground in the rear, than to rent a flat. In London we have ample proof of this preference. The many-storied blocks of dwellings are tenanted by single men or those with small families; the six or seven-roomed dwellings in our suburbs, such as those at Plaistow, Leytonstone, Loughborough Junction, are occupied by thousands who can just manage to pay out of their incomes the cost of a moderate railway journey. As a matter of fact, it will be found that the latter class of dwellings pay the best. The idea of an immediate return for capital invested has been the mistaken policy of those who look at the problem of providing house accommodation for the masses on a purely price-of-land basis. To argue that the building of good houses at a fair rent is an impossibility in some towns is one of the plausible excuses made by landowners and speculative builders, who create themselves fictitious ground rents. Thus a capitalist middleman lays out an estate; he forms the roads and sewers, and recoups himself for his expenditure by making out agreements with builders for the erection of rows of houses. The leases are granted from the middleman at a much higher rent than he himself has paid to the landowner. The result is that the builders actually pay double the rent to the middleman that he pays to the landowner. We know, for instance, of several cases where a landowner grants a lease to a capitalist at a small rent. Roads are laid out, and the estate is let off in small plots at a rent which is more than double, often treble, that for which he has taken it. When the houses are built, he can take up leases at, say, £5 per house and grant leases on the same houses to the builders at £12 per house. Who can wonder that the price of land under such circumstances is too great to allow of a well-built house to be let at a fair rental? Again, as pointed out by the writer of the letter we have named, land is purposely kept out of the market to secure a rise in price, and this rise is occasioned by nothing the owner has done, but by improvements made by the municipal authorities, a strong reason for rating vacant land on the increased value created by the improvements made in the borough. Corporations themselves ought to be able to secure vacant plots for building dwellings in the vicinity of any important works, and a fair standard value could then be secured. The horror of the proposed barracks in Manchester is the result of private speculation in building, by which double the fair rent is charged for a certain area of land; but these monopolists of land, aided by the jerry builder, find it convenient to lay the blame not on covetousness, but on the by-laws, which only insist on sanitary dwellings being erected, and a curtilage of land granted that will secure health and convenience.

THEATRES.—III.

By ERNEST A. E. WOODROW, A.R.I.B.A.

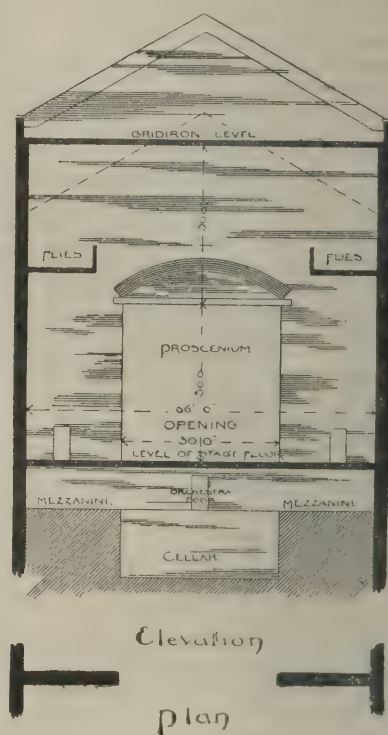
HAVING now fully considered the question of a site for a theatre so far as the surroundings are concerned, it is desirable to see what advantages, if any, can be obtained from a sloping as opposed to a level plot of ground. The benefits to be gained in facilitating the means of exit by building on a sloping site are fully illustrated by the manner in which the Savoy Theatre, London, is planned. Here every peculiarity and irregularity of the formation of the ground is called into account to assist the speedy egress of the public. As most of my readers are aware, the ground slopes from the Strand towards the Embankment. The dress circle is placed on the entrance level from the Embankment; the upper circle exit is level with the side street to the east, known as Beaufort-buildings, and the gallery staircase is very short, and delivers into the street to the west of the building. The dressing-rooms, which are on the level of the street and in the rear of the stage, have their separate exit to the north; the

stage is sunk below the ground level. The advantages thus obtained by the natural formation of the ground diminish the length of the exits from all parts of the house which cannot be gained unless under such exceptional circumstances as these. Where a level piece of ground is the only available plot in a town for a theatre, it must not be despised, because the difficulties can be, and have been, overcome by sinking part of the theatre below the ground. The object of such arrangement is, of course, to equalise the length of the exits from all parts of the theatre, whether from the auditorium or the stage, and—even at the risk of repetition—let me again impress upon the architect who would build a theatre, that the safety, comfort, and welfare of the actors are as much to be desired as the safety, comfort, and welfare of the public. If it were not for actors, and the art of acting, there would be no theatres. Why, then, has their safety been so neglected? We shall, later on, dwell fully upon the necessary requirements of that part of the theatre appertaining to the performers; but for the moment, in choosing the site, do not forget that the "back" of the theatre has to be considered as well as the "front" of the house.

Modern requirements demand smaller theatres

Proscenium Wall

looking towards Auditorium



than in years gone by. Every actor, or actress, who has made his or her mark, is seized with a desire to build a theatre and become "sole lessee and manager." Hence there has arisen a demand for a smaller playhouse accompanied by less financial risk than the large opera houses and patent theatres of the past. As in these smaller theatres it is easier to obtain ready means of egress for the lesser number of people accommodated, so also it is easier to construct them in a manner to permit every division of the audience to be placed as near the street level as possible. In order to accomplish this we find the modern theatres of the west end of London with the pit sunk below the level of the street, and deep excavations made for the formation of the stage and its appurtenances.

There is another great advantage in diminishing the height of the building: it lessens the risk from the consequences of fire, and affords greater facilities to the firemen in executing their work of rescue. A theatre, to be a safe building, must be a theatre pure and simple, and not part of any other building. I may even go so far as to say, considering isolation a necessity, not part of any block of buildings. The great fire

authority of this country, speaking on this subject, says that "shops round theatres and forming part of the same block of buildings are always more or less objectionable, and even under the most favourable circumstances should on no account be permitted, unless the contents are safe from explosion, and the walls, ceilings, and roofs able to resist any fire which could happen in them. This can be done without the smallest difficulty, and consequently there can be no excuse for omitting to do it A theatre would be most safe if standing alone: every house in its vicinity adds to its danger; its risk is greatest when it is entirely surrounded with houses."

I have pointed out elsewhere the folly of spoiling a good theatre site by erecting shops, cafés, or restaurants as part of the scheme. The very spaces required for exits are swallowed up in shops in order that a rental of a few pounds a year may be paid into the manager's pocket. For the sake of this sum the public are endangered to a certain degree, for if the exits are not curtailed in number, the passages are made longer and more tortuous, and deliver, perhaps, into some narrow side street. If shops are included as part of a theatre scheme, they are sure to be given the very best position on the site for the sake of the rent, and the entrance to the theatre is cramped in consequence. Now, as we have seen, the majority of the people frequenting a theatre will use the entrance as the means of egress; therefore the public are endangered by the presence of shops, cafés, &c., &c., quite apart from the actual fire risks.

Theatres should not be constructed either over or under other premises, for reasons which are clearly obvious—i.e., the addition of fire risk, and the diminution of exit space. In London this is forbidden by the sixth rule of the London County Council:—

"(6) No theatre shall be constructed underneath, or on the top of, any part of any other building."

The problem before the architect is to limit the height of the building, so as to bring the topmost gallery seat as near the pavement level as possible, and at the same time not to bury the stalls in the bowels of the earth. An important part of this problem is, while limiting the height, not to limit the number of seats, so that the house cannot hold sufficient "money" to pay as a commercial undertaking.

The best way, as far as I know, to overcome these difficulties is to adopt the system above referred to of partly sinking the theatre below the ground. Mr. Buckle, in the book he has written upon theatre construction, illustrates and describes his ideas of a theatre erected within what he terms an excavation or moat. The problem Mr. Buckle set himself was that the gallery, and not the pit, should be entered on the street level. The writer says that the theatre nearest approaching this desirable consummation is the much-abused Criterion Theatre, London; but he qualifies his praise of this structure by stating that the arrangement of the superstructure over the theatre deprives the auditorium of light and air, which is altogether unsatisfactory. It is well-known that there is not the danger of falling going upstairs, that there is going down, and for that reason a partly-sunk theatre has an advantage over one built high above the ground-line; but Mr. Buckle's scheme is for a theatre on an isolated site without a single public staircase, inclines only being used; there is an open area or space of 25ft. wide from the external walls of the building to the boundary-wall of the site. By this arrangement it is claimed that every part of the theatre may be lighted by windows, perfect ventilation be secured, and absolute control in the event of fire. The gallery, being on the street level, is entered by bridges spanning the moat; other parts of the house are approached by inclined roadways down the moat to the various levels; all these roadways are 10ft. wide. With the internal arrangements of this plan we have at present nothing to do; but it appears at a glance that the site required to hold Mr. Buckle's theatre would be a most expensive one, as, in addition to the area actually covered by the theatre proper, a "moat" of 25ft. wide all round the building is required to be added to the area of the site. The building itself would be 190ft. long by 70ft. wide, the saloons 25ft. wide, and the corridors 10ft. wide, the auditorium 75ft. by 70ft., the stage 70ft. by 40ft., the workshop and dressing-room blocks each 70ft. by 25ft.

Before concluding my remarks upon the height

of the building I must make some reference to the legislation on this point. We find the London County Council has thought some restriction necessary, for in their new rules, No. 7 reads that—"No such premises shall have more than three tiers or horizontal divisions, including the gallery, above the level of the pit. Where the front seats of the gallery are separated from the gallery by a partition, such seats shall not count as a separate tier."

In St. Petersburg theatres must not contain more than four tiers of boxes and galleries besides the pit; and in Italy tiers of boxes shall not exceed three in number, exclusive of the gallery. The pit also shall be on a level with the street, or not more than 6ft. 6in. above it.

In New York there is a special provision prohibiting the introduction within the structure of any hotel, boarding house, lodging house, factory, workshop, manufactory or store, with the exception of such as are strictly required for the theatre use.

No. 8 and No. 9 of the London County Council's regulations also appertain to this subject, and I give them *in extenso*. No. 8 has principally to do with the comfort of the audience in giving sufficient head-room and air-space over the pit and gallery, and No. 9 restricts theatres being erected above other premises, or being buried in the bowels of the earth. This rule would prohibit Mr. Buckle's scheme being carried out in London.

"(8) Where the first tier or balcony extends over the pit, stalls, or area, the height between the floor of the pit and the first tier shall not be at any part less than 10ft., and the height between the floor of the highest part of the gallery and the lowest part of the ceiling over the same shall not be less than 12ft.

"(9) In all such premises the floor of the highest part of the pit, or of the stalls where there is no pit, shall not be more than 6in. above the level of the street adjoining the principal entrance to the pit, and the lowest part of the floor of the pit or stalls shall not be more than 15ft. below such level."

The difficulties of drainage must not be lost sight of when placing part of a theatre below the street. In many instances where this has been done, pumps have had to be called into requisition to keep the cellar of the stage dry, as once below the main-drainage level, the water accumulates in the lowest part of the building. This pumping is a constant expense to the management, with which it should not be burdened. The cellars must be kept dry whether the house is open to the public and earning money, or closed, and money going out without any return. Frequently the engines have to be run daily for this purpose alone. It may, however, be presumed that a cellar below the drain could be so constructed as to insure the exclusion and prevent the percolation of the surface water.

In the present days of advance and demands for modern improvement and luxury, the manager may be certain that if he builds with the times, he is sure to obtain compensation for his additional outlay, by judicious advertisement of the many virtues his house possesses. Crowds flocked nightly to the Savoy when first opened, not only to see "Patience," but to visit the first theatre in London entirely lighted by the electric light. In the same way, managers introducing latest improvements into the construction of the theatre are sure to meet with an equal reward of public patronage.

There appears to be one other consideration which I should notice with regard to the site question. We have seen the advantages to be gained by isolation in reducing the fire risk and increasing the exit accommodation; but we have not yet considered the great assistance that must be afforded to light and ventilation in having a site upon all sides of which windows can be obtained; but ventilation which is only obtained from some inclosed area or small court or alley is no ventilation at all, for the air is frequently most impure, especially when drawn from a slum or back court. Windows are most valuable in a theatre, and for many reasons over and above the important one of ventilation; where a theatre is well flooded by daylight there is not the risk of the accumulation of dirt and rubbish in the house that there is in a dark and unlit building. There is the saving, too, of the use in the daytime of artificial light, the saving of expense, and of the risk which accompanies the cleaner's oil lamp. How is it possible for the cleaners to thoroughly cleanse such a building as a theatre by the

dim flicker of a smoking oil lamp? The sweeping, dusting, and scrubbing must be superficial indeed, and the rubbish that is swept up and hidden away in corners becomes the source of great danger from fire. In a paper which I wrote upon the prevention and extinction of fire in theatres, and which was by the request of the Council of the Society of Arts printed in the *Journal* of that society, I drew attention to this point as follows:—"Daylight and cleanliness are essential for the prevention of fire. Where ample daylight is admitted, there is every chance of the theatre being swept and kept clean in every corner; collections of rubbish, dirt, and dust, in out of the way nooks and corners, are always a source of danger. Dry dust, paper, shavings, oil-rags, and such like inflammable refuse, ready to ignite by spark or spontaneous combustion, are often found swept away out of sight by the cleaners. Such carelessness and thoughtlessness are too often the cause of fire. The use of matches, the burning ends of cigars or cigarettes, recklessly thrown among those dangerous little heaps of rubbish, is sufficient to start a fire which may end in dreadful results and loss of life."

In the Austrian regulations there is a clause which impresses upon the manager that "cleanliness generally in all parts of the house is to be a special duty."

In Austria such importance is placed upon the desirability of having plenty of window space that a special rule is framed, that "all parts of the house must be well and sufficiently lighted by windows."

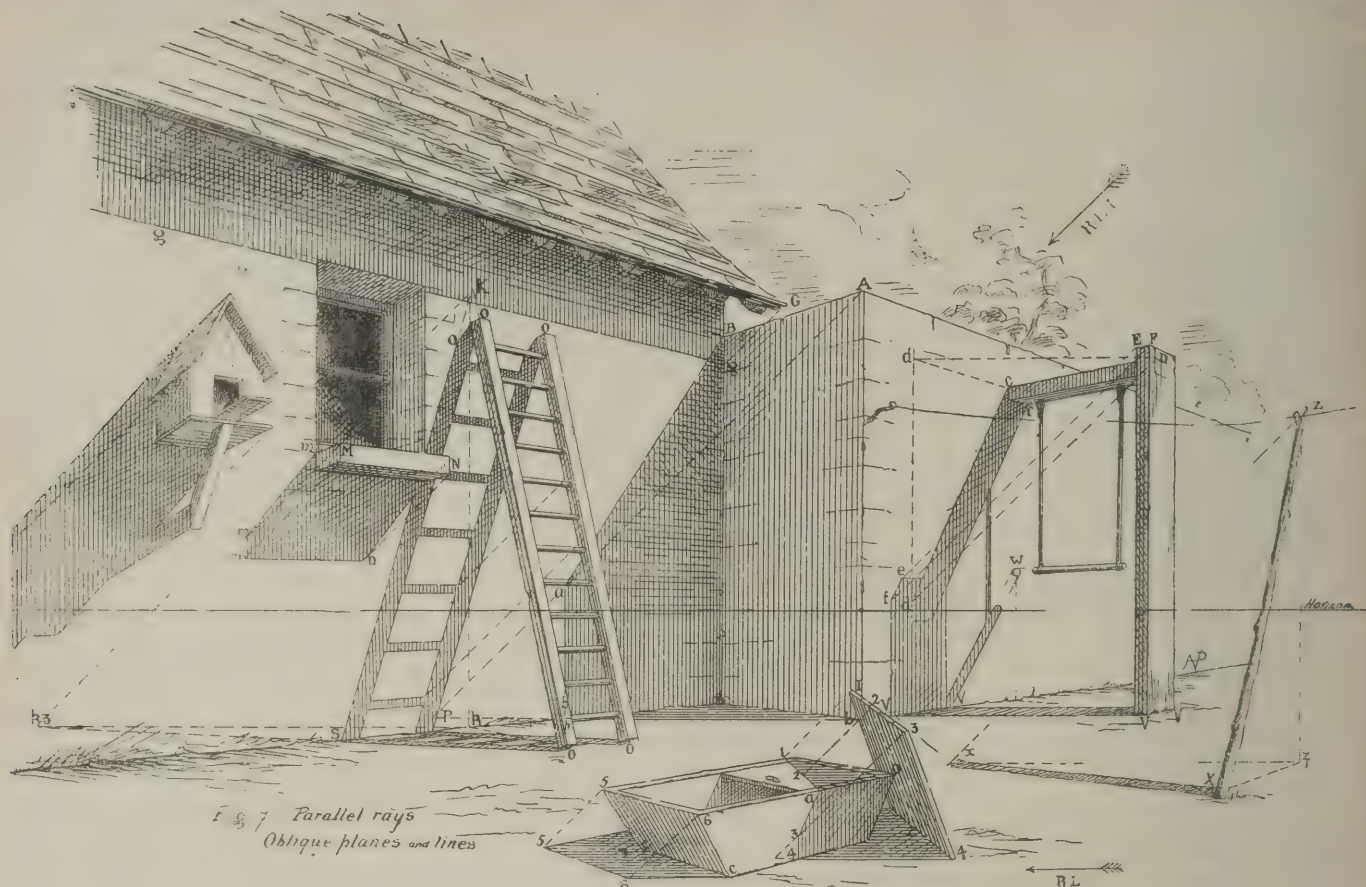
Where light is obtained by skylights, there is always a danger during a fire of falling materials breaking the glass and conveying the fire to other portions of the premises; or where a fire occurs in premises overlooking the theatre, there is the risk of the fire spreading to the theatre through the skylight. To provide against this, Rule No. 23 of the London County Council appears to have been called into existence. It reads thus:—

"All skylights, and the sloping sides of lantern lights, shall be protected by galvanised-iron wire guards, securely fixed on the outside of such skylights or lantern lights."

Windows have yet another valuable office to perform in theatres, as they provide ready means of escape in cases of fire, especially where outside balconies are provided. Where there are windows at every level the fireman can make use of the fire escape as a means of rescue for those within the building. Every window should have an outside balcony—in fact, one may go so far as to say that every tier or floor, whether of dressing-rooms or of the auditorium or offices, should have continuous balconies with stairs leading down to the balcony below. In New York this is compulsory: "There shall be open balconies not less than 4ft. in width at each level or tier above the parquet, on each side of the auditorium, of sufficient length to embrace two exits, and from said balconies there shall be staircases extending to the ground level, with a rise of not over 8 $\frac{1}{2}$ in. to a step, and not less than 9in. tread exclusive of the nosing; the staircase from the upper balcony to the next below shall not be less than 30in. in the clear, and from the first balcony to the ground 3ft. in width in the clear, where the seating capacity of the auditorium is for one thousand people or less; 3ft. and 6in. in the clear where above one thousand, and not more than eighteen hundred people; and 4ft. in the clear where above eighteen hundred people and not more than twenty-five hundred people; and not over 4ft. 6in. in the clear where above twenty-five hundred people. All these balconies and staircases shall be constructed of iron throughout, including the floors, and of ample strength to sustain the load to be carried by them, and they shall be covered with a metal hood or awning to be constructed as shall be directed by the superintendent of buildings."

It would be well if similar provision were compulsory in England, as in New York and some Continental cities. Mr. James Springer's new Municipal Theatre for Amsterdam is provided in every tier with such balconies. Mr. Phipps has also adopted them at the Shaftesbury Theatre, which, I believe, is the only example we have in London of this provision for public safety.

In Paris, if the theatre is separated from adjacent premises, or if it has internal areas suitable for escape in case of fire, the side fronts and those abutting on these areas must be



furnished with fixed iron ladders in a straight line with the windows, or with special openings made for the purpose.

Iron bars or grilles before windows are most objectionable, as they prevent them being used as means of escape. French windows opening outwards and fastened only by automatic bolts would be a good form of window from the parts occupied by the audience.

Another feature must be noted before leaving the outside of the theatre to consider the internal arrangements. The differences of levels of the various roofs should be approached by iron ladders for the use of the firemen, and permanent cat-ladders should be placed so that the whole of the roofs can be traversed with ease.

SHADOWS IN PERSPECTIVE.—IV.

By ARTHUR VYE PARMINTER.

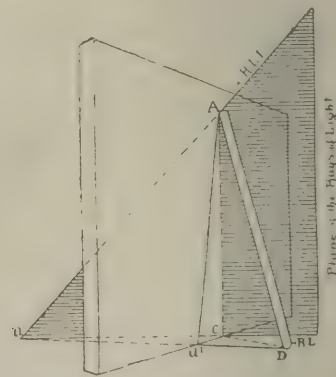
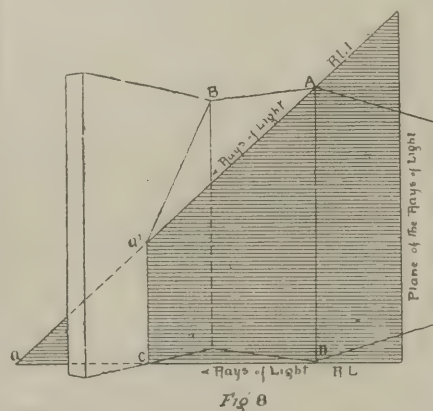
WE have studied the system of shadows thrown by rays of light parallel to the picture plane—firstly, front planes and right angles; secondly, oblique planes and vertical lines; and thirdly, what we are going to treat of in this article: oblique planes and oblique lines. Before considering the Fig. 7, we will take the examples of the constant rule for shadows in Figs. 8 and 9. These two figures will enable the student to thoroughly understand the construction of all the shadows in the general view, Fig. 7. We have to find the shadow thrown by the projecting portion of the wall B A D—that is to say, the traces of the shadow of lines B A, A D. Now we know that to find the shadow of a point, we must pass through this point, and the projection of this point on the ground plane—a plane parallel to, and therefore containing, the rays of light, and also contained in this plane and through the point a line in the direction of the rays. For instance, through the point A and its projection D on the ground, or the line A D, we pass the plane A a D containing the rays of light R L I, R L. The shadows of the point A will therefore be at a, the point of meeting of the line R L I, and the horizontal line R L. But we notice that this plane intersects the wall at c a 1, or the vertical raised from c when the horizontal meets the wall. The shadow, therefore, is stopped at c a 1, and a 1 is the shadow of point A on the wall. The line forming a 1 and B will also be the shadow of the line A B. The shadow

is thus contained by the lines A B, B a 1, a c 1, c D.

Again, in Fig. 9 the pole A D, leaning against the wall at the point A, throws a shadow against the wall. To find the shadow of the line A D, it will suffice to find the shadow of point A, by means of the plane containing the rays of light passing through this point and its projection C on the ground. We find the shadow of A will be at a on the ground plane; the line forming a and D would be the shadow of A D. But the shadow plane is intersected by the wall at A and C, and we find that the line a D, the shadow of A D on the ground, is stopped by the wall at a 1;

ground and partly against the wall. From the ground point b of the angle A b we draw a horizontal line meeting the wall of the building at b (this line is the line R L of Figs. 8 and 9 in the plane of the rays of light), and from point A, the line A a in the direction of the rays of light, and corresponding to R L I in Figs. 8 and 9). From point b, where the horizontal ground line meets the wall, we raise a vertical, meeting A a at a; if, now, we join a and B, we complete the lines of the shadow of B A, A b.

Let us now take the ladder leaning against the wall. We will find the shadow thrown by the



a 1 D will therefore be the portion of the shadow on the ground, the remaining portion falling on the wall from a 1 to A, the substitute to a 1 a on the ground. The shadow of A D is thus, A a 1 D.

In Fig. 7, which we have made as simple as possible, we have the oblique planes of the building and wall, and the oblique lines of objects which cast their shadows on the oblique planes. These objects are composed of lines at different angles and positions, as regards the wall and ground planes. For each of the objects we must proceed as in Figs. 8 and 9. The rays of light still arrive parallel to the picture plane, and at any given angle to the picture plane.

Let us first find the shadow thrown by the projecting wall B A, which will be partly on the

line O O. We must produce O O to K against the wall, and from K drop the vertical K k; k is therefore the projection of K on the ground plane. From point k we draw a horizontal line k k 3 (R L, Figs. 8 and 9), and from K a line in the direction of the rays of light (R L I, Figs. 8 and 9) meeting k k 3 at k. From point k 3 we draw a line to ground point O, and meeting the wall at S; if, now, we join S K we shall have the shadow line of O O at O S, S K. The shadow of point O will be found by drawing a line in the direction of the rays, and meeting the line S K at O the shadow of O. The shadows of the remaining lines are found in a similar manner, and are sensibly parallel to O S, S O. The shadow of the rungs of the ladder are similarly obtained by

means of lines from each rung to the shadow lines.

The shadow of the window-sill MN may be left for the student to work out himself.

The swing support is somewhat similar. From D the trace of the line CD, we draw the horizontal line Dd, meeting the wall at d on the line Cd from the vanishing point, and from d we drop the vertical line dd, meeting the line Dd (in the direction R L I) at d. Point d will, therefore, be the shadow of D, and d c joined the shadow of D C. The horizontal Dd (representing R L, Figs. 8 and 9) is, in this case, more conveniently drawn in the air from point D than from the projection of D on the ground, and is evidently similar to that which would be drawn on the ground plane.

For the upright support F V V, we draw from V V the horizontal lines V V, V V, meeting the wall at V V, and from these points we raise verticals. The shadow line from F meeting the vertical line from V at f, determines the shadow f V V of the line F V. The shadow e of point E is found by means of similar lines from the projection of E on the ground. We may again notice that in this case, also, the shadow on the ground is interrupted by the wall, and, therefore, continues vertically on the wall plane.

The shadow of the trapeze may be constructed by the student by means of the same rules, and the trace W of the bar on the wall.

That of the inclined clothes-pole is similar to the shadow thrown by the ladder; but in this case the shadow continues uninterruptedly along the ground. We find the projection of z on the ground at y by means of the vertical from Z and the line X y to the vanishing point. By means of the plane passed through Z y—that is, the horizontal line z x and the line Z x in the direction of light—we find the point x the shadow of Z. The line forming x X is thus the shadow of Z X.

The shadow of the inclined end of the box is obtained by means of horizontal lines from the points O C, and the lines of light 55 and 66; also the line from 5 to the vanishing point. The cover of the box leaning against the corner O is similarly constructed. A horizontal line from 4 meets the side of the box at 4; from this point we raise a vertical line, meeting the light line from 3 at 2, the shadow of point 3. Through point O, where the cover touches the angle of the box, we draw a line parallel to 34, and from point O a horizontal O2 meeting the line of light from 2 at 2. Through the point 2 obtained we draw a line to the vanishing point of the cover (a point different to that of the general perspective), 12a, and join a3. The shadow is thus contained by the lines 12a, a34, 44.

The shadow of the dove-cot should now represent no difficulties to the student. The eaves of the roof throw its shadows as far as g g. The shadows of the soffit and side of the window cover the window entirely, as may be seen by tracing the constructional lines. In all of these cases we now understand that the system of construction does not vary; in every case it consists in passing a plane containing the rays of light vertically and horizontally through the line or point throwing the shadow, and taking into account the intersection of this plane with other planes it may meet.

PRICES.*—XLII.

(All Prices Include Profit, and have had all Trade Discounts taken off.)

IRONMONGER (continued).

HOBBS' LOCKS

For rebated locks add to the prices already given 1s. 6d. for 3in. to 4in., for 4in. rebated and for 5in. to 6in. 2s. each, and for 7in. to 10in. 2s. 6d. each, and 1s. for 11in. in extra thickness of lock beyond 7in.

For full rebated locks add to the prices given 5s. for 3in. and 5s. 6d. for 4in., and 6s. 6d. for 5in. to 6in.

MORTISE LOCKS, with double clutch bolt fixed— £ s. d.
No. 580 3 by 3in., with 2 keys each 0 19 0
582 4 by ditto ditto 0 22 0
586 6 by ditto ditto 0 23 0
588 6 by ditto ditto 0 27 0

Ditto, single clutch, fixed—

No. 604 3 by 3in., with 2 keys ditto 0 14 0
606 4 by ditto ditto 0 13 6
607 6 by ditto ditto 0 13 0

No. 582 and 607 if made with moulded or beaded H plates to order, 6s. to 12s. extra each.

FLUSH NIGHT LATCHES, 1-sided, extra strong, fixed—
No. 20 2 4in. 4 lever, 2 keys each 0 8 6
20 4 ditto 3 keys ditto 0 10 0
120 2 4 6 lever, 2 keys ditto 0 11 6
18 3 4 lever, 2 keys ditto 0 12 0
18 3 ditto 3 keys ditto 0 13 6
20 2 4 keys ditto 0 11 6
20 2 6 keys ditto 0 14 6

POLISHED BRASS PLATES, flush latch, fixed—
No. 16 3 4in. 5 lever, 3 keys ditto 0 15 0
Extra keys 1s. 6d. each, and if made to order 2s. each.

PATENT FLUSH NIGHT LATCH, fixed—
No. 2 2 4in., 3 keys, to open with the key only from the outside, knob on the inside to draw back bolt each 1 2 0
No. 4 2 4in. ditto, but with the knob to turn on the inside and not to draw back ditto 1 4 0

RIM NIGHT LATCHES, 1-sided, extra strong, 3 keys; 2 keys 1s. less, fixed—
No. 10 F 4in. 4 lever, 2 keys each 0 8 6
10 F 4 ditto 3 keys ditto 0 10 0
11 F 4 6 lever, 2 keys ditto 0 11 6

The above to open with the key only from the outside, bolt to draw back.

No. 10 F, with 4 keys ditto 0 11 6
10 F 6 keys ditto 0 14 6
9 F 3in. 4 lever, 2 keys ditto 0 12 0
9 F 3 ditto 3 keys ditto 0 13 6

Extra keys 1s. 6d. each, made to order 2s.
No. 1 F 4in., 3 keys, best quality ditto 1 0 0
4 F ditto, with the knob to turn on the inside ditto 1 2 0
Keys 2s. each, ditto to order 2s. 6d. each.

FLUSH LOCKING LATCHES 2-sided, to open inside by a knob, and to open and double lock with the key inside or outside, fixed—

No. 21 2 4 by 3in., for doors 2in. thick, strong each 0 11 9
21 2 4 by 3in. ditto, 2 1/2in. thick ditto ditto 1 2 0
27 2 4 by 1 ditto, 2 1/2in. ditto ditto 1 9 0
30 2 4in., and 2 keys ditto 1 9 0
32 2 6 ditto ditto 1 15 0
34 2 6 ditto ditto 1 18 0
36 2 9 ditto ditto 2 8 0

With brass cases, extra 4s. to 8s.

MORTISE DRAW-BACK STREET-DOOR LOCKING LATCHES, follower action, and 2-sided, fixed—

No. 1 H 6 by 3in., 3 lever, for 1 1/2in. doors each
2 H 6 by 4 ditto 1 1/2in. ditto ditto
4 H 7 by 4 ditto 2 1/2in. ditto ditto
6 H 8 by 5 ditto 2 1/2in. ditto ditto
7 H 9 by 5 ditto 3 1/2in. ditto ditto

These locks are complete with knobs and 2 keys.

PATENT MORTISE DITTO, best quality, fixed—

O 1 H 6 by 3in., with 2 keys ditto 1 18 0
O 2 H 7 by ditto ditto 2 2 0
O 3 H 8 by ditto ditto 2 10 0

The above have ebony or brass knobs.

UPRIGHT DRAW-BACK MORTISE LOCKING LATCHES, with follower action and 2-sided, fixed—

No. 8 H 2 by 3in., 3 lever and 2 keys each 0 18 6
9 H 2 1/2 by 3 ditto ditto 0 17 0
10 H 3 by 3 ditto ditto 0 16 0
11 H 4 by 3 ditto ditto 0 16 0
18 H 3 by 4 ditto ditto 0 15 0
19 H 4 by 4 ditto ditto 0 15 0
20 H 4 by 5 ditto ditto 0 17 0

DITTO PATENT, best quality, fixed—

No. O 4 H 2 by 3in., with 2 keys ditto 1 15 0
O 5 H 2 1/2 by ditto ditto 1 15 0
O 6 H 3 by ditto ditto 1 15 0
O 7 H 4 by ditto ditto 1 15 0
O 8 H 4 by ditto ditto 2 0 0

Complete with ebony or brass knob.

Rebated locks 1s. 6d. to 6s. extra each.

Bronze metal bolts 1s. 6d. to 2s. 6d. extra.

MANSION DOOR LOCKS 2-sided, fixed—

No. 30 H 8 1/2 by 3in., 4 lever, extra strong, 2 keys ditto 1 6 0
Ditto, with latch and drawback bolt, fixed—

No. 32 H 8 1/2 by 3in., 5 lever, and bronze metal bolt ditto 1 10 0

All knobs extra.

Best ebony, the set of 3, fixed, 4s. 9d.

Plain brass, ditto, 6s. 9d.

Bronzed octagon, complete, for each lock, 9s. 9d.

Fine finished locks, extra, each 1s.

22c. 8in. rim, with latch and drawback bolt, with knobs complete, and strong ditto 1 7 0

24c. 11in. ditto ditto extra ditto ditto 1 18 0

These rim locks are complete with 3 round brass knobs.

Octagon knobs extra, 6s. to 15s.

Locks mounted with brass ribbon border extra each 0 10 0

MORTISE dead locking latches (2 sided), to open and lock on both sides, with the key only fixed—

No. 21 H 1 1/2 by 3 1/2 lever spring bolt only each 0 14 0
2 H 2 by ditto 2 keys ditto 0 17 6
3 H 2 1/2 by ditto ditto ditto 0 16 6
4 H 3 by ditto ditto ditto 0 12 0
5 H 3 1/2 by ditto ditto ditto 0 13 0
7 H 6 by ditto 4 lever ditto ditto 0 13 0
9 H 4 by ditto ditto ditto 0 14 0

Fine finished extra, 1s. each.

PATENT DITTO, best quality, fixed—

No. O 28 H 2 1/2 by and 2 keys ditto 1 10 0
O 30 H 3 by ditto ditto 1 10 0
O 33 H 3 1/2 by ditto ditto 1 10 0
O 34 H 4 by ditto ditto 1 15 0
O 38 H 4 by ditto ditto 1 18 0
O 39 H 7 by ditto ditto 2 5 0

Bronze metal bolts, 2s. 6d. to 3s. 6d. extra. These latches, used for asylums and reformatories, &c., should have a steel shield plate outside the keyhole, extra 2s.

SPRING BOLT LOCKING LATCHES, fixed, adapted for shop doors, closets, to be opened by the handles on each side of the door, and having spring bolt— £ s. d.

3 by 3in. No. 24 Y light bolt each 0 4 6
3 1/2 by 25 Y ditto ditto 0 4 6
6 by 26 Y broad ditto ditto 0 5 6
6 by 27 Y extra ditto ditto 0 6 6
7 by 28 Y ditto ditto 0 9 0

LEVER LOCKS for park, field, and area iron gates, not fixed—

4 1/2 by 4 by 3/4 light iron gate, dead lock, with bronze metal bolts, No. 35, 2 keys each 0 11 6
5 by 4 1/2 by 36 ditto strong, ditto ditto 0 18 0
6 by 5 by 37 ditto ditto ditto ditto 1 1 0

4 1/2 by 4 by 3/4 draw back, with bronze metal bolt, No. 235, light, with 2 keys each 0 9 0
5 by 4 1/2 by 3/4 ditto strong No. 236, strong ditto 0 14 0
6 by 5 by 3/4 ditto ditto 237, ditto ditto 0 18 0

Field gate-locks, with chains and bronze metal bolts, 15s. to 19s. each, unfixed.

For hunter's gate-paddock, 18s.

Clutch bolt locks for securing sliding gates and doors, 38s. to 55s., with 2 keys, fixed.

4 by 3in. 2-bolt mortise in galvanised case, strong, for area gates, 2 keys, fixed.

Galvanised cases to locks, 1s. each.

Projecting bolts, 1s. 6d. to 3s. each.

WATER-CLOSET LATCHES, fixed—

6in. 2 bolts brass flanged rim, with 2 bolts, No. 151 X each 0 8 6

6in. japanned flange rim, 2 bolts ditto 0 6 0

3 1/2in. flush brass latches, 2 bolts, with sunk slide bolt, No. 55 X ditto 0 4 9

6in. ditto, with brass knobs, No. 56 X ditto 0 11 0

3 1/2in. rim, japanned, No. 57 X, with slide-bolt ditto 0 3 9

4in. mortise, No. 58 X ditto ditto ditto 0 7 6

3 1/2in. flush brass, 2 bolts, with sunk slide-bolt with knob inside, and to open outside with a ward key and 1 key ditto 0 6 2

Extra keys, 9s. per dozen.

VARIOUS LATCHES, to be opened on the outside with a key and inside with a knob, 1 bolt, flange rim, with key and knob inside only, fixed—

6in. 1-bolt brass case, 1 ward key each 0 10 0

Ditto japanned ditto ditto 0 7 6

3 1/2 by 3in. mortise and 1 ward key ditto 0 6 6

6 by 1 1/2 ditto ditto ditto ditto 0 7 0

Extra keys, 12s. per dozen.

SPECIAL BRASS LOCKS for ships, state rooms, pleasure yachts, and marine residences, fixed—

3 by 3in. rim dead lock each 0 11 6

4 by ditto ditto ditto 0 15 6

3 by mortise ditto ditto 0 12 6

4 by ditto ditto ditto 0 16 6

3 by single clutch mortise, 1 key ditto 0 18 9

6 by ditto ditto ditto 1 4 3

6 by 2-bolt mortise ditto ditto 1 1 0

7 by ditto ditto ditto 1 3 0

4in. 2-bolt moulded rim ditto ditto 0 18 0

3 1/2 ditto flanged rim ditto ditto 0 15 0

6 ditto ditto ditto ditto 0 13 9

6 ditto moulded rim ditto ditto 1 1 0

7 ditto ditto ditto ditto 1 4 6

LIFT-UP MORTISE LATCH for front doors, horse-boxes, &c., fixed—

For lift-up handles and for thumb-latches each 0 11 6

Ditto with double bevel bolt ditto 0 12 0

No. 430 a complete, with lock half-raised, egg-shaped handle ditto 1 5 0

PATENT PROTECTOR SAFE LOCKS for securing the bolts of common safes, unfixed—

3 1/2 by 3 1/2 by 9-16 6 lever, No. 470 each 0 14 0

3 1/2 by 3 1/2 by 8 ditto 472 ditto 1 8 0

5 by 5 by 8 ditto 475 ditto 2 15 0

8 by 8 by 1 1/2 8 ditto 490 ditto 6 0 0

COMBINATION BOLTS and Locks and Royal Albert door bolts, unfixed—

Fig. 769. Mortise combination bolt, 2in. to centre of follower, for locks 3 B to 27 B each 2 2 0

Ditto for locks with 2 bolts ditto 2 8 0

Patent protectors ditto 3 12 0

Fig. 766. Albert bolts for mortising with edge of door prepared for swing doors ditto 0 19 0

Ditto for folding doors half rebated ditto 1 2 0

COACHHOUSE and Railway Station door locks and bolts, unfixed. Where the fixing has to be added, the kind of wood must be borne in mind, as there is a good deal of labour in the fixing; the value in deal is 5s. to 7s. each, varying with the kind of bolt—

No. 792. Bolting only top and bottom, the top part bolting both doors each 2 17 0

791. 1 bolt at top and 1 at bottom ditto 2 12 0

Ditto with central bolt and 2 at top, as No. 792, and made to lock ditto 3 12 0

Extra for solid plugs for stone or brass sockets ditto 0 5 0

Extra strong for gates above 8ft. 9s. 6d. to 19s. extra.

777. Strong combination rim lock, patent protectors, three-way action, with very broad strong bolts and sockets complete, with bolts 10in. ditto 7 12 0

Ditto light 8in. ditto 6 5 0

712. Extra strong patent protectors mortise dead three way action combination lock ditto 6 0 0

722. 4 1/2in. three-way action combination lock for fixing in door stiles ditto 6 0 0

Half rebated extra ditto 0 5 0

Full ditto ditto 0 9 0

VICTORIA CASEMENT BOLTS, fixed in deal—		£	s.	d.
No. 58. For 1½ in. stiles.....	each	1	3	0
67. Gothic pattern for 1½ stile.....	ditto	1	12	0
Ditto nickel plated.....	ditto	2	6	0
If with cross handle, 2s. extra.....				
Illuminated, black or red, extra.....	ditto	0	9	6
70. Superior make for 1½.....	ditto	2	0	0
Ditto with plain cross handle.....	ditto	2	0	0
74. For 2½ in. stiles.....	ditto	1	9	0
52. For 1½ stiles, with flush handles.....	ditto	1	10	0
Ditto with cross handle.....	ditto	1	7	0
56. Superior for 1½ stiles.....	ditto	1	8	0
Ditto nickel plated extra.....	ditto	0	15	0
If three-way action top, bottom, and centre, extra.....	ditto	0	4	0
80. Espagnolette bolts, extra strong, ½ bolt 6ft. long.....	ditto	2	12	0
No. 82 medium, ½ bolt, 5ft. long.....	ditto	1	9	0
If to lock extra with lever lock.....	ditto	0	9	6
SPECIAL SUITES OF EXTRA-STRONG OFFICE FURNITURE, locks for railways and bankers, merchants, clerks, fixed—				
Bank of England pattern locking latch till locks.....	ditto	0	14	0
Key chains with swivels.....	ditto	0	1	6
No. 30 K 2½ in., 6-lever till locks with 2 keys.....	ditto	0	6	0
32 K 3.....	ditto	0	7	0
34 K 3½.....	ditto	0	8	0
30 L 3 in., 6-lever out cupboard locks, with 2 keys.....	ditto	0	6	6
32 L 3½.....	ditto	0	7	0
34 L 4.....	ditto	0	8	0
30 M 3.....	ditto	0	7	0
and 2 keys.....	ditto	0	7	0
32 M 3½.....	ditto	0	7	6
34 M 4.....	ditto	0	8	6
32 P 3.....	ditto	0	6	9
34 P 3½.....	ditto	0	7	3
36 P 4.....	ditto	0	7	9
ORDINARY lever drawer or till locks, fixed—				
No. 10 K 2 by ½ mortise or cut, with 1 key.....	ditto	0	3	0
11 K 2 by ¾.....	ditto	0	3	0
12 K 2 by 1.....	ditto	0	3	0
13 K 2 by 1½.....	ditto	0	3	3
14 K 2 by 2.....	ditto	0	3	3
15 K 2 by 2½.....	ditto	0	3	3
16 K 2 by 3.....	ditto	0	3	3
17 K 3 by ¼.....	ditto	0	3	9
18 K 3 by ½.....	ditto	0	3	9
5-levers fine-finished and steeled keys 2s. extra.				
BEST QUALITY ditto fixed—				
No. 3 K 2 by 1½ deep and 2 keys.....	ditto	0	10	6
4 K 2 by 2.....	ditto	0	11	6
5 K 2 by 2½.....	ditto	0	11	6
6 K 3 by 2.....	ditto	0	12	0
7 K 3 by 2½.....	ditto	0	14	0
8 K 3 by 3.....	ditto	0	14	0
9 K 4 by 2½.....	ditto	0	15	6
LINK-PLATE cupboard locks for sideboards, to lock in front, fixed—				
No. 10 o 2 by ¾ 2 lever, 2 keys.....	ditto	0	3	9
11 o 2½ by 1½ ditto ditto.....	ditto	0	4	6
12 o 3 by 2 ditto ditto.....	ditto	0	4	6
13 o 3½ by 2½ ditto ditto.....	ditto	0	5	3
Five-lever, fine-finished, and steeled keys, 2s. extra. These locks can be had in pairs, 2 with keys to pass, less 1s. the pair.				
BEST QUALITY ditto—				
No. 1 o 2½ in. with 2 keys.....	ditto	0	12	6
2 o 3 in. ditto.....	ditto	0	13	6
3 o 3½ in. ditto.....	ditto	0	14	6
Locks in pairs, 2 with keys to pass, less 1s. the pair.				
PEDESTAL LOCKS.—The prices of these to lock at side are the same as those above which lock in front.				
Small flat keys, after the Yale pattern, are made to order for several of the locks, nickel plated, at about 3s. extra.				
SLOPING desk locks, fixed—				
No. 15 q 2½ in., with 2 keys.....	ditto	0	3	9
16 q 3.....	ditto	0	4	6
17 q 3½.....	ditto	0	5	3
18 q 4.....	ditto	0	6	3
2 q 2½ in., extra quality, 2 keys.....	ditto	0	12	0
3 q 3.....	ditto	0	13	0
4 q 3½.....	ditto	0	14	0
5 q 4.....	ditto	0	15	0
ORDINARY OUT CUPBOARD locks, fixed—				
No. 9 L 2 by ¾ wide, mortise or cut, and 1 key.....	ditto	0	3	0
10 L 2 by 1.....	ditto	0	3	0
11 L 2 by 1½.....	ditto	0	3	0
12 L 2 by 2.....	ditto	0	3	6
13 L 2½ by 1½.....	ditto	0	3	9
14 L 3 by 1½.....	ditto	0	3	9
15 L 3½ by 1½.....	ditto	0	4	3
16 L 3½ by 2.....	ditto	0	5	6
117 L 4 by 2½.....	ditto	0	6	0
1 L 2 in., with 2 keys, best quality.....	ditto	0	10	6
2 L 2½.....	ditto	0	11	6
3 L 3.....	ditto	0	11	6
4 L 3½.....	ditto	0	13	0
5 L 4.....	ditto	0	14	6
Cupboard locks with spring self-locking bolt or with double claw bolt, extra 5s. each.				
No. 11 M 2½ by 1½ 4 levers, straight cupboard lock, and 2 keys.....	ditto	0	4	3
12 M 3 by 1.....	ditto	0	4	3
13 M 3½ by 1½.....	ditto	0	4	9
14 M 4 by 1½ with 3 in. long bolt.....	ditto	0	5	6
16 M 4 by 2½ 4 lever, 2 keys.....	ditto	0	6	0
The above locks are double handed.				
1 M 2 in., 2 keys, best quality.....	ditto	0	10	6
2 M 2½.....	ditto	0	12	6
3 M 3.....	ditto	0	12	6
4 M 3½.....	ditto	0	12	0
5 M 4.....	ditto	0	14	6

JAPANNED iron locks, lin. double handed, fixed		£	s.	d.
18 M 4 by 2 2 lever, 1 key.....	each	0	2	9
20 M 4 by 2½ 4 ditto ditto.....	ditto	0	3	9
Box or chest locks, fixed—				
No. 30 p 1½ by ¾ deep, mortise or cut, with 1 key.....				
31 p 2 by 1.....	ditto	0	3	3
14 p 2½ by 1.....	ditto	0	3	3
15 p 2½ by 1.....	ditto	0	3	9
16 p 3 by 1.....	ditto	0	4	6
17 p 3½ by 1.....	ditto	0	5	3
18 p 4 by 2.....	ditto	0	6	3
38 p 4 by 3.....	ditto	0	9	6
23 p 4½ by 4.....	ditto	0	12	6
Ditto, best quality—				
No. 1 P 2 in., with 2 keys.....	ditto	0	11	6
2 P 2½.....	ditto	0	12	6
3 P 3.....	ditto	0	13	6
4 P 3½.....	ditto	0	14	6
5 P 4.....	ditto	0	15	6
6 P 4½.....	ditto	0	16	6
8 P 3½ by 2½.....	ditto	0	16	6
9 P 4 by 3.....	ditto	0	18	0
10 P 6 by 4.....	ditto	1	4	0
LONDON Patent Protector ditto, unfixed—				
2½ in. for cash and deed boxes.....	ditto	0	11	9
3 ditto ditto.....	ditto	0	12	9
3½ ditto ditto.....	ditto	0	14	0
4 ditto ditto.....	ditto	0	14	9
2½ in. lever machine made.....	per doz.	1	12	0
3 ditto ditto.....	ditto	1	17	6
3½ ditto ditto.....	ditto	2	6	6
4 ditto ditto.....	ditto	3	15	0
About 7½ per cent. is added to the four last prices for single locks.				
Extra price with cheeks and screws for lever locks, 3s. 6d. per dozen locks.				
Fall-down front door boxes with nozzles, add an extra of 4s. per dozen.				
PORTABLE writing desk, or camp desk locks, unfixed—				
No. 10 T 2½ by 5-16 (depth to key, ¾) 3 lever ditto.....	0	6	0	0
12 T 2½ by 5-16 (ditto 9-16) 3 ditto ditto.....	0	6	0	0
14 T 2½ by 5-16 (ditto 3) 3 ditto ditto.....	0	6	0	0
16 T 3 by 1 (ditto ¾) 4 ditto ditto.....	0	7	0	0
18 T 3 by 1 (ditto ¾) 4 ditto ditto.....	0	7	0	0
20 T 3 by 1 (ditto ¾) 4 ditto ditto.....	0	8	0	0
22 T 3 by 1 (ditto ¾) 4 ditto ditto.....	0	9	0	0
1 T 2½ in., 2 keys.....	ditto	0	10	3
2 T 3.....	ditto	0	11	3
3 T 3½.....	ditto	0	12	3
4 T 3½.....	ditto	0	13	3
Locks for office and cabinet furniture, 45 H lever suites—				
These locks are made to order, with a master key to pass; price up to 30 locks 1s. each extra; above 30 and not exceeding 80, 1s. 6d. each; beyond 80 locks, 2s. each; silver master keys, 18s.; 16-carat gold ditto, 42s.; 1½ long.				
Locks for cabinet and office furniture to pass with 2 keys 6d. less than the prices given for each lock.				
If half a dozen locks, then 8d. a lock each less.				
Locks ordered with one key instead of 2, 4d. less.				
Door locks and latches, mortise or rim to pass, are charged 1 key 9d., 2 keys 1s. 6d. less per lock.				
WARDROBE (cut cupboard), combining a lock and a latch, fixed—				
No. 309 small size, ½ in. to pin, 2 keys.....	each	0	5	3
309a ditto 1 in. ditto.....	ditto	0	5	9
310 4 by 2 wide 4 lever, 2 keys, key-hole ¾ from selvage.....	ditto	0	7	3
312 4 by 2½ 4 lever, 2 keys.....	ditto	0	5	9
314 4 by 2½ ditto ditto.....	ditto	0	6	3
315 4 by 2½ ditto ditto.....	ditto	0	7	3
230 4½ by 1½ best quality 2 keys.....	ditto	0	14	0
232 4½ by 2 ditto ditto.....	ditto	0	14	0
Five levers fine finished and steeled keys, 2s. extra.				
SLIDING DOOR, back-action, locks fixed—				
No. 280 4 by 1 in. (key hole ¾ in.) clutch bolts.....	each	0	16	0
LINK PLATE, wardrobe, fixed—				
No. 300 4 by 2½ 4 lever (¾ from keyhole to centre of link) 2 keys.....	each	0	5	9
302 4 by 2½ 4 lever (1½) 2 keys.....	ditto	0	6	3
304 4 by 2½ ditto (1½) ditto.....	ditto	0	7	3
Five lever, fine finished and steeled keys, 2s. extra.				
No. 2 6 2½ by 1½ best quality (keyhole 1½ and ¾ to centre of link).....	ditto	0	16	6
208 4½ by 2½ (keyhole 1½ and 1½ to centre of link).....	ditto	0	16	0
IRON PADLOCKS, extra strong—				
No. 45 I 2 in. 3 lever (japanned brass interiors, 2 keys.....	each	0	2	9
50 I 2½.....	ditto	0	3	3
60 I 3.....	ditto	0	4	9
66 I 4.....	ditto	0	6	10
67 I 2.....	ditto	0	6	10
70 I 2½.....	ditto	0	3	9
79 I 3.....	ditto	0	5	9
81 I 4.....	ditto	0	7	3
BRASS PADLOCKS, extra strong—				
No. 26 I 1 in. 4 lever, 2 keys.....	each	0	4	3
27 I 1½.....	ditto	0	5	3
28 I 2.....	ditto	0	5	9
30 I 2½.....	ditto	0	6	9
32 I 3.....	ditto	0	7	9
34 I 3½.....	ditto	0	9	6
39 I 3½.....	ditto	0	14	3
41 I 4.....	ditto	0	15	3

with bronze metal or bright shackles, 1s. each extra.		£ s. d.	
No. 1	I 1 best quality, 2 keys	each 0 11 6	
2	I 1½ ditto ditto	ditto 0 10 6	
3	I 1 ditto ditto	ditto 0 9 6	
4	I 1½ ditto ditto	ditto 0 11 6	
5	I 1½ ditto ditto	ditto 0 12 6	
6	I 1½ ditto ditto	ditto 0 13 3	
7	I 2 ditto ditto	ditto 0 14 3	
8	I 2½ ditto ditto	ditto 0 15 3	
9	I 3 ditto ditto	ditto 0 16 8	
10	I 3½ ditto ditto	ditto 0 19 0	
11	I 4 ditto ditto	ditto 1 3 0	
CHANGEABLE railway letter padlocks, 2½ in. by 2 in., very strong		each 1 4 6	
PIASTER gate bolt locks, made to design from 50s. to 80s. each, fixed. Ornamental shell extra 10s.			
DOUBLE claw till cupboard locks, fixed. Add 3s. 6d. each to prices of locks given.			
LOCKS made to owners' keys for cabinet furniture, under 12 locks 3d. each, extra to price of locks without keys.			
KEYS cut to pattern are charged 8s. per dozen, extra to prices of keys. N.B.—Patent locks 6d. each extra.			
LOCKS made to owners' keys for office and street door latches, lever, and patent locks 1s. each extra; ¾ thick. Locks and latches ½ and ¾ thick 6d. each extra. The keys cut to pattern are charged 6d. each. Extra prices for extended suites of locks to differ 6d. to 1s. each up to 6,000, and at list prices up to (¾ in. thick) 175; ¾ thick up to 500; 1½/16 up to 1,200. Cabinets and padlocks to differ supplied at list prices. 4 lever up to 140, 5 lever up to 360, 6 lever up to 1,720. Extra prices for extended suites, 4d. to 1s. extra up to 8,000.			
LOCK KEYS—	£. s. d.	£ s. d.	
1½ in. per doz.	0 6 0	2 in. per doz. 0 10 0	
1 in. ditto	0 7 0	2½ in. ditto 0 15 0	
1 in. ditto	0 8 0	3 in. ditto 1 1 0	
BANKERS' changeable key, bank-note, and bill case locks £5 10s. each, unfixed.			
ENGINEERS' folding keys			each 0 4 0
Steel key rings engraved			ditto 0 1 6
Steel chains and registration label			ditto 0 2 0
LOCKS for master keys to pass cost from 1s. to 4s. Extra per lock for master key fitting, and so much per key beside. A complete suite, consisting of 53 varieties, ¾ thick, 2s. each up to 80 locks; above 80 and under 500, 2s. 6d. each extra; above 500 and under 4,000, 3s. each extra. Master keys, plain, are 2s. each beyond the fitting to locks. Various locks, ¾ in. thick, are charged 1s. 6d. each extra. Patent protector locks add 6d. extra.			

NOTES ON THE FACTORY AND WORKSHOP ACT, 1891, 54 & 55 VIC. CAP. 75.*

THIS Act, which came into force on the 1st of January of this year, constitutes an important addition to the duties of municipal engineers and surveyors and of inspectors of nuisances throughout the country. The Act is chiefly an amendment of the Factory and Workshop Act, 1878, which is operative throughout the United Kingdom, and is much larger in its scope for the purpose with which it deals than the Public Health Act, 1875, which does not extend to Scotland or Ireland, nor generally to the Metropolis. The new Act is to be administered partly by the inspectors of factories, and partly by the sanitary authorities, the latter expression including both urban and rural sanitary authorities, and also district boards or vestries in the metropolis having like powers, the only exception to this being section 4 of the Act, which deals with the "cleanliness and white-washing of workshops," where by sub section 4 it is stated that it does not apply to any "workshop" or "workplace" to which the Public Health (London) Act, 1891, applies. Under the Public Health Act, 1875, and the Factory and Workshop Act, 1878, local authorities are now charged with the duty of seeing that workshops generally (including workshops distinct from factories by the Factory Act, 1878, section 93) are kept in a healthy condition as regards cleanliness, ventilation, and overcrowding. Local authorities are also required to insure that every workshop under the Factory Act, 1878, and every "workplace" within the meaning of the Public Health Act, 1875, is kept free from effluvia arising from drains, closets, urinals, or other similar nuisances. Further powers are conferred upon the local authority by the new Act with reference to the necessary lime-whitening of workshops, as well as the right of entry and inspection, and taking legal proceedings. These powers of entry, &c., are additional to those which the local authority

* A paper read at the annual meeting of the Incorporated Association of Municipal and County Engineers & Bury, by H. PEECEY BOULNOIS, M.Inst.C.E., City Engineer of Liverpool.

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ties possess under the Public Health Act, 1875. Briefly, it may be said that as regards conditions of health, the control of workshops is now handed over from the inspectors of factories to the sanitary authorities. With regard, however, to both factories and workshops, an inspector of factories may prompt the sanitary authority to enforce the ordinary provisions of the law as to public health, and in default of their doing so, he may take proceedings himself, or he may enforce the sanitary provisions without notice to the sanitary authority in cases where he is specially authorised for the time by a Secretary of State. In any of the cases where the proceedings are successful he may recover all expenses from the sanitary authority. These summary powers as to factories and workshops apply also to laundries, which are now brought under the Factory Acts for the first time. The most important feature, however, of the new Act, so far as this Association is concerned, is the requirement as to "means of escape from factories in case of fire," contained in Section 7 of the Act. That section provides in effect that every new factory in which more than forty persons are employed shall have a certificate from the sanitary authority that it is provided with a "reasonable means of escape in case of fire," and that it shall be the duty of the authority to examine every such factory, and to give a certificate when satisfied that the required means of escape have been provided. With regard to the factories existing at the time of the commencement of this Act where more than forty persons are employed, the same section provides that it shall be the duty of the sanitary authority to ascertain whether all such factories are furnished with means of escape, and in the case of any factory not so provided, to serve on the owner a notice specifying what is necessary for that purpose and requiring him to carry out the work in a certain time. The principal points to be considered with reference to this section are:—(1) Who is the "owner"? (2) What is a "factory"? (3) Does the number of forty persons employed relate to the "entire factory," or only to that portion of it which requires "means of escape"? (4) Are the "means of escape" to be special in addition to the ordinary exits? The first point, as to who is the "owner"? is fairly well settled in the section itself. In subsection (2) he is described as the person within the meaning of the Public Health Act, 1875, the owner of the factory. The well-known definition in section 4 of the Public Health Act is sufficiently clear, as it states in effect that the owner is the person who receives, or who would receive, the rack-rent. (2) What is a factory? This can only be answered by reference to the Factory and Workshop Act, 1878, that being the principal Act to which the Factory and Workshop Act, 1891, is supplementary. Section 93 of the former Act contains a definition of "factory," which is long and intricate, and refers to schedule 4 of the Act, which is equally long and intricate. It is hardly possible to abbreviate that definition and to obtain precision in the explanation; but, in general terms, and subject to some extensions and limitations of meaning, a factory is a place where—(a) Mechanical power is used to work machinery in manufactures, or where (b) hand labour is employed in manufactures with mechanical power in aid. (3) Does the number of forty persons employed relate to the entire factory, or only to that portion of it which requires means of escape? On reference to the section it will be seen that the following words are used: "Every factory . . . in which more than forty persons are employed shall be provided on the stories above the ground-floor with . . . means of escape in case of fire for the persons employed therein," &c. It would seem, therefore, to follow, that in the case of a factory where, say, forty-five persons are employed, of which number only five are employed on the stories above the ground-floor, means of escape must be provided for the use of the five. It does not seem that it would be sufficient for the owner to contend that there are not more than forty persons employed above the ground-floor, or that to require provision perhaps of a costly nature for their safety is unreasonable. If more than forty persons are employed in the entire factory, means of escape must be provided for those persons (if any) however few, who are employed above the ground story. On the other hand, it seems clear that there is no power to require means of escape from the ground story,

or from stories below the ground story, although there are cases where such stories are specially liable to fire, and where the means of escape are inadequate, however many persons may be engaged at work in these stories. This appears to be a defect in the framing of the Act, but one which may not have been thought to be of sufficient importance to be dealt with. There is, however, a further defect of some importance which apparently might well have been met by special provision. It is as follows:—I have already pointed out that five or even a less number of persons working in an upper story must be provided with sufficient means of escape in case of fire when more than forty persons are employed in the entire factory, but in cases where twenty, thirty, or even forty (not more than forty) workpeople are altogether employed in upper stories, the factory being situated entirely above the ground-floor, the enactment does not apply. Such cases are not at all rare, especially in towns where the ground stories are occupied for shop purposes, often at high rentals, and the upper stories are used as factories. In every such instance the unfortunate persons in the factory at the top of the building (provided they do not exceed forty persons) receive no protection from the new Act, although in another factory a much lesser number of persons in the upper stories may receive adequate protection. (4) Are the means of escape to be special in addition to the ordinary exits? The section prescribes that the means of escape in case of fire shall be furnished on the stories above the ground-floor. The means of escape also are to be such as can reasonably be required under the circumstances of each case. It may, therefore, be fairly argued that in some cases the ordinary exits already provided from the upper stories would not be quite reasonably sufficient and yet may be capable of improvement so as to be better adapted for the purpose than any additional exit or exits could be made. Thus, a building of several stories in height above the ground having one long front to an open workyard, and practically no other front, may have a fireproof staircase external to the workrooms, placed in the middle of the front. Such a staircase may be the best kind of arrangement possible under the circumstances, and yet it may not be adequate for the egress of a large number of persons in a state of panic. In such a case it might be possible to improve the staircase sufficiently by widening the several doorways in it, or by altering the arrangement of the steps or landings, or by enlarging or inserting windows in it, so as to give the workpeople a better view of the open yard, and better means of escaping by the staircase. In such an instance the means of escape which could be "reasonably required" might not involve the provision of additional exits. Another instance may be that a staircase (even a fireproof staircase) is placed within the building, with its foot in the ground story at some distance from the outer walls. The various stories (including the ground story) may be liable to fire, and the workpeople in the upper stories may run the risk of being suffocated in this staircase, or being burnt in the ground story before they could reach the outer air. In an arrangement of that kind the means of escape which could be "reasonably required" would involve the provision of additional exits. It may, therefore, be concluded that the question, whether the means of escape are to be in addition to the ordinary exits, can only be answered with reference to the "circumstances of each case" taken by itself. Here we arrive at the main point in the administration of the Act as to "What is the best method of providing the required means of escape in the generality of cases?" I do not think we can take this to mean the "ideally" best method, or the best possible method of providing means of escape. The sanitary authority must be satisfied with such means of escape as can "reasonably be required." Now, I do not think it would be unreasonable in most cases to require that the persons employed in the building shall be able to readily escape from the room where fire has broken out into the open air at some level or other. This at least would prevent suffocation, and would allay panic. The best and easiest way of effecting this object would usually be to provide a strong balcony or flat roof (perhaps of concrete) at or near the level of the floor of the particular story in question; the balcony to be continuous throughout the length of the outer

wall on which it is fixed, not a mere balconette in front of each window. If possible, it would be a good arrangement to connect one or both ends of the balcony with a flat roof of a lower building. Egress from the workroom, or balcony, or flat, as the case may be, should be direct, and as easy as possible. It would be better that there should be no necessity to climb up on to a window-sill at a height of 3ft. or 4ft. above the level of the floor of the workroom, but a sufficient doorway should be provided in the usual way. The balcony should have a strong railing, about 4ft. in height. The persons in danger having escaped for the moment from the immediate presence of fire, some means of descent to the ground is necessary. To meet this need several patent arrangements of folding ladders or other apparatus, would be suggested for adoption, but it may be presumed that most responsible officials of sanitary authorities would not be content to allow that such precarious means of escape are reasonably sufficient. In some cases the balcony or flat may be connected with another building in the same occupation where there is no risk of fire, and where sufficient and easy means of egress may be had. But if descent from the balcony or flat can only be had by providing a fixed stair or step-ladder communicating with another balcony or flat at a lower level, it will, in my opinion, be "quite reasonable" to require such a provision, even if the stair has to be fixed on the outer face of a wall abutting on a public street. In that case it would be sufficient to make the stair or step-way wide enough for only one person to pass down at a time, and it may not be necessary to continue it to the level of the ground. The character of the balcony is a matter of some importance. A projection of 2ft. 6in. from the wall would be sufficient, and the width of any stair or step-ladder may be as little as 18in. in the clear. This will allow a space of 1ft. between the railing of the balcony and the rail at the head of the stair when the latter is placed close to the wall as it should be. If possible, the whole of the balconies and ladders should be of wrought iron, not of cast iron, which is treacherous even when first erected, and rapidly deteriorates by rust. As the persons who are affected by the new Act may be inclined to regard it as a somewhat unnecessary interference with their rights, it is as well to approach them in the first place in as considerate a manner as possible. Thus, it is well to issue a preliminary notice informing the owners and occupiers of the fact that a new enactment has come into force, which the local authority is bound to carry out. In connection with the issuing of such a notice I have found no difficulty, and have had many courteous replies thereto. Another good effect of the preliminary notice is that sometimes the occupier will write to say that the number of persons employed is less than forty, and the responsibility thus rests with him, if he has given wrong information. After making a sufficient inspection (which in many instances will require more than one visit), if the surveyor is convinced that sufficient means of escape have not been provided, he will find that the next proper step is to report the facts briefly to the local authority in order that they may instruct either their surveyor or clerk to issue a legal notice to the owners. This will necessarily be a strictly legal notice in which there will be no place for expressions of mere courtesy. It must specify the requirements of the authority for the purpose of carrying out the objects of the section, and will require careful consideration on the part of the surveyor in making his report to the authority, and the literal wording of his report should be followed as far as possible in the wording of the legal notice. The information given must be sufficient to enable the owner to hand it on to an architect or builder, who would thus be able to plan and execute the work. In this notice a date must be specified before which the measures necessary for providing the required means of escape must be carried out. The time should be sufficiently long to allow of the alterations being schemed and effected without undue haste, and during the course of the time specified it will naturally be prudent to inquire whether steps are being taken to comply with the notice, and in case of neglect to warn the owner that proceedings will follow after the term has expired if the neglect is continued. One of the most important practical points in the administration of this part of the Act is the granting of a certificate as to the suffi-

ciency of the means of escape from "factories" erected after the commencement of the Act. It will perhaps be best to make this document as brief and general in its terms as possible. It may be confined to a simple statement that the means of escape are sufficient and reasonable under the circumstances of the case, following closely the words of the Act. There is a somewhat remarkable omission from the section of any requirement of inspecting factories from time to time after the first inspection has been made, to ascertain whether they are provided with the means of escape mentioned in the Act for factories which are commenced to be erected after 1891. For those factories existing at the commencement of the Act provision is made for re-inspection. It is somewhat curious also to note that no certificate is required to be granted in the case of factories existing or begun to be erected before the commencement of the Act. The foregoing remarks as to notices and reports and the methods of improving the means of escape obviously relate to these existing factories. These are buildings that will give most trouble to the surveyor. But although the powers of the Act with regard to them are both comprehensive and strong, there is no obligation to grant a certificate. It is only with respect to new factories (i.e. those begun to be erected after the commencement of the Act) that a certificate is to be granted. The reason for this difference of treatment is not quite apparent, although there may have been good reasons in the minds of the framers of the Act. It would seem to follow that the granting of a certificate for an old factory would be *ultra vires*, and might be productive of more harm than good. Another puzzling anomaly of rather greater importance appears in the strange circumstance that whilst the authority must grant a certificate for every new theatre provided with sufficient means of escape, there does not seem to be any provision for making a renewed inspection of the building, or granting a renewed or amended certificate, or cancelling the original certificate, in the case of additions or alterations to the building. It is quite possible that the condition of things in the buildings may be so changed in course of time that the certificate may become untrue and worthless. But the powers of the local authority will have been exhausted, and so the object of the section will be defeated, at least with regard to new factories. This defect will probably be found to be a serious one requiring amendment, and it might be well for this Association to draw the attention of the Board of Trade to this serious omission.

AN ILLUSTRATED HISTORY OF FURNITURE.*

MR. FREDERICK LITCHFIELD has, for a moderate price, produced a copiously and well-illustrated volume descriptive of furniture from the earliest to the present time, handling his subject with no small degree of knowledge, and conspicuously so in a popular manner. In such a guide necessarily much of the familiar ground to the specialist has been gone over, and many examples previously depicted by other authorities are illustrated, some old friends from other books occasionally finding a place among the specimens herein grouped together in chronological order. The author acknowledges in the preface that his illustrations have been made from examples of established authenticity, and his endeavour has been made to produce a panorama which may prove acceptable to many, who, without wishing to study the subject deeply, may desire to gain some information with reference to it generally. The volume, which is well got up, and does good credit to the publishers, Messrs. Truslove and Shirley, will therefore interest a considerable class of readers, for most people nowadays take an intelligent pride in the fittings and furnishings of their homes, even when making but little claim to the merit, if so it may be called, of purity of style, or the harmonious character of all their furniture.

The archæology of the subject carries the student back to the gopher or cypress wood of the ark, and the Biblical account of the erection of the Tabernacle some 1500 years before Christ gives some idea of the skill acquired even at so early a date in the use of the several woods available, and the tools adapted for their employ-

ment. The existing remains of Assyrian and Egyptian furniture in the British Museum, to say nothing of the Greek and Roman designs on antique bronzes and paintings, furnish a considerable series of valuable instances of unquestioned authenticity, and thus on through the Middle Ages, when, as in all periods, the history furniture really becomes so entirely a part of the development of the manners and customs of the people, that to acquire a knowledge of the one necessitates, at any rate, some acquaintance of the other. Local influences, too, come in according to the materials available and the special tastes of the times, and combine in leaving indelible marks upon contemporary furniture, as upon other things, which is unmistakable. The historic chair of St. Peter, the Dagebert chair in the Musée de Souverains at Paris, and our own Coronation Chair at Westminster Abbey are all fairly early examples of very differing types. Mr. Litchfield furnishes drawings of these, with reproductions from Viollet le Duc's clever restorations, indicative of what he conceived the interiors and furniture of the Middle Ages to have been like. The miniatures also, which are here represented, serve the reader with some more reliable particulars. Of the furniture of the Renaissance, of course, a by far larger number of examples actually exists, more or less, all over Europe in churches, museums, and private collections. From this period and style, which includes a wonderfully diversified variety of design and workmanship, we illustrate some of Mr. Litchfield's instances, and in this way afford our subscribers with the best possible evidence of the worth of the book to which our references apply. The first of these specimens is a French Renaissance bedstead, once belonging to Jeanne d'Albert, mother of Henri Quatre, who was born at Paris in 1553. It belongs now to the National Collection, made by the French Government from various old palaces and chateaux. The rich, warm tint acquired by time has naturally added to the beauty of the work, and its carvings remain sharp and fairly perfect. The lines of the piece are somewhat severe, reminding us of the Earlier Gothic work in this respect as well as in some other particulars, such as the vertical panelling on all sides of the inclosure. The same feeling is observable in the Elizabethan wainscoting, which comes from a house in Exeter, though the detail is perhaps more refined in some of the ornamentation. The date assigned to this is 1550-75, and the specimen is now at South Kensington Museum, which collection includes a beautiful room from Sizergh Castle, Westmoreland, one of the most remarkable examples in existence. It should have been illustrated in this volume. We gave a drawing of it on April 24th, 1891. The Jacobean oak sideboard of William and Mary's time is very Dutch in its details, with its variety of panels to the drawer fronts in the main body. It is now at South Kensington. The "drawings" table is somewhat earlier in style, probably of Charles II. reign, with stained pearwood lines let into the oak, and acorn-shaped legs peculiar to the period. The contrivance of the "Drawings" table was invented in the days of Charles I. It consisted of an arrangement by which two flaps drew out, the one from either end, and by means of a wedged-shaped piece between, the centre or main table top was lowered, and the whole table, thus increased, became flush at one level. Mr. Litchfield follows up his chapter on Jacobean work with one on the Furniture of Eastern Countries, chiefly illustrating Japanese and Indian varieties. The French style naturally occupies considerable attention, with notices of Colbert, Lebrun, and Boule. Marqueterie and Lacquer work are subjects upon which Mr. Litchfield has a special knowledge, and the Jones collection at Kensington furnishes him with not a few of his best specimens. Chippendale and his contemporaries bring us down to our last illustration, which shows an uncommonly pretty satin-wood dressing-table with painted decorations, and dating probably from the end of the 18th century. At this time satinwood was introduced into England from the East Indies, and became very fashionable with medallions of figure subjects painted on. In this work such artists as Pergolesi, Cipriani, and Angelica Kaufman possibly found lucrative employment occasionally, when not engaged upon larger works, such as ceilings and frieze ornaments. Pugin's Gothic and the Early Victorian styles are represented, and the 1851 Exhibition is called under review with some strange productions by Hollands,

Jackson and Graham, and Crace. Some very good modern French pieces are also shown, but we cannot say that an adequate representation is made of English designers' work during the past twenty years. The Arts and Crafts exhibitions are named, and the Home Arts and Industries Association is mentioned with one example of that society's productions, viz., the "Ellesmere Cabinet"; but the work of such men as Norman Shaw and E. W. Godwin, W. Burges and Webb are passed by with only a tabulation of their names. Eden Nesfield, and some others who have done worthy work in this connection, are not even spoken of—Talbert, for example. We have thus glanced through the volume with our readers, and can conclude by saying that they will find it quite worthy of the estimate indicated by the opening paragraph with which we commenced this review.

OBITUARY.

THE profession of architecture in Montreal has suffered a serious loss in the death of Mr. W. T. Thomas. Mr. Thomas was one of the best known architects in Canada, and still in the prime of his usefulness, being only 64 years old at the time of his death. His death will be much felt in Montreal.

The death of Mr. Thomas William Helliwell, patent glazing manufacturer, Brighouse, took place on Tuesday very suddenly. When quite a young man, Mr. Helliwell commenced business as an architect in Brighouse and Huddersfield, and soon acquired an extensive connection. Subsequently he brought out a patent for an improved system of glazing, which he largely developed, and in connection with which he established a wide and extensive home and foreign connection. He formerly lived at Thorpe Green Hall, near York, but some time ago again took up his residence at Raistrick.

Mr. William Cheiaka, for many years the county surveyor of Herefordshire, a post from which he retired a few months since on account of ill-health and advancing years, died on Monday at his residence, Pen-y-Bryn, Hafod-road, Hereford. He was 63 years of age.

Edwin H. Wootton, asphalt manufacturer, of Broadway and Lexington-avenue, New York, died at Saratoga recently from a complication of diseases. Mr. Wootton was born in England in 1835, in the neighbourhood of Canterbury, and when 17 years old went to New York, with the interests of which city he has been identified for forty years. He started in the house of A. T. Stewart and Co., and afterwards was a partner of a flour-mill business. The firm having decided to close up their business, Mr. Wootton purchased in 1874, from the assignees of a defunct asphalt company, their plants and properties, and shortly after he was appointed sole agent in the United States and Canada of the Compagnie Générale des Asphaltes de France. Mr. Wootton was a member of the Engineers' Club, and popular amongst engineers and architects, being regarded by many as the highest authority in the United States on the uses of rock asphalt. He leaves a widow, two sons (the younger being engaged in his father's business), and an unmarried daughter.

CHIPS.

Mr. A. P. J. Cotterell has been instructed to thoroughly overhaul and reorganise the drainage of the Clergy Daughters' School, Bristol.

At a vestry meeting held at Oundle last week, it was decided to proceed with the first portion of the restoration of the church, in accordance with the report prepared by Mr. J. T. Micklethwaite, F.S.A. The present work is the recovering of the roof, and will cost £450.

Major-General H. D. Crozier, R.E., and Mr. Thomas W. Thompson, of the medical department of the Local Government Board, attended at St. George's Hall on Friday, and held an inquiry with regard to the application of the Toxteth Local Board to borrow £5,700 for the construction of a refuse destructor, £6,400 for works of sewage and street improvements, £4,900 for additions to the hospital, and £400 for a public mortuary.

The local board of Gorton, near Manchester, have adopted a scheme of sewage purification and drainage prepared by Messrs. Lomax and Lomax, of Manchester and Bolton. The estimated cost is £23,905.

* An Illustrated History of Furniture from the Earliest to the Present Time. By FREDERICK LITCHFIELD. London: Truslove and Shirley, 143, Oxford-street, W. 1892.

CONTENTS.

Pitfalls of Practice...	167
By-Laws and "Jerry" Builders ...	167
Theatres.—III. ...	168
Shadows in Perspective.—IV. ...	170
Prices.—XLII. ...	171
Notes on the Factory and Workshop Act, 1891, 54 and 55 Vic. cap. 75 ...	172
An Illustrated History of Furniture ...	174
Obituary ...	174
The Building News Directory ...	175
Our Illustrations ...	175
Wayside Notes ...	194
Convalescent Home for Cornwall ...	194
A Village Institute ...	195
Theatre Regulations in New York ...	195
The British Association at Edinburgh ...	196
Competitions ...	196
Building Intelligence ...	196
Engineering Notes ...	197
Correspondence ...	197
Legal ...	198
Legal Intelligence ...	198
Water Supply and Sanitary Matters ...	198
Our Office Table ...	199
Trade News ...	199
Tenders ...	199

ILLUSTRATIONS.

YORKSHIRE PENNY BANK.—ST. AUGUSTINE'S CHURCH, TONGE MOOR.—NEWCASTLE-ON-TYNE CITY LUNATIC ASYLUM.—SUGGESTIVE DOMESTIC WORK IN STONE.—A VILLAGE INSTITUTE.—RENAISSANCE FURNITURE.

Our Illustrations.

YORKSHIRE PENNY BANK, BRADFORD.

THESE buildings are now in course of erection on a prominent site at the junction of North-parade and Manor-row, and are being erected of local stone. The architect is Mr. Jas. Ledingham, F.R.I.B.A., Bradford. Our illustration is reproduced from a drawing exhibited in the recent Royal Academy.

ST. AUGUSTINE'S CHURCH, TONGE MOOR.

THIS church, which has been recently erected, is situated in a thickly-populated township on the outskirts of Bolton-le-Moors, and will accommodate about 600 people. It has been built from the designs, and under the supervision, of Mr. R. Knill Freeman, F.R.I.B.A., of Bolton and Manchester, the materials employed being Yorkshire stone parpontos, with red Rainhill stone dressings, the internal dressings also being in red Rainhill stone. The chancel is lofty, of good proportion, and well elevated, the vestries, &c., being placed underneath, while the principal entrance has been placed at the north-west end. An organ-loft is provided over the north chancel aisle; the nave is wide, and the aisles, separated from it by arcades, are used as passages only. The style is Late Decorated, and the general contractors for the works were Messrs. Woods and Son, of Bootle, near Liverpool.

CONSLIDGE ASYLUM EXTENSION, NEWCASTLE-ON-TYNE.—SELECTED DESIGN.

THE ground plan and views we give are of the design placed first by Mr. George T. Hine, F.R.I.B.A., the assessor in the recent competition for the extension of the asylum for the city and county of Newcastle-on-Tyne. The present buildings, which accommodate over 400, will be adapted for female patients, and the extension will be devoted entirely for male patients. The accommodation is as follows:—Recent, 29; sick and infirm, 50; epileptics, 57; acute, 32; convalescents, 29; chronic and working, 152; total, 349. The chapel and recreation hall are placed between the existing and proposed buildings, to be used for both. An isolation hospital for 10 patients will be erected to the north of the asylum, and have a separate administrative department. A new residence for the medical superintendent will be placed to the south, quite clear of the asylum buildings. There will also be a new entrance lodge, and 10 semi-detached cottages for attendants. The whole of the buildings will be erected of stone, and covered with best Bangor slates. The floors and the ceiling of the upper story will be of fireproof construction. The woodwork will be of pitchpine and yellow pine. The lavatories, bathrooms, and closet annexes will be faced internally with

glazed bricks. The staircases will all be of fireproof construction, and outside the closet annexes there will be iron escape stairs. The heating and ventilation will be by a system of propulsion. The air forced through trunks underground, passed through batteries of steam-coils at the entrance to each block, and admitted at the upper part of the rooms. The vitiated air will be taken out at the floor level into trunks communicating with shafts carried up in the well of staircases. A fire main service will be laid inside and outside the buildings, and hydrants placed in the lobby to each closet-annexe. The estimated cost of the buildings, forming roads, and airing-courts is between £70,000 and £80,000. This does not include the cost of alterations to the existing buildings. Operations will be commenced as early as practicable. Mr. John W. Dyson, M.S.A., of Newcastle-on-Tyne, is the architect.

SUGGESTIVE DOMESTIC WORK IN STONE.

THESE old houses, located in four different counties where stone is abundant, represent in a typical way the natural and simply artistic use of the material most ready to hand. In neither of them is displayed a needless effort after mere prettiness or meretricious effect so often conspicuous in work of the present day, for their builders seem to have depended entirely on the practical requirements of the buildings which they had to design for the architectural character which they so admirably obtained. It is, of course, true that no small degree of the artistic quality belonging to these old houses comes of the mellowness given by time, which alone can impart the exquisite tones and tints so dear to all who have any appreciation for colour and harmony of shade. But, on the other hand, it is scarcely possible to conceive that at any period of their history these buildings could have looked really hard and mechanical in the way which characterises most of the more ambitious productions of more recent years. Nowadays economy of space and material necessarily press more uncompromisingly upon the architect, who no doubt often is limited by conditions unknown to the designers of such historic examples as these sketches represent. Restricted frontages, the requirements for lofty rooms with unbroken ceilings, and the utmost amount of light for every part of the interior of the dwelling, wherein every inch of room is required to be made available for use. These are difficulties of which every planner knows full well the reality, though very few possess the ability to overcome, or perhaps take the trouble to meet, such problems thus presented in the same way in which the old builders evidently would have done. How to successfully solve such demands upon the architect's skill, both artistically and practically, can only be really acquired by a study and intimate acquaintance of works by the best masters of the past, so that by realising the relative values of solid and void, the sense of good proportion, the need of good detail, and, above all, a well-conceived skyline, the spirit of true architectural merit may be imparted to our buildings without any real sacrifice of their utility and reasonable inexpensiveness. Viewed in this sense, the studies which our accompanying sheet presents really do afford suggestive examples at once entirely natural in style and unambitious in aim. Take, for instance, the little manor house at Water Eaton, near Oxford, and mark the dignified character of its plan with the two smaller buildings on either side of the quadrangle, which is further enhanced by the small church or chapel adjoining. This latter, for the purposes now in mind, may be taken as merely an accessory not always possible. The dwelling, placed in the midst of a farm holding, has practically unlimited surroundings of meadow land and fields, unmarked by special features. Without some sort of rigid inclosure, the house would be devoid of that cosiness and sense of retreat so essential to the character of home. The builder, therefore, not attempting to vie with nature, adopted a simple contrast to its charms by building a small quad, and in front erected piers between which open-work timber gates are hung, and a paling fence by which the view is enhanced rather than obscured. Here the good taste of the time prescribed a little formal garden with its straight walks and Old English flower-beds set out in a pattern, like the façade of the house to which such a garden more immediately belongs. Turning into the building, the common living-room, still known as the hall, occupies the

leading position, placed so as to emphasise the elevation as well as the plan. The withdrawing room is more out of the way on the other side of the entry, and bears a proportionate recognition in the treatment of the façade. The house is fairly well kept as a farmhouse, but the forecourt is now entirely covered with grass, and so the main idea of the original builder has been quite lost sight of. South Wraxall Manor is a much larger and more important place, of course, quite famous among the Domestic architecture of England. Whole pages might be written about it. For the limit of these notes, however, to-day, the possibility which the building displays for the introduction of big windows may be mentioned; in fact, the end of the drawing-room is practically all glass, almost enough for a Strand shopkeeper's window, and yet the effect is reposeful and admirable. The quadrangle which this window commands was no doubt once set out as a garden, such as that already referred to as at Water Eaton. The doorway to the right of the sketch leads to the big hall of the house, which runs the whole height, and has an open-timbered roof and a great screen with a minstrels' gallery over it. Haddon Hall needs no description, as everyone knows the celebrated Derbyshire home of the Vernons. This side of the lower quadrangle here sketched has not been so often illustrated as other parts of the building. The value of breadth in plain walling is here the suggestive note, and the small, simple bay windows leave nothing to be desired in the way of correct proportion. Of the almshouses at Marshfield, an out-of-the-way picturesque village with one long, quaint thoroughfare overlooking the Bath country from the verge of the Gloucestershire hills, are exactly what they were intended to be—a row of dwellings for aged villagers by the roadside in continuation of their old street. The inclosing wall protects the inmates from intrusion, and the gateway adds dignity without undue ambition. The porch and gable over it, enriched with an heraldic panel, lead up to the clock-turret, which is of great value in the composition without competing with the parish church tower, for that is at the other end of the village. Each dwelling has a dormer of its own breaking the eaves pleasantly, and all seems well in scale, which observation affords a suggestive note worth something, while our designs fail, perhaps, in this respect more than in any other. Further drawings of South Wraxall Manor, with plans of the house, will be found in the BUILDING NEWS for Aug. 12 and 19, 1887, and others of Haddon Hall in our issues for April 2 and 16, 1875; April 2, 1878; July 6 and Oct. 5, 1883; July 11, 1884; Aug. 17 and 24, 1888; with descriptions in all cases. The other examples have not before been illustrated in the BUILDING NEWS.

M. B. A.

AN ILLUSTRATED HISTORY OF FURNITURE.

SEE description on p. 174, with our review of Mr. Fredk. Litchfield's new book on this subject.

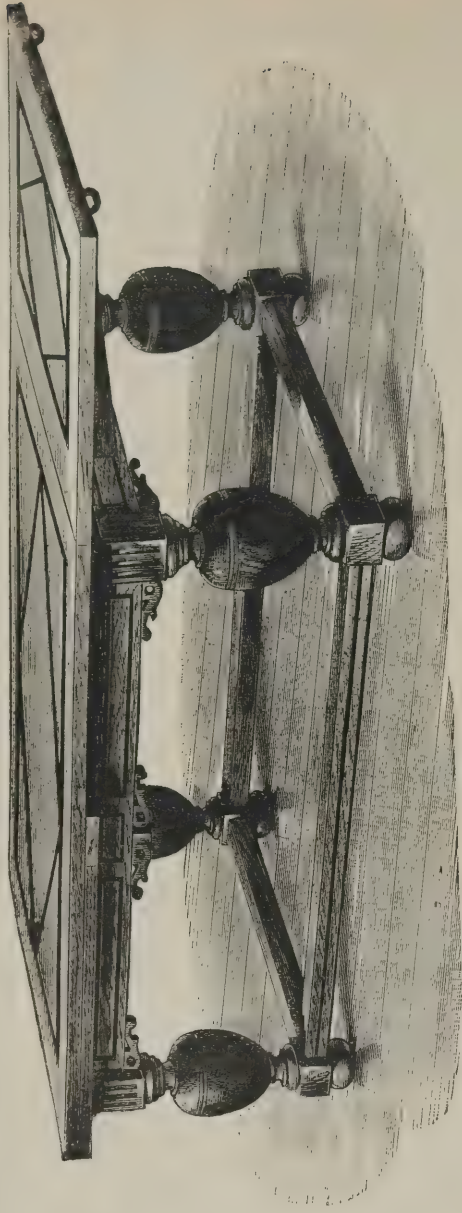
CHIPS.

THE death of John Taylor, R.C.A., landscape painter, occurred on Thursday, the 29th ult., near Llanbedr, in the Conway Valley. The deceased was a native of Manchester, and besides being a member and regular exhibitor of the Cambrian Academy at Plas Mawr he was also an associate of the Manchester Academy, to which institution he was a frequent contributor.

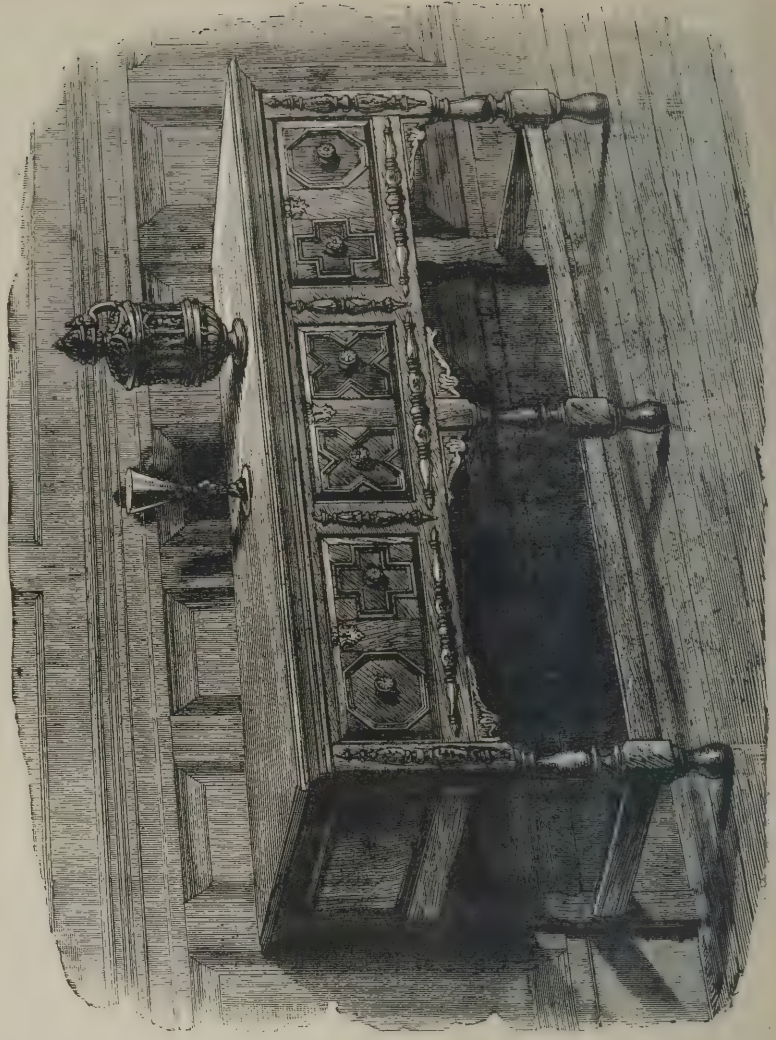
Major-General Crozier, R.E., an inspector of the Local Government Board, held an inquiry at Rugby on Friday with regard to the local board's proposal to borrow £5,000 for the extension of the cattle market at Rugby, and £1,100 for the purchase of a site in the parish of Bilton for the erection of a hospital for infectious diseases.

The design sent out by Mr. George Wade, London, in competition with many others, has been chosen for a bronze statue to be erected in Hamilton, Canada, of the late Sir John Macdonald. The marble memorial which he has now completed of the same distinguished statesman has been unveiled in St. Paul's Cathedral, London, this week.

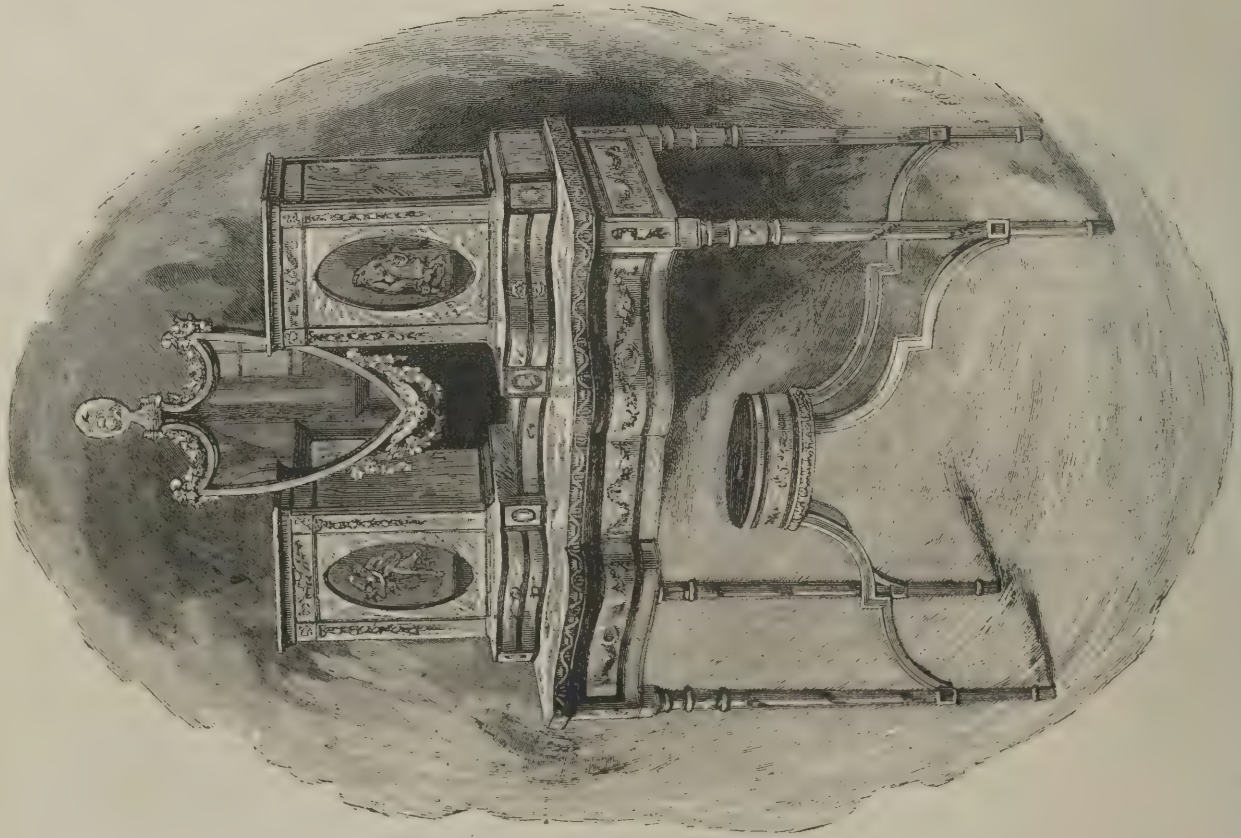
Nearly two years ago the experiment of painting and gilding the interior of the choir of St. Paul's Cathedral was commenced under the direction of a large committee appointed by the Dean and Chapter. It is now announced that, by the advice of Sir Frederick Leighton, P.R.A., and Mr. W. B. Richmond, R.A., the experiment will be abandoned and the walls restored to their original appearance. The architects, Messrs. Bodley and Garner, have concurred in the discontinuance of the work.



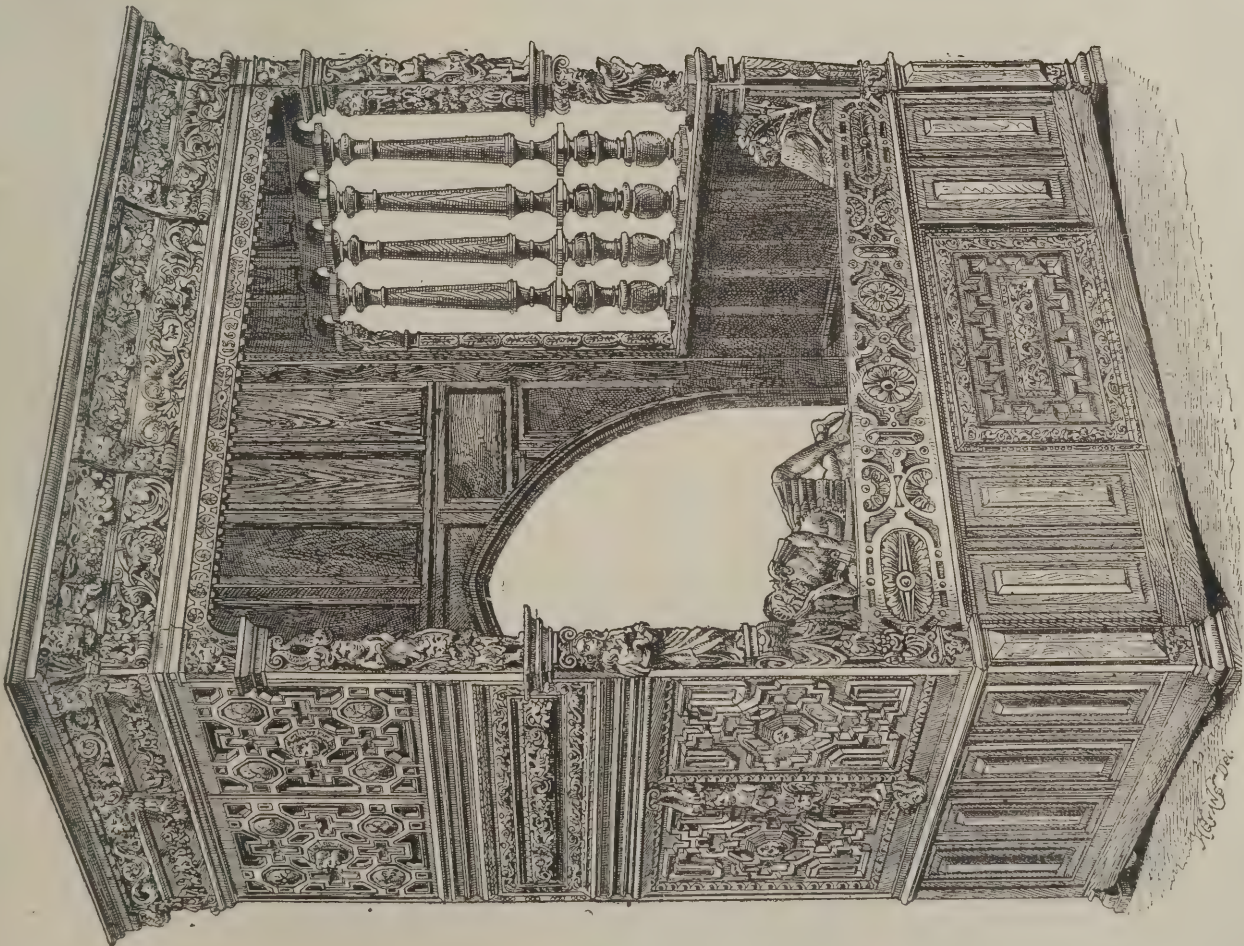
CHARLES II. "DRAWING" TABLE.



WILLIAM AND MARY OAK SIDEBOARD, KENSINGTON.



ENGLISH SATINWOOD DRESSING TABLE WITH PAINTED DECORATION.—
END OF EIGHTEENTH CENTURY.



CARVED OAK BEDSTEAD OF JEANNE D'ALBERT, 1562,



OLD WAINSCOTING FROM HOUSE IN EXETER, 1550-75.

WAYSIDE NOTES.

SOMEONE has been saying things derogatory to the artistic reputation of the students at South Kensington, and Messrs. Buckmaster, Preston, and Alexander Wood have made replies in their behalf. It having been reported that the South Kensington students were not so successful in the examination this year as heretofore, the statement has been refuted, and a position in the national competition claimed as distinctly the highest. It would certainly be a great disgrace if students at headquarters did not maintain a premier place in the yearly trial of skill. The large towns may prove powerful competitors, but they should scarcely be able to render a better account of themselves. The *Standard* correspondents say that the South Kensington students have gained five gold medals out of twelve, twenty silver medals out of sixty-seven, fifty-four bronze medals out of one hundred and eighty-nine, and a large proportion of the whole number of book prizes. In a word, the six hundred and forty S.K. students have secured more than one-fourth of the total awards competed for in the United Kingdom. This looks well enough, certainly; and if the real artistic work is in true proportion to the prizes, there should be nothing about which critics can complain. The students may be said to have cleared themselves of the charges made, and that without the help of the Departmental authorities and administrators. It only remains for us to recommend that they strive arduously in future years to further establish their pre-eminence.

Another R.A. exhibition has been brought to a conclusion. I was at the galleries on Saturday, and spent some time in the architectural room before the end of the show. It occurred to me that if the ordinary frequenter of the Royal Academy Galleries took any interest whatever in the architectural room, then assuredly would the question be frequently put, "Do architects ever make their own drawings?" The number of "perspectives" in this year's exhibition bearing a name other than that of the architect of the work is more noticeable than ever. One of the discoveries of this generation of architects has been that the same design drawn by different hands may look good, bad, or indifferent, according to the skill of the draughtsman; and further enlightenment in the same direction has proved that, in the hands of an artist, a positively repulsive design may be made to appear not merely inoffensive, but actually pleasing. Touch, light and shade, and a wary omission of undesirable and awkward features work wonders.

To architects the exhibition loses much of its interest from this cause. The great pleasure of seeing a design drawn by the architect's own hand is gone. Surely, if Mr. Waterhouse can find time and opportunity to prepare a perspective drawing for the exhibition, other less employed architects can do the same. Evidently it is not a matter of time or opportunity at all, but simply a knowledge of the value of the services of a fashionable architectural perspective-maker. It is probable that if the selection of the drawings to be hung in the architectural room were in the hands of a committee of architects of whom the profession would approve, much of this evil would disappear. What we all like to see is the handiwork of the man, and not somebody else's idea of the completed building. A thumbnail sketch by an able architect is in such cases of far higher interest than an elaborated representation by another hand. If things were as they should be, a rough sketch on a scrap of paper would have more chance of acceptance at Burlington House than the most elaborate and highly-finished "perspective"—vile word.

Attempts to upset awards, elections, and the like, do not afford any attraction to me, and I am therefore glad to see that the A.A. committee remain as heretofore. If Mr. Gerald Horsley has been badly treated, let justice be done; but to say that because of this the whole committee shall be re-elected, is an argument not to be supported by logical reasoning. Ends in view other than the mere righting of an injustice are discernible. Let the present committee as duly elected by a majority of members continue in peace to enjoy their tenure of office. Those inclined to revolutionary ideas had best take a holiday and endeavour to come to a different

frame of mind. Try sketching and measuring Early English mouldings.

On Monday a poll-tax upon passengers passing between Dover and Calais was instituted for the purposes of raising money for the construction of the new harbour at Dover. At a tax of 1s. per head, it is estimated that a revenue of about £14,000 a year will be gained. The tax may be good or not, but the proposed harbour is decidedly good. Dover—so I have heard—is a nasty place to get into in dirty weather, excepting to those navigators accustomed to daily passing in and out of the harbour. The captain of an Atlantic liner may not be competent to take a penny steambot from London-bridge pier to the Surrey side with a strong tide setting down the river. So I should imagine it is also something of the nature of a trick gained only by constant practice to "make" certain harbours on our coasts; and if Dover is to be improved in this respect, many skippers will be glad.

I hear of a "moving roadway" as a proposed feature for the Paris Exhibition of 1900 A.D. By that date we might have such things as practical and ordinary adjuncts to City life, and one would step on at the Bank and in due course arrive at the Strand. Why, if I am rightly informed, a travelling sidewalk has been arranged for the Chicago "Exposition"! At the charmingly situated Inversnaid Hotel at Loch Lomond, I met a clergyman from Frisco, who explained the whole thing. There are to be three divisions of this travelling side-walk. The first is to move very slowly, and the two others at increased speeds. Thus, apparently, one may stand quite still and yet see all the fun of the fair.

The proposed "moving road" for Paris would commence at the Arc de Triomphe and carry the visitor past the Neuilly Bridge to the Exhibition. The "roadway" would be divided into three longitudinal sections, one for direct transport, one for a return journey, and the third for enabling the "passenger" to visit the restaurants, &c., on the route. The entire breadth of the Avenue de Neuilly would, it is said, be occupied. The idea is evidently taken from the travelling footway that is to be a feature at Chicago next year, as above described.

There is something pitiable about the fearful ignorance of the Russian peasantry with respect to the uses of disinfectants for the cholera epidemic. It passes our comprehension to understand a state of things where a people will break out in revolt against sanitary measures of a necessary kind. Yet only a few days ago at Tashkend, the capital of Russian Turkestan, a riot occurred in which some 65 persons were killed and over 100 wounded. To spread about a disinfectant evidently gives persons of such low intelligence the idea that the authorities are poisoning them. Tashkend is not, properly speaking, Russian, and the Tarts are evidently a rough, uncivilised community; but much the same antipathy to sanitary measures appears to be rife in other and more purely Russian districts.

It may be that the solution of the difficulty with regard to the high cost of electric lighting as compared with gas is to be found in municipal or parochial installations. The parish of Islington, encouraged by the successful example of St. Pancras, is about to make an experiment in this direction. St. Pancras has managed to make a small profit with its electric lighting, which is a great thing, and likely to influence many of the Metropolitan vestries in the question of lighting. The charge contemplated by the Islington vestry is 6d. per unit—rather a vague quantity to such of us as have not been "consumers" of electricity for lighting purposes, but one which we shall hope will compare favourably with gas. The high price of the electric light has lately been the great obstacle to progress; but it may be that where companies do not answer, municipal authorities may succeed.

GOTH.

The memorial stones of a mission hall were laid in Rochester-street, at the rear of Brighton College, by the Mayor of Brighton, on Friday. The building is of red brick, will measure 56ft. by 23ft., and will accommodate nearly 300 people. Mr. W. H. Nash is the architect and Mr. G. R. Lockyer the builder.

CONVALESCENT HOME FOR CORNWALL.

THE Convalescent Home which Mr. Passmore Edwards, of London, the proprietor of the *Echo*, the *Weekly Times* and *Echo*, and the *Building News*, has given to the county of Cornwall, was formally opened on Monday at Perranporth, near the village of Blackwater, where Mr. Passmore Edwards was born, and where lived the mother to whose memory he has erected this Home. The Home is a substantial and very nice-looking erection, standing in a considerable plot of land capable of being laid out to considerable advantage as pleasure grounds. Built of a bluish local stone with granite and brick facings, the Home was designed by Mr. John Symons, of Blackwater, and built by Messrs. John Symons and Son. Some amount of excavation was necessary at the back of the building, which occupies ground about 60ft. square, consists of ground floor, first floor, and attics, with a splendid balcony 23ft. by 16ft., fronted by an iron palisading, and with the name "Convalescent Home" cut upon a granite course below it, in the centre of the façade. On the ground floor are the library and reading-room, day-room, and dining-room, all in front, with the kitchen communicating the dining-room, matron's room, and other most convenient rooms and offices upon the other side of the main corridor. The twenty beds for patients are mostly upon the first floor, fine, lofty, well-lighted rooms, approached by a wide staircase with a pretty pitch-pine balustrade. There are other conveniences, such as linen closets heated by hot air, and altogether the establishment is in every detail complete. Mr. Passmore Edwards has bought the ground, erected the building, furnished it, hung the walls with pictures, and provided a library. Some of the larger furniture, dressers, and cupboards and tables, have been made by the builders, Messrs. John Symons and Sons. The rest of the furniture was supplied by Messrs. Criddle and Smith, of Truro.

CHIPS.

The new Roman Catholic church, dedicated to St. Martin, at Trant, N.B., was opened for worship last week. The church has been built from designs prepared by the late Mr. J. Biggar, architect. It is a simple Gothic structure, consisting of nave and chancel, and seated for 420 persons. The altar is constructed of white Seaton stone, elaborately carved, with shafts of alabaster supporting the altar-table, a crocketed canopy over the tabernacle, and statues of St. Martin, St. Margaret, St. Andrew, St. Patrick, St. Bridget, and St. Columba set in canopied niches. Together with the chapel-house which adjoins it, the church has cost £2,000.

The freehold of Barnard's Inn has been sold to the Mercers' Company for the purpose of transferring their school from College-hill to a more extensive building to be erected on the site, the area of which is 28,000ft.

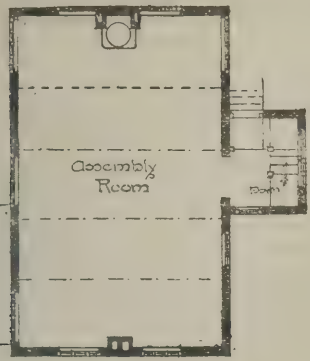
The annual congress of the Cambrian Archaeological Society will open at Llandello on Monday next.

St. John's Church, Gannow, near Burnley, has been reopened after being completed at a cost of £4,500, which has been met by Sir John H. Thursby. The church, as now completed, has cost over £13,000.

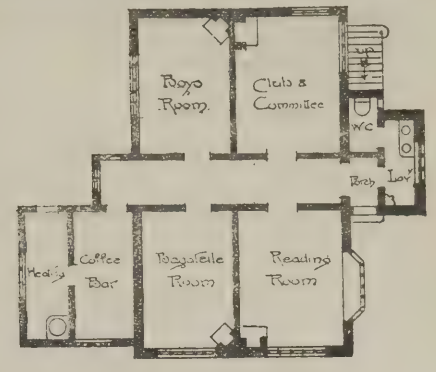
A series of pictures, 24 in number, are to be placed in the ambulatory of the London Royal Exchange, the subjects to represent scenes in the history of the City. A list of well-known artists is to be drawn up, and a subject allotted to each. Sir Frederick Leighton has offered to execute one of the designs on a panel, and present it as a gift; and Mr. Deputy Snowdon has undertaken to present another picture, the subject chosen by him being the opening of the present Royal Exchange by the Queen in 1842.

The new chapel at the union workhouse at Oundle, erected at a cost of over £1,000, was recently dedicated by the Bishop of Peterborough. A large quantity of Weldon stone was given by Earl Winchelsea, while the expense of building has been met by voluntary effort. Messrs. W. Bucknel and J. N. Cooper, of Westminster, were the architects, and Mr. J. W. Ireson, of Oundle, the builder.

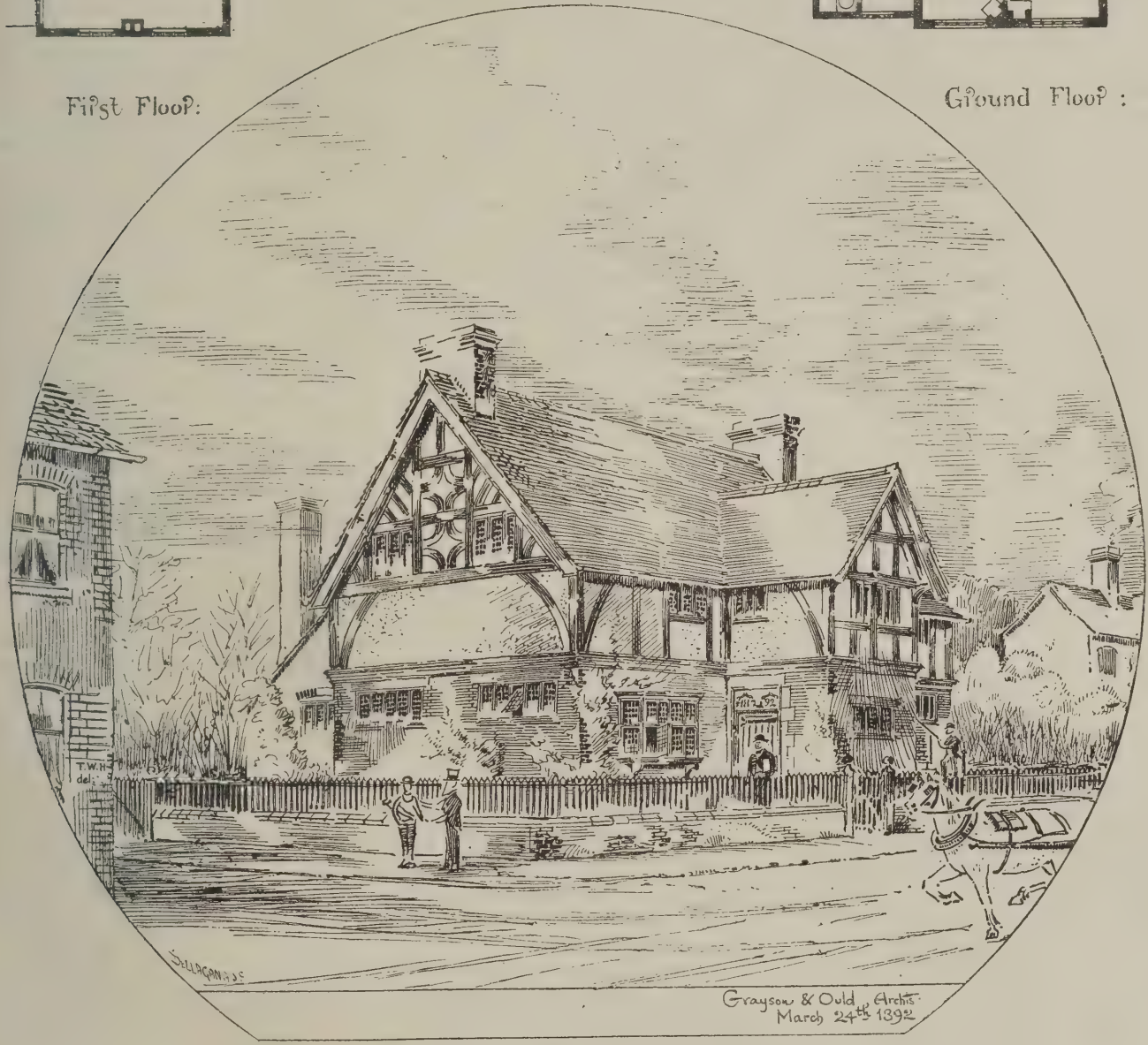
A stained-glass window has been placed in St. Margaret's Church, Westminster, in memory of the late Sir Goldsworthy Gurney, C.E., the ventilating engineer of the Houses of Parliament, and the inventor of the Bude light and of flashing signals. The window was designed by Mr. Edward Frampton, and was unveiled on the 28th ult. by the Duke of Wellington.



First Floor:



Ground Floor:



A VILLAGE INSTITUTE.

A VILLAGE INSTITUTE.

THIS is a design for a Workman's Institute for a village in the Midland Counties. The design being carried out is a modification of the drawing. Messrs. Grayson and Ould, of 31, James-street, Liverpool, are the architects.

THEATRE REGULATIONS IN NEW YORK.

THE New York Building Act lately passed prescribes various rules for the construction of theatres in that city. One of these is that every building shall have at least one front to the street with means of entrance and exit. There is to be also reserved for service in case of emergency an open court or space on the side not bordering on the street where said building is

located on a corner lot, and on both sides where there is but one frontage to the street. The width of such open court or courts is not to be less than 7ft. where the seating capacity is not over 1,000; above 1,000 and not more than 1,800 people, 8ft. in width; and above 1,800, 10ft. in width. These courts are to begin at or near the proscenium wall, and extend the length of auditorium, and to have separate corridors to the street through any superstructure that may be built on the street side of auditorium. The corridor walls and ceiling to be fireproof. Exits are to be at least 5ft. in width, and have doors of iron or wood of certain construction. These doors are to be open outwards, and be fastened with movable bolts, drawn during performances. Balconies not less than 4ft. wide are to be provided in the courts at each level or tier above the parquet on each side of auditorium of sufficient length to embrace the two exits, and from the

balconies staircases shall extend to the ground level, with a rise of not over 8in. to a step, and not less than 9in. tread. That from the upper balcony to the next below is not to be less than 30in. in width in clear, and from the first balcony to ground 3ft. in clear when the seating capacity of auditorium is for 1,000 or less; 3ft. 6in. in clear when 1,000 and not more than 1,800 people; and 4ft. in clear when above 1,800 people and not more than 2,500 people; and not over 4ft. 6in. wide when above 2,500. These balconies and staircases are to be constructed of iron throughout, and they shall be covered with a metal hood. Where one side of building borders on a street, there are to be balconies and staircases of like capacity and kind carried to the ground. It is permitted to construct a roof-garden, art gallery, or other rooms above a theatre, provided the floor between be constructed of iron or steel and fire-

proof materials. The other provisions relate to the proscenium opening—fireproof curtain of metal or asbestos, &c.

THE BRITISH ASSOCIATION AT EDINBURGH.

A CENTURY OF PROGRESS IN GEOLOGICAL SCIENCE.

THE sixty-second meeting of the British Association was opened on Wednesday by an address from the president, Sir Archibald Geikie, the Director-General of the Geological Survey of the United Kingdom, who took as his text the progress made in geological science during the 100 years that have elapsed since James Hutton published in that city his "Theory of the Earth." Hutton's theory, that the changes and decay now in progress on the earth's surface afford an explanation of those which must have occurred in earlier times, was elucidated and expounded by his friend, Playfair, and by slow degrees the public learned to extend the time to be granted for the development of Nature's operations on the surface of the globe. In the course of an interesting address, couched in lucid and popular terms, Sir Archibald sketched the quarrels between the followers of Hutton and Werner, the Plutonists and Neptunists, as they were dubbed, from the relative stress they laid on the agents of subterranean heat and of rainfall, the effects of the observations and generalisations as to stratified rocks by William Smith, and then the manner in which William Thomson (now Lord Kelvin) aroused men from the intellectual torpor into which a belief in the extreme theory of uniformitarianism had lulled them by demonstrating that the whole evolution of the earth had been comprised within certain definite limits. Modern investigation had still further reduced the limit of time given by Lord Kelvin for the earth's age, from a hundred million years to twenty, or possibly, as Tait urged, even ten million years. Sir Archibald next described in picturesque language the transformation which overspread the earth during the Ice Age, when the glaciers of the Arctic regions crept southward over Europe, extirpating the lions, hyenas, and hippopotami, replacing them by the reindeer, woolly rhinoceros, and mammoth, and showed how the evidence of successive races of plants and animals, taken in conjunction with the imperceptible development of type in flower, bird, mammal, or human race during the four or five thousand years that have elapsed since the earliest men lived in Egypt, conclusively proved the long period that must on any hypothesis be given to the duration of life on this globe. Sir Archibald closed with the following geological retrospect:—

If, standing on the Castle Rock, the central and oldest site in Edinburgh, we allow the bodily eye to wander over the fair landscape, and the mental vision to range through the long vista of earlier landscapes which science here reveals to us, what a strange series of pictures passes before our gaze! The busy streets of to-day seem to fade away into the mingled copsewood and forest of prehistoric time. Lakes that have long since vanished gleam through the woodlands, and a rude canoe pushing from the shore startles the red deer that has come to drink. While we look, the picture changes to a Polar scene, with bushes of stunted Arctic willow and birch, among which herds of reindeer browse and the huge mammoth makes his home. Thick sheets of snow are draped all over the hills around, and far to the north-west the distant gleam of glaciers and snow-fields marks the line of the Highland mountains. As we muse on this strange contrast of the living world of to-day the scene appears to be more Arctic in aspect, until every hill is buried under one vast sheet of ice, 2,000ft. or more in thickness, which fills up the whole midland valley of Scotland and creeps slowly eastward into the basin of the North Sea. Here the curtain drops upon our moving pageant, for in the geological record of this part of the country an enormous gap occurs before the coming of the Ice Age. When once more the spectacle resumes its movement the scene is found to have utterly changed. The familiar hills and valleys of the Lothians have disappeared. Dense jungles of a strange vegetation—tall reeds, club-mosses, and tree-ferns—spread over the steaming swamp that stretch for leagues in all directions. Broad lagoons and open seas are dotted with little volcanic cones which throw out their streams of lava and showers of ashes. Beyond these, in dimmer outline, and older in date, we descry a wide lake or inland sea, covering the whole midland valley, and marked with long lines of active volcanoes, some of them several thousand feet in height. And still further and fainter over the same region, we may catch a

glimpse of that still earlier expanse of sea which in Silurian times overspread most of Britain. But beyond this scene our vision fails. We have reached the limit across which no geological evidence exists to lead the imagination into the primeval darkness beyond.

The full text of the address will be found in to-day's issue of the *English Mechanic and World of Science*.

COMPETITIONS.

WALSALL.—The preliminary competition of plans for the town hall at Walsall is decided. The committee, after careful consideration of 39 designs sent in, have awarded the two premiums as follows:—1st, Mr. John R. Withers, Shrewsbury; 2nd, Mr. Daniel Arkell, Birmingham. The official report says:—"As from the designs sent in it is clear that a hall sufficient to meet the requirements of the town can be erected on the suggested site, it is the intention of the committee to recommend the council to offer in competition three premiums of 100, 75, and £0 guineas respectively for complete designs, including specification and estimate of cost. If this recommendation is adopted, notice of the competition will be given in due course. In coming to a decision on any new designs which may be submitted, the committee will not be fettered in any way by those which have been awarded the premiums in the preliminary competition, which was for the purpose of ascertaining the maximum accommodation which could be obtained on the site." No professional referee other than the town surveyor was employed to assist in the above award and no one was allowed to see the plans, so that it is by no means certain that the best designs were premiated. If the competition as above foreshadowed is adopted by the council, it is to be hoped that an architect of eminence will be employed as arbitrator.

CHIPS.

The funeral of Mr. Robert Thompson, who had been surveyor to the Waterloo-with-Seaford Local Board for over 17 years, took place on Saturday in St. Luke's Churchyard, Great Crosby.

On Saturday the district church of St. Hilda's, Hedgefield, in the parish of Ryton, was consecrated by the Bishop of Durham. Plans were prepared by Messrs. Oliver and Leeson, of Newcastle-on-Tyne, and the contract for the building was let to Mr. Pringle, of Newcastle. The building consists of a nave, with one aisle. It seats 350 people, and the cost has been £3,500.

The Dursley Rural Sanitary Authority have called in Mr. A. P. J. Cotterell, Assoc.M.Inst.C.E., to prepare a scheme of water supply for the town of Wotton-under-Edge, Gloucestershire.

The Steyning Board of Guardians have instructed their architect, Mr. Arthur Loader, of Brighton, to proceed with the preparation of the contract drawings and plans for infirmary buildings at New Shoreham, his sketch plans having been already practically approved by the Local Government Board. Mr. Loader was further instructed to prepare plans and specification for extensions to the old laundry buildings upon which to obtain contracts.

The Tate Laboratory and new classrooms which have been added to the Birkenhead Institute were formally opened on Monday. The laboratory has been provided by Mr. Henry Tate at a cost of about £1,000. It provides additional accommodation for 300 students, and has been erected from designs by Mr. T. Mellard Reade, of Liverpool, the architect of the Institute, to which the extension forms a new wing.

The sanitary committee of the Newcastle-on-Tyne city council have resolved to invite competitive plans for the building of a lodging-house, to provide accommodation for 300 men, upon a site in the Milk Market; also for a building to contain 50 single-room tenements on the Milner's Hill site; and also for a lodging-house to accommodate 100 women on a site in the City-road.

The finance committee of the Parish Church of Walsall have decided to substitute for the present choir stalls others more suited to the dignity of the fine chancel. Designs procured from Mr. J. L. Pearson, R.A., have been approved, and the execution of the work has been intrusted to Mr. Bridgeman, of Lichfield. The cost will be about £780.

At Lurgan, on Tuesday, a one-legged man was committed for trial on a charge of causing the death of a builder and publican named Archer. The prisoner undertook to cure Archer of erysipelas in his leg by means of a charm, but mortification set in and death ensued.

Building Intelligence.

ALNABREAC, N.B.—A shooting-lodge is at present being erected by Sir Tollemache Sinclair, Bart., near the Alnabreac Railway Station. The building is to contain 16 bedrooms, dining-room, drawing-room, smoking-room, billiard-room, gun-room, servants' hall, two bath-rooms, five lavatories, besides kitchen, gillies' apartments, &c., and the whole is estimated to cost nearly £4,000. The lodges are all connected by telephonic communication, and an abundant supply of water is supplied by gravitation. The architect is Mr. Donald Leed, of Thurso, and the contractors are:—Mason work, Peter Bain, Thurso; joiner, William Innes, Halkirk; slater, James Reid, Thurso; plumber, James Mercer, Thurso; plasterer, William Coghill, Lybster; and painter, James Tytler, Cramond, Thurso. With regard to Sir Tollemache's building operations, it may be of interest to state that during the last three years he has expended some £12,000, including cottages for farm servants, on his estate, and more of such are in contemplation.

CHALLOCK.—The reopening of the 13th-century parish church of Challock, which has undergone repair and renovation, took place on July 25th, the Archbishop of Canterbury attending. The chancel was partially rebuilt in 1873, and this portion remains in excellent condition. The present outlay in the nave has been about £1,350. The whole of the fabric, except the tower, has been restored, all the old portions and evidences being carefully preserved. The church has been re-seated and refloored, the ancient chancel screens have been cleaned, and the arcading restored. The font, which occupies an almost unique position behind the second column of the south arcade, has also been restored, together with the old roof and the windows. In the latter some ancient glazing, which has been used before, has been included, the original position being adhered to as far as possible. The old stoup discovered behind the south doorway has been renovated and preserved. The screens, which formerly belonged to the rood loft, are some of the finest in the country.

DUFTOWN.—The Free Church at Duftown, N.B., was reopened on the 27th ult. after alterations and additions. The church is almost of the form of a Roman Cross, and is built of the finest Spynic freestone. The most prominent feature in the exterior is a square tower, which is situated at one of the corners of the main front, and stands about 60ft. high. The main front is in gable form, and the principal feature is a five-light window, filled with cusped and foliated tracery, and, like all the other windows of the church, is of stained glass. The whole of the interior finishings are of pitch-pine varnished. The church is heated by the high-pressure system. Mr. James Souttar, architect, Aberdeen, designed and superintended the work.

OSWESTRY.—The Mayor of Oswestry laid, on Friday, the foundation-stone of the new municipal buildings. The new buildings are being erected on the site of the old Guildhall on the Bailey Head. The style is that of the 17th-century Renaissance treated freely. The exterior will be faced with Grinshill stone. A bas-relief of St. Oswald, the patron saint of the town, which was on the pediment of the old Guildhall, will be introduced into the new edifice. The municipal buildings are to include a central hall, council-chamber, magistrates' and county court room, town clerk's, borough surveyor's, magistrates' clerk's, and assistant-overseer's and county-court offices; rooms for the reference and lending libraries, and school of science and art, &c. The original architect was Mr. H. A. Cheers, of Twickenham; but his plan, at the request of the town council, underwent considerable alteration at the hands of Mr. T. M. Lockwood, of Chester, the consulting architect in the competition in which Mr. Cheers' designs were selected, and the work will be carried out under the superintendence of Mr. Lockwood. Mr. W. H. Thomas, builder, of Oswestry, is the contractor, the amount of the contract being £8,597.

The West Riding County Council have decided, in consequence of the increase of lunacy in the Riding, to enlarge Menstone Asylum by the addition of blocks for 600 chronic patients, at an estimated cost of £86,000.

Engineering Notes.

THE INSTITUTION OF MECHANICAL ENGINEERS AND THE DISPOSAL OF SEWAGE.—At the summer meeting of the Institute of Mechanical Engineers, held in the Town Hall, Portsmouth, on Friday, Dr. William Anderson, the president, occupied the chair. A description of the Portsmouth sewage outfall works was given by Sir Frederick Bramwell, who pointed out that the system was one which depended entirely upon the employment of steam-engines and pumps, and was therefore essentially one of mechanical engineering. In the case of seaside towns, such as Portsmouth, the simplest and most ready way of dealing with sewage when collected was to deliver it into the sea, choosing, if possible, some point where its delivery would not be a nuisance, and some point also where it could be caused to flow into a tidal or other current. In this particular respect Portsmouth was well placed. Mr. Cochrane, one of the council of the Institute, stated that Sir Frederick Bramwell had solved the problem of avoiding the reflex action of the sewage upon the town, and of so discharging it as to cause no nuisance elsewhere. It might be a question whether it was wise to send sewage out to sea at all. But if there were no means of discharging it on land there was cause for congratulation at Portsmouth that they were able to carry it right away to sea, never to return. In replying, Sir F. Bramwell said that there was no engineering problem so difficult as that of getting rid of the sewage of large towns. The question of the disposal of sewage again came up in a paper prepared by Mr. William B. G. Bennett, burgh engineer and surveyor of Southampton, who gave a description of the sewage precipitation works and refuse destructor at Southampton. The corporation in 1885 found it desirable to clarify by precipitation the sewage of a particular district, and also to introduce a more efficient system for the collection and disposal of house refuse. They therefore adopted a refuse destructor for destroying the ash-bin contents and garbage of the town, whilst it was arranged that all sewage sludge should be transmitted to the destructor from the two existing reservoirs, in which it was deposited in the process of clarification. The sludge, after mixture with road sweeping, turned out good manure, whilst the refuse was utilised for fuel. The initial cost of the complete destructor was £3,723, and the sewage disposal works on the town quay cost about £3,000—this sum, however, being exclusive of the cost of two other works.

CHIPS.

The members of the Manchester city council paid a visit of inspection last week to the sewage works, including the outfall works at Davyhulme, about four and a half miles from the city. For the construction of the works the corporation have power to borrow £500,000. Half of that sum has been already spent, and the works are rapidly approaching completion. It is expected that they will be in operation by the end of next year.

The Duchess of Teck laid, on the 28th ult., the foundation stone of the church of St. Barnabas, which is about to be erected on a site between the Woodward and Townley roads, Dulwich. The building will cost about £9,000.

Several villa residences are being erected in the neighbourhood of Burton-on-Trent, of which Mr. R. E. Carpenter, M.S.A., of Burton, is the architect. One at Tutbury, for Mr. W. Barker; one on Branstone-road, Burton, for Mr. C. O. Hall; and two semi-detached in Derby-street, Burton, for Mr. Collyer. The builder for the Tutbury residence is Mr. Dickinson, and for the Burton residences Mr. Hodges.

The committee of the Blind Asylum, Bristol, have instructed Mr. A. P. J. Cotterell, Assoc. M. Inst. C.E., of that city, to prepare and carry out a new system of drainage for their buildings.

Mr. Dyack has been appointed borough surveyor at Aberdeen at a salary of £400 a year, rising by £50 per annum till it reaches £600.

The County Council of Staffordshire have decided to purchase the Bank Farm, Cheddleton, for £12,750, as the site for the proposed new lunatic asylum. The farm covers 178 acres, and will cost £71 12s. 6d. per acre.

The death occurred on Wednesday, at Ixelles, Brussels, of the Belgian painter, Joseph Stevens, in his seventy-fourth year. He produced many pictures which were highly valued both in France and Belgium.

TO CORRESPONDENTS.

(We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.)

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

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ADVERTISEMENT CHARGES.

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Front Page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL, XLII, XLVI, XLIX, L, LI, LIII, LIV, LVIII, LIX, and LX may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—J. R. A. (Shrewsbury).—G. R. S. and Co.—F. R. G. S.—Scotia.—T. and M. B. Co.—B. N. T.

Correspondence.

LAND SURVEYING.

To the Editor of the BUILDING NEWS.

SIR,—In his letter of July 15th, "Northman" has made a serious mistake in his calculations; AF and AY are nearly equal, yet he assumes that AF is 1,570 links, and AY 592 links. This of course throws his figures out.

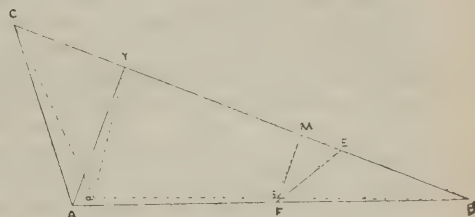
The remark that "even on a scale of three chains the length DEF will not alter more than two or three links," shows confused geometrical ideas, or at least language, for surely he knows that the scale upon which a field is plotted cannot alter the length of the lines relative to one another.

In Fig. 4, DB is perfectly checked by AF.

So far as I can make out, "Northman" claims that in the case of the triangle ACB, AY is an effective check on the length of AF, while EF is not. Let a be the position shown for A by incorrect chaining of AF; let f be then the position of F; let MF be parallel to YA; the difference between Ya and YA is the amount the check-line will appear too long, and the ease with which an error is seen is directly proportionate to this. If AF is half AB, the difference MF - Mf = $\frac{1}{2}$ (YA - Ya), owing however to EF being inclined to YA, EF - Ef = about $\frac{2}{3}$ (YA - Ya), so that an error is two-thirds as easy to detect by EF as by AY. This leaves us plenty of room to see at once if a material error has been made. In the case in point (Fig. 5), it was therefore deemed advisable to make this trivial sacrifice in order to pick up detail without a confusing and unnecessary number of lines. When it is impossible to measure AY, or where another check, such as FE, is useful to pick up detail, most triangles

can be sufficiently checked by a cross-line, which cuts off at least one-third of one side.

It is important to impress on students that a hard and fast rule, such as "always plot the



diagonal first," should not be allowed to override the needs of particular cases, every one of which demands a little extra study,—I am, &c., Gravesend, July 25. G. W. COBBHAM.

CHIPS.

The Corporation of Oldham, after careful consideration, have selected the improved patent mechanical system of Messrs. Baird, Thompson, and Co., ventilating engineers, as being the most efficient for their new scheme of ventilation for the town-hall and county buildings, and accordingly have placed the buildings and contract in their hands.

The new schools, Crathie, near Ballater, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

The parish church of Hanging Heaton is about to be restored at an estimated cost of £1,600. Mr. W. Swinfen Barber, of Halifax, is the architect.

A meeting of property owners was held at the Imperial Hotel, Morecambe, on Saturday, for the purpose of considering proposals for the erection of a new pleasure pier for the west end of the town. Mr. Harker, C.E., of Manchester, attended the meeting, and submitted plans for a new pier and pavilion for entertainments, the total cost of which was roughly estimated at about £30,000. It was unanimously resolved that it was advisable such an undertaking as the one suggested be carried out at the west end of the town. A committee of eleven gentlemen was appointed for the purpose of considering the details and the erection of the structure.

A gift was presented last week to Hereford Cathedral by the Rev. Canon Phillott, the gift taking the form of a brass lectern fashioned from the design of Mr. H. Prothero, of the firm of Messrs. Middleton, Prothero, and Phillott, of Cheltenham. It has been made by Messrs. Barkentin and Krall, of Regent-street, London.

A serious landslip occurred on Saturday evening at Mr. Robinson's slate quarry at Nantlle Vale, whereby the future working of the quarry will be for a time affected. The fall involved the dislocation of several thousand tons of the rock, completely covering the lower portion of the works. A slip had been expected for some days. The men employed in the pit had only cleared their implements out on Saturday afternoon.

The Meath Home of Comfort, at Godalming, for epileptic women and children, was opened yesterday (Thursday) by the Duchess of Albany. The mansion known as Westbrook House has been purchased by a lady, and adapted to the purposes of the home. Accommodation will be provided for 50 or 60 women and children.

In consequence of the increasing population of the Rhondda Valley, it is proposed to erect five new churches in the Vale. The suggested sites are at Treorky, Ynysfeio, Ystrad Rhondda, and Gelli-road, the fifth being a reconstruction of the existing parish church. The churches will seat from 350 to 500 persons each, and about £2,000 has been provided as the nucleus of a building fund.

By the collapse of a scaffold at Burns Mill, now in course of erection in Manchester-street, Heywood, on Saturday afternoon, two men named Martin Macnamara and Ashton were killed, and another named Thomas Scanlan was so severely injured that he died soon afterwards. Two other workmen had narrow escapes. At the inquest held on two of the victims on Tuesday, William Houldsworth, foreman mason to the building contractors, Messrs. E. Taylor and Co., of Littleborough, said the accident resulted from Ashton leaving the crane to put a roller straight; that was witness's work, and Ashton had no business with it. The jury returned a verdict of accidental death, adding a recommendation that any work of a like nature should be better manned in future, and that more regard should be paid to the strength of the scaffolding.

Legal.

REAL PROPERTY LIMITATION ACT.

IT has often been too readily assumed that the possession of land or houses for over twenty years, or since 1878 for over twelve years, gave the party having such long possession a legal title to the property, besides preventing anyone else who claimed it from succeeding in an action for its recovery. This is not so, however, although there are cases and judicial dicta which seem to support that idea. Of course, in many cases it comes to much the same thing, for if a person has by such a period of possession obtained such a hold upon the property as that he cannot be ejected, he has become, for all practical purposes, its legal owner, although he could only sell with a possessory title which many would not care to buy. But when the point comes to be applied to a leasehold interest, the difference in the legal effect is soon seen to be very material. This occurred in the recent case of "Tichborne v. Weir" (*Times*, July 22), before the Court of Appeal, and where the cases were gone into and an important decision given.

There the action was for breach of covenant to repair property in Gray's Inn-road, on the Doughty Estate, the plaintiff being ground owner, and the defendant being sued as assignee of a lease which had just terminated. The facts showed that the lease of this house had been granted in 1802 for 99 years, to one Baxter, who about 1836 deposited the lease with one Giraud, by way of equitable mortgage. In 1836 this equitable mortgagee took possession, and so held the property by mere possession until 1876, when he purported to assign the legal estate to the present defendant, who entered, and had since paid his rent to the plaintiff as freeholder. Upon the termination of the lease he was now sued for the cost of repairs under the covenants in the lease. His answer was that he could not be liable, as he was not assignee, and, in fact, had no legal estate in the property, because Giraud, who had purported to assign to him, was only an equitable mortgagee in possession. In short, Baxter, the original lessee, had never assigned the lease to anyone, and so there was no assignee. The plaintiff sought to argue that as Giraud, by his possession over twenty years, had got a good title against all comers, under the Statute of Limitations, the effect of that statute was to make him assignee of the lease by operation of the law, so that he could, and did, legally assign to the defendant. The judge held, and now the Court of Appeal all agreed in holding that the effect of the statute is simply to bar the party out of possession from recovering the land, and not to transfer any title or estate to the party in possession, as has been often supposed. The result was, of course, judgment for the defendant, who, not being assignee of the lease, was not legally liable upon its covenants.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

The National Gallery has recently been enriched by four pictures of high value, bequeathed by the Right Hon. Sir Wm. H. Gregory, a late trustee of the Gallery. The subjects of these pictures are "The Adoration of the Shepherds," a large painting by Giam Gerolamo Savoldo, of the Brescian School; an interior, with figures in black and white, by Jan Van Steer, of the Dutch School; "Christ in the House of Martha," by Velasquez; and a sketch of a duel in the Prado by the same painter.

At a Consistory Court held at York Minster on Friday morning faculties were decreed for alterations at St. Stephen's, Eastwood, Rotherham; to the vicar and churchwardens of Bolton-upon-Dearne to remove the seating, and re-seat and refit the church; to the vicar and churchwardens of St. John's, Newland, Hull, to remove gallery, sittings, and internal fittings, and to build new chancel, organ chamber, and vestries; to the vicar and churchwardens of Thorpe Salvin, near Rotherham, to remove western gallery, build new organ chamber, re-hang the bells, remove the floor and refit the church; to the vicar and churchwardens of Greasbrough, to re-seat; and to the vicar and churchwardens of Carnaby, Fraithorpe, to re-seat, re-floor, and refit the chapel.

LEGAL INTELLIGENCE.

ACTIONS BY AN ARCHITECT AGAINST BUILDERS.—Judgment has been issued by Lord Low in two actions. In the first, James Robert Pearson, architect, Edinburgh, sued William Gray, builder, 55, Grove-street, Edinburgh, for payment of the sum of £288 16s. 7d., alleged to be due by the defender for drawing plans and services rendered in connection with the erection of a double villa in Suffolk-road, and two villas in Mortonhall-road, Edinburgh. In the second action the pursuer sued the firm of William Gray and Sons, builders, 55, Grove-street, for payment of £87 7s. 3d., alleged to be due for services rendered to the defenders in connection with certain alterations they were making upon buildings in Morrison-street and Blacket-place, Edinburgh, which included a sum of £37 15s. alleged to have been overpaid to the defenders in connection with the erection of a double villa at the corner of Fountainhall-road and Lauder-road, Edinburgh, belonging to the pursuer. The work at this latter villa was measured up by Mr. Roberts, surveyor, Frederick-street, who reported that the value of the work executed by the defenders amounted to £1,122 5s., and as the defenders had previously received £1,160 on account of that work, the pursuer claimed repayment of £37 15s. In defence to both actions the defenders denied that they were due the sums sued for. The Lord Ordinary has now pronounced a final judgment finding the pursuer entitled to the sum of £50 1s., being the amount decreed for by his lordship in his previous interlocutor, less the sum found due to the defenders under Mr. Belfrage's report; but found the pursuer liable to the defenders in expenses, subject to modification.

IN RE H. TOTEN, SONS, AND YOUNG.—A petition was recently presented by the debtors, who are described as builders of Gloucester-road, South Kensington, and Maude-grove, Fulham-road. The liabilities are stated to amount to about £4,000, with assets £2,000. Mr. Registrar Linklater has made the usual receiving order, and an adjudication of bankruptcy has also been made.

LAW PROCEEDINGS IN THE ISLE OF MAN.—An incident of an extraordinary and amusing description has occurred at Ramsey, in the Isle of Man, as the result of an action brought against the Town Commissioners by Messrs. Holme and King, contractors, of Liverpool. Messrs. Holme and King's action was to recover a large sum of money upon a contract for the sewerage of the Mooragh estate, which had been laid out for ornamental grounds and promenade residences. As the result of the first hearing of the action, the court gave the plaintiffs judgment for £1,020. An appeal took place in regard to a still larger amount which had been claimed; but this resulted in favour of the commissioners. The leading advocate for the plaintiffs (Mr. J. C. Lamothe) is the high sheriff or chief magistrate for the town, and subsequent to the hearing of the appeal he demanded from the town authorities payment of the £1,020, which had stood over since October last. Some delay taking place in regard to the payment, Mr. Lamothe wrote a peremptory note requiring an immediate settlement, and threatening, as an alternative, to issue execution. A summons of this character, of course, had to receive attention, especially in the midst of the fair promise of the tourist season, and the commissioners accordingly paid up the money; but the summary procedure has aroused much angry feeling.

Alterations have been made to the Royal Mint, E., embracing the ventilation, which is now carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

Mr. Hugh S. Cregeen, who has held the office of surveyor to the Bromley local board for upwards of twenty years, having been compelled through continued ill health to resign that appointment, has since been appointed consulting engineer and surveyor to the board at a salary of £150 per annum.

The Duchess of Teck on Wednesday laid the foundation-stone of the north transept and vestry at East Twickenham church. The first section of the church was built some years ago, and the works now inaugurated will bring the erection of the edifice almost to completion. The building has cost £15,250, the present work involving an additional outlay of £2,200, besides which a further sum will be required for a spire.

The foundation stone of a new Catholic Apostolic church, in course of erection in Bath-road, near the Park, at Wolverhampton, was laid on Tuesday. The building will consist of nave 57ft. long and 22ft. wide, and a chancel 40ft. long and 22ft. wide, with organ chamber. A special design of mosaic pavement will be laid in the floor of the altar platform. The church will seat 300 persons. The style is Early Gothic, and the external walls will be erected in red brick, with Hollington stone dressings. Mr. H. W. Rising, of London, is the architect, and Mr. Lovatt, of Wolverhampton, the builder.

WATER SUPPLY AND SANITARY MATTERS.

MIDSOMER NORTON.—Major-General H. D. Crozier, R.E., held a Government inquiry on the 12th ult., with regard to the application of the board for a loan for sewerage purposes and water supply. The chairman of the board, Mr. F. Bird, C.C., explained that the scheme was promoted with a view to prevent an injunction being applied for by the Radstock Board against them, to obviate the nuisance caused by the overflow of the existing sewage tanks into a brook. The system recommended and explained by the engineer, Mr. C. Nicholson Lailey, of Westminster, is that known as the international process of precipitation by ferrous and filtration through polarite beds. Dr. Angell, F.I.C., county analyst, Southampton, was in attendance to describe the chemical action of the process, and in the course of examination stated that the admission of surface water to a reasonable extent, facilitated any process of purification (whether by irrigation or chemical treatment combined with polarite filtration) by reason of the oxygen contained in the water.

TOXTETH PARK.—Major-General Crozier, R.E., and T. W. Thompson, inspectors of the Local Government Board, on the 1st inst. completed an inquiry, at St. George's Hall, Liverpool, regarding an application of the Toxteth Park local board for sanction to borrow £17,400 for destructor works, hospital extensions, sewerage, and other works, from the plans and designs of Mr. John Price, A.M.Inst.C.E., F.S.I., engineer and surveyor to that board. Besides Mr. Price, the following gentlemen gave evidence in favour of the destructor works:—Mr. T. Wainwright, F.S.I., chairman; Mr. H. Hartley, F.R.I.B.A.; Mr. T. de Courcy Meade, M.Inst.C.E., engineer to the Hornsey local board; and Mr. J. A. Brodie, A.M.Inst.C.E., of Liverpool. Mr. Isaac Dixon, M.S.A., surveyor to the Wavertree local board, gave evidence against the proposed site; also Mr. Pain, F.S.I., and Mr. Wylie, for certain adjoining landowners and residents. The inspectors, after visiting the sites of the various works, will report to the Local Government Board in due course.

CHIPS.

It has been decided to re-roof and otherwise restore, and also to decorate, the parish church of Redditch, at an estimated cost of £900.

At Tuesday's meeting of the Glasgow town council the recommendation of a committee that the ground in Garscube-road, where stand the dismantled works of the Phoenix foundry, should be purchased and laid out as an open space, was agreed to. The ground extends to 14,000 square yards, and the price to be offered is 30s. per yard. The scheme implies a capital charge of £22,764 for purchase money.

The bust of William Murdoch, the inventor of gas-lighting, contributed to the Wallace monument at Sterling by the North British Association of Gas Managers, was unveiled on Friday, the 29th ult., by Lord Kelvin. The bust is of marble, and has been executed by Mr. D. W. Stevenson, R.S.A., of Edinburgh.

A fire, doing damage estimated at from £10,000 to £12,000, occurred on Thursday in last week, at the large sawmills of Messrs. W. Nicholson and Son, Hunslet, Leeds. The building in which the fire originated was completely gutted, and for a time 600 men will be thrown idle.

A few days ago a German painter, Julius Huth, passed away who has done much to familiarise the German public with English landscape. Within the past 15 years his pictures were hung in nearly every Continental exhibition, at many of which he carried off medals. Among his best pictures may be named "Cape Wrath, on the north-east coast of Scotland," "Northern Fishermen," "Scarborough, on the English north-east coast" (1884), "Norwegian Coast," and "Fishermen in Storm" (1886). Many unfinished studies of value are left in his studio.

Captain H. B. McCalmont, owner of the Bishop's Wood estate, Ross, Herefordshire, intends building new training stables in the Wye Meadows, near to Bishop's Wood. The work will be under the superintendence of Captain W. Partridge, from plans prepared by Mr. A. H. Pearson, architect, Ross.

The laying of a foundation-stone for a greatly enlarged and more suitable building for the Guildford High School for Girls took place on Thursday, the 28th ult. A site has been acquired at the corner of the London-road and Nightingale-road, close to the London-road Station. The building will be in brick and terracotta. It will comprise an assembly-hall 60ft. by 30ft., five classrooms 18ft. by 22ft. Accommodation will be provided for 150 pupils. Mr. S. Welman, of the firm of Welman and Street, is the architect, and Mr. P. C. May is the contractor.

Our Office Table.

MR. WILLIAM SAUNDERS'S alternative scheme for a new thoroughfare between Holborn and the Strand is a much better and more useful project than the Council Broadway. Instead of ending the road southwards abruptly against the flank of St. Mary-le-Strand, and at an impracticably high level, he proposes to strike a direct line further to the east, at the City instead of the Wellington-street end of the doomed Holywell-street "island." This street would thus end at the open space west of the Law Courts, opposite St. Clement Dane's Church, which would be cleared away. Southwards, the thoroughfare would be extended by way of the much-needed bridge over the Thames, between Waterloo and Blackfriars, to Webber-street, Blackfriars-road; and a northern extension to Euston would complete a street incomparably better and little more costly than the isolated fragment of an improvement advocated by the County Council.

The architects of Philadelphia have published a protest relative to the conduct of the competition for the Bourse about to be built in that city. The building committee proposed to erect a building costing £300,000 sterling, ten stories high, and covering a site 364ft. by 130ft. It issued an invitation to all practising architects of Philadelphia to compete, under excellent terms as to premiums, anonymous signatures, specific drawings, &c., but proposed to pay the successful architect but 2 per cent. on the cost, and to place the superintendence in the hands of an engineer, the architect to be still retained as subordinate to this engineer. To these last two provisions the architects objected, and, meeting together, appointed a committee to conduct the opposition. All attempts failing to have the objectionable clauses removed, a paper was issued, refusing to enter the competition under these terms, which was either signed or verbally approved of by every architect in the city except about six, and including every one of any prominence, and a protest was sent to every member of the profession in most of the large cities in the United States, with a view to informing them as to the merits of the case. The matter then rested, and no decision has been made yet.

MR. R. R. TATLOCK, the city analyst of Glasgow, has conducted a series of experiments for the purpose of ascertaining the best materials, as regards efficiency and economy, for use in the precipitation and treatment of the sewage of the Bridgeton district. In making the experiments, the analyst was also guided by the question whether the consumption for sewage purposes would be likely to affect the common market in which they are sold. As the result of twenty-nine experiments, Mr. Tatlock is forced to the conclusion that, if the necessary efficiency is to be attained, one of the processes based upon the use of sulphate of alumina in conjunction with lime ought to be employed; it would cost about 18s. per million gallons. He also remarks that it is very desirable, if not absolutely necessary, to filter the whole of the effluent. The best materials other than those of gravel and sand would be those employed at Sheffield, such as coke and breeze, which have the advantage of serving as fuel when they are exhausted in the filters.

THE Perth builders had their eighteenth annual excursion on Thursday in last week. At 7.30 about fifty gentlemen started in four brakes from Prince's-street, and drove by Bridge of Earn, Forgandenny, and Invermay to Dunning, where there was a halt for half an hour. On reaching Auchterarder, luncheon was served in the Star Hotel. The party visited Drummond Gardens, where some time was pleasantly spent. Crieff was reached about four o'clock in the afternoon, and dinner was served in Stewart's Hotel. Mr. Beveridge presided, and the croupiers were Councillors Smart and Davidson. After dinner, Mr. T. Craig, of the firm of A. and T. Craig, builders, of Dundee, proposed "Success to the Perth Building Trades," and Mr. J. Ballantine, joiner, acknowledged. Mr. D. Beveridge, in giving "The Architects," said that within the last twenty years there had been a marked improvement in the buildings in Perth. Other toasts followed.

Steps are being taken to raise Castleford, Yorks, from a town under the jurisdiction of the local board to the dignity of an incorporated borough.

Trade News.

WAGES MOVEMENTS.

COLCHESTER.—The recent dispute in the building trade has been amicably settled. The masters have met and decided to grant a rise of a halfpenny per hour on November 1, and also to sign a code of working rules. These terms have been accepted by the men, and the strike, therefore, ended last week.

COLNE AND NELSON.—On Saturday the plasterers at Colne and Nelson, Lancashire, struck work, demanding an advance from 7d. to 8d. The masters offered 7½d. advance.

EALING.—The central committee have sent out notices to the master builders of Ealing district stating that on and after August 8th they should be requested to pay 9½d. per hour (in place of 9d. per hour) to their men, and agree to the code of working rules adopted by the local branch of the society. The masters have been paying 9d. per hour.

LAMBETH.—The strike of bricklayers and labourers against free labour at the Nelson Wharf, Commercial-street, Lambeth, has been settled. A meeting of the strikers was held on Thursday in last week at the Wharf, at which Messrs. Thorne (secretary Gasworkers' Union) and W. Stevenson (Builders' Labourers) were present, and both advised the men to return to work and leave the free labour question to be discussed between the union officials and the employers. After two hours' discussion the majority of the men decided to return to work.

PONTYPRIDD.—The builders' strike at Pontypridd, which has lasted three months, has ended by the masters consenting to pay the men 9d. per hour, and to strike out the clause which the Cardiff masons declare they want struck out in the rules published by the Master Builders' Association. The Cardiff strike has also been ended on similar terms.

CHIPS.

The organ in Fowey parish church was opened on the 28th ult., after reconstruction by Messrs. Hele and Co., of Plymouth.

A memorial window was unveiled in Thornbury parish church on Friday. It represents "Our Lord Blessing Little Children," and the artist is Mr. A. O. Hemming, of Cavendish-square, London.

The 22nd autumn exhibition at the Walker Art Gallery, under the auspices of the Liverpool corporation, will open on Monday, September 5th, and will close on December 17th.

An additional window in the parish church of Kettins, N.B., has been filled in with stained glass by the Hallyburton family. The subject is the "Last Supper," and the work has been executed by Messrs. Ballantine and Gardiner. The window was formally handed over to the church authorities on Saturday last.

Mr. Morris Muleley, builder, of Salford, has been fined forty shillings and costs, inflicted under the Salford Improvement Act of 1870, for allowing six new houses, of which he is the owner, to be occupied without first having them certified as fit for human habitation.

An extensive block has just been added to the Colchester workhouse. Mr. J. W. Start, of that town, was the architect, and Mr. Chambers the builder.

The directors of the St. Julian's Brickworks Company held a meeting at Newport, Mon., last week, at which the tender of Mr. J. T. Morris, of Newport, was accepted for the erection of new engine-house and other works in connection with the development of the company's property. The tender is for £6,000. In addition to this, there will be erected kilns on a new principle, at a cost of about £1,500; and other improvements will bring the total outlay up to nearly £9,500.

At the last meeting of the Hampshire County Council a committee recommended that plans which had been prepared by Sir Arthur Blomfield, A.R.A., and Mr. Robinson (the county surveyor), for the new county offices facing Upper High-street and adjoining Westgate, should be adopted. On the motion of Sir Nelson Rycroft these plans were adopted. The estimate for the new offices is about £8,000.

Mr. A. P. J. Cotterell, Assoc. M.Inst.C.E., of Bristol, has been called in by the Wincanton Rural Sanitary Authority to advise them as to supplying the town of Bruton with water.

On Sunday a baptismal font which has been presented to the Roman Catholic church, Old Goole, was unveiled and blessed. The font is of Caen stone, and is placed on two large steps. The carvings on the panels surrounding the font represent the Seven Sacraments. The work has been executed by Mr. A. H. Wall, of Cheltenham.

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TENDERS.

* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

BERMONDSEY, S.E.—For dividing the long room in each of two departments in the Alexis-street school into three classrooms, for the London School Board:—

Goad, W. V.	...	£425 0 0
Leeks and Hooker	...	398 0 0
Nightingale, B. E.	...	295 0 0
Charteris, D.	...	280 0 0
Downs, W., Waiworth (accepted)...	...	271 0 0

BETHNAL-GREEN, E.—For the enlargement of the Maidstone-street schools, Bethnal-green, by 798 places, and also for carrying out various improvements in the school, for the London School Board:—

Kilby and Gayford	...	£17,119	...	£263
Clarke and Bracey	...	16,576	...	260
Atherton and Latta	...	16,560	...	261
Longley, J., and Co	...	16,451	...	268
Charteris, D.	...	16,397	...	270
Grover and Son	...	16,310	...	269
Pattinson, S. and W.	...	15,217	...	269
Williams, G. L. S.	...	15,117	...	268
Cox, C., Hackney (accepted)	...	14,742	...	238

A.—If brickwork be built in cement, add.

[(a) Cost of class-room accommodating 793 places, £4,521; (b) class-rooms accommodating 400 places in lieu of two class-rooms converted into a hall on each floor, £2,110; (c) corridors, cloak, and lavatories, £2,111; (d) w.c.s, £440; (e) drainage, £690; (f) boundaries, £212; (g) teachers' rooms, £300; (h) schoolkeeper's house, £1,046; (i) works for existing buildings, £1,960; (j) extra depth of foundation, £1,152; (k) brickwork to be built in cement, £238; total, £14,780. Cost per head of (a) only, £5 13s.; total cost per head of entire school when completed, £8 15s. 5d.]

BROCKLEY, S.E.—For removing three temporary iron buildings from Ivydale-road, Nunhead, and for re-erecting them in Brockley-road, for the London School Board:—

Croggon and Co.	...	£570 0 0
Harbrow, W.	...	491 0 0
Cruwys, T., Camden Town (accepted)	...	450 0 0

BIRMINGHAM—For the erection of two villa residences in the Thornhill-road, Handsworth, for Mr. A. Jones. Mr. Oliver Floyd, architect:—
Grant, H., Selly Oak (accepted) ... £897 0 0

BRISTON, S.W.—For converting the two large rooms in the girls' department of Stockwell-road school into three smaller classrooms by glazed sliding partitions, for the London School Board:—

Goad, W. V. ... £187 0 0
Holloway Bros. ... 140 0 0
Maxwell Bros., Ltd. ... 140 0 0
Garrett, J., and Sons ... 186 0 0
Downs, W., Walworth (accepted) ... 118 10 0

BROMLEY-BY-BOW—For dividing the two large classrooms of the boys' and girls' departments at the Knapp-road school into three smaller rooms, for the London School Board:—

Kilby and Gayford ... £475 0 0
Robey, J. T. ... 472 0 0
Lawrence, E., and Sons ... 495 0 0
Vigor and Co. ... 425 0 0
Calnan, M., and Co., Commercial-road (accepted) ... 352 0 0

CANNOCK—For the supply and fixing of heating apparatus at the West Hill board school:—
Jellyman, S., Cannock (accepted) ... £69 15 0

CANNOCK—For painting the various schools belonging to the school board:—
Benton, J., Hednesford (accepted) £104 2s. 6d.

CLAPHAM, S.W.—For dividing two large classrooms in the Larkhall-lane school, Clapham, into three smaller rooms, for the London School Board:—

Hammond, W. ... £165 0 0
Holloway Bros. ... 158 0 0
Garrett, J., and Son ... 157 0 0
Triggs, E., Clapham (accepted) ... 125 0 0

CLAPHAM, S.W.—For the enlargement of the Haselrigge road School, Clapham, by 372 places, and also for providing a new girls' staircase, cloak-rooms, and five other rooms, for the London School Board:—

Hart Bros. ... £5,420 ... £81
Nightingale, B. E. ... 5,102 ... 95
Lawrence, E., and Sons ... 4,779 ... 70
Holloway Bros. ... 4,556 ... 71
Downs, W. ... 4,506 ... 60
Holliday and Greenwood ... 4,124 ... 66
Co-operative Builders, Ltd., Burton-road, Brixton (accepted) ... 3,836 ... 53

A.—If brickwork be built in cement, add.
[(a) Cost of classrooms accommodating 372 places, £1,571; (b) staircases, cloak-rooms, and corridors for the whole school, £868; (c) teachers' room, £100; (d) technical room, £445; (e) playgrounds and drainage, £130; (f) works to existing buildings, £399; (g) extra depth of foundations, £23; (h) brickwork in cement, £53; total, £3,889. Cost per head of (a) only, £5 0s. 7d.; total cost per head of entire school when completed, £10 15s. 2d.]

DALSTON, E.—For dividing a room in the boys' department of the Wilton-road school, Dalston, by providing a glazed sliding partition, for the London School Board:—
Grover, J., and Son ... £56 0 0
Britton, F. ... 55 0 0
McCormick, T., and Sons, Canonbury-road (accepted) ... 49 10 0

DEPTFORD, S.E.—For erecting a laundry centre and a technical room at the Stanley-street school, Deptford, and also for carrying out various additions and improvements to the school, for the London School Board. Second list of tenders:—

Garrett, J., and Son ... £2,960 ... £50
Dearing, C., and Son ... 2,851 ... 89
Whitehead, L., and Co. ... 2,786 ... 67
McCormick, T., and Sons ... 2,778 ... 67
Willmott, J., and Sons ... 2,669 ... 66
Coxhead, F. J., Leytonstone* ... 2,603 ... 54

A.—If brickwork be built in cement, add.
* Accepted.

[(a) Cost of technical room and laundry centre, £1,503 17s. 6d.; (b) tar-paving and covered playgrounds, £419 11s. 2d.; (c) boundary walls and gates, £315 12s. 2d.; (d) w.c.'s for boys' department, £134 17s. 1d.; (e) works to existing buildings, £133 2s. 1d.; (f) extra depth of foundations, £96; (g) brickwork in cement, £54; total, £2,657.]

EAST DULWICH—For piercing windows in the south wall on the ground and first floors of the Adys-road school, East Dulwich, for the London School Board:—

Goad, W. V. ... £75 0 0
Holloway Bros. ... 66 0 0
Downs, W., Walworth (accepted) ... 49 0 0

EDINBURGH—For causewaying the carriage-way of Dean Bridge, for the city council:—
Brebner, R. C., Edinburgh (accepted) 1,063 1s. 4d.

HANLEY—For the erection of the Wellington schools to accommodate 660 children, for the Hanley School Board:—

Cornes, C., Hanley (accepted) ... £6,400 0 0
[Lowest of nine tenders, the highest being £8,020. Cost per head, £9 13s. 11d.]

HITCHIN—For new buildings for the Hitchin Local Board. Mr. J. Shilcock, architect:—

James... £502 0 0 ... £149 0 0 ... £645 0 0
Barker ... 465 0 0 ... 148 0 0 ... 587 0 0
Seymour & Son 465 6 2 ... 153 16 3 ... 599 9 3
Jeeves, W. ... 469 0 0 ... 137 7 6* ... 533 0 0*
Foster, M. ... 437 10 0* ... 143 0 0 ... 552 0 0
Willmott and Sons—
465 0 0 ... 150 0 0 ... 575 0 0

A.—Engineer's House. **B.**—Boundary Walls. **C.**—Store-houses.
* Accepted. All of Hitchin.

HAMPSTEAD, N.W.—For enlarging the infants' department of the Fleet-road School, Hampstead, by 116 places, and also for carrying out various improvements to the building, for the London School Board:—

Clarke and Brace ... £3,289 ... £80
Lawrance, E., and Sons ... 3,085 ... 53
Nightingale, B. E. ... 2,993 ... 68
Willmott and Sons ... 2,592 ... 59
Williams, G. S. S., and Sons, Barnsbury (accepted) ... 2,595 ... 53

A.—If brickwork be built in cement, add.
[(a) Cost of school and closets, £1,395; (b) tar paving and playgrounds, £223; (c) cookery centre, £638; (d) extra depth of foundations, £39; (e) brickwork in cement, £53 7s.; total, £2,648. Cost per head of (a) £14 12s. 2d.; total cost per head of entire school when completed, £12 8d. 3d.]

HOLBORN, W.C.—For the enlargement of the Prospect-terrace School, Grays Inn-road, by 196 places, and also for providing a playground for the girls' department on the roof of the building, for the London School Board:—

Lawrance, E., and Son ... £1,772 ... £35
Smith, J., and Sons ... 1,642 ... 38
Nightingale, B. E. ... 1,634 ... 46
Patrick, J. and M. ... 1,583 ... 35
Willmott and Sons ... 1,483 ... 52
Coxhead, F. J. ... 1,470 ... 59
Gaze, H. W., Kingston-on-Thames 1,341 ... 33

A.—If brickwork be built in cement, add.
[(a) Cost of school buildings only, £1,247; (b) works to existing buildings, £40; (c) extra depth of foundations, £54; (d) brickwork in cement, £93; total, £1,374. Cost per head of (a) only, £6 7s. 2d.; total cost of entire school when completed, £10 19s. 10d.]

HORRABRIDGE—For new Church of St. John the Baptist, Horrabbidge, Devon. Mr. George H. Fellowes Pryne, F.R.I.B.A., London, architect. Quantities supplied by Mr. R. Henry Hale, F.S.I., London:—

Trevena, W. ... £4,373 ... £4,050 ... £2
Reed and Blight ... 3,732 ... 3,468 ... £237
Berry, J. ... 3,407 ... 3,022 ... 724
Shellabeer, G. ... 3,250 ... — ... 367
Laphorne and Goad... 3,102 ... — ... —
Andrews, A. ... 2,800 ... 2,600 ... 490
Higman, W. H. ... 2,693 ... 2,468 ... 399
Blowey, P. ... 2,589 ... 2,350 ... 298
Fuge, H. B. ... 2,520 ... 2,270* ... 375

A.—Original tenders. **B.**—Revised tenders.
C.—Boundary walls. * Accepted.

INVERKEITHING, N.B.—For carrying out improvements at the waterworks for Inverkeithing and Aberdour:—
Rolland, A., Dunfermline (accepted) £591 18 7

For the supply of valves for same:—
Glenfield Iron Co. (accepted) ... 26 14 0

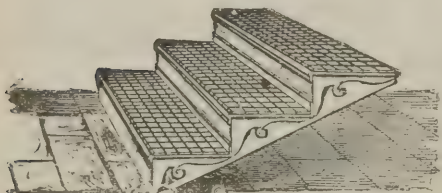
LIVERPOOL—For alterations in the basement of St. George's Hall, for the city council:—
Hughes and Stirling, Liverpool (accepted) £950.

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Accrington	Dublin	Kensal Green	Moorgate Street	Soho	Whitechurch	Police Barracks	Belfast Method-Stratford, Sal-	grave Road
Acton Green	Burdett Road	Kentish Town	Monument	South Bromley	Whitechapel	Eastney	Belfast Method-Stratford, Sal-	way Place
Aldersgate street	Burscough Junction	Kilburn	Newcastle	South Kensington	Whitefield	Fleetwood	Battersea, St. Sutton	
Algate	Burton	King's Cross	under-Lyne	Southport	Whitley	Fulwood	Mary's Church St. Jude's	
Althorp Park	Bury	King William	New Cross	Speke	Willenhall	Halifax	Birmingham, Tayport	
Altrincham	Borough Road	Street	Newport	Spring Grove	Bridge	Hamilton, Glas-	Cowper Street Torrington	
Aston	Mersey Tunnel	Langley Green	Newton Heath	Stechford	Willesden	gow	Clapham	Upton Cross
Ash Street, Stockport	Canonbury	Latimer Road	North Brentford	Stepney	Wood Green	Hulme	Colchester	Wandsworth
Birmingham, New Street	Camden Road	Lea Bridge	North Brentford	Stoke	Wormwood	Knightsbridge	Forest Gate	
Banbury	Chalk Farm	Leman Street	Northampton	Stourbridge	Scrubbs	Leicester, Glen	Parva	Hospitals.
Barnsley	Cheddington	Leyland	(Castle Station)	Stratford	Worsley	Manchest	Harrow	Belfast County
Batley	Chesterham Hill	Leyton	Nottingham	Sunderbury	Wolverhampton	Newbridge	Haverstock Hill Lunatic Asy-	lum
Bedminster	Gedley	Lidfield	Old Ford	Sunderland	Newcastle-on-	Newcastle-on-	Orphan Work-	Greenwich Is-
Bescot Junction	Chequerbent	Limehouse	Oldham (Mumps)	Sutton Coldfield	Tyne	Normanton	Jamaica Level	firmly
Birmingham	Clayton	Lincoln	Paddington	Temple	Northampton	Northampton	Leyton, Gram-Guy's Hospital	
Bishopsgate	Clifton	Little Ealing	Parsons Green	Thornon	Norwich	Portsea	mar School	Lincolnshire
Blackfriars	Clitheroe	Liverpool Road, Manchester	Piccadilly	Torquay	Portsmouth	Portsmouth	Leyton, Church County Asylum	
Blackfriars	Crooked Billet	Hammersmith	Pickle Bridge	Tower of London	Preston	Regent's Park	Newhaven	County Lunatic
Blackfriars	Level Crossing	Heaton Park	Pleek	Tring	Regent's Park	North Bow	North Bow	Asylum
Blake Street, Sutton Coldfield	Crumpsall	Hereford, Barr's Court	Plymouth	Upton Park	Salford	Old Ford	Poplar, Byron & Peterborough	Nethley Hospital
Playdon-on-Tyne	Cullercoates	Highbury	Poplar	Victoria	Stratford	Trinity	Bright Streets	Infirmary
Blatchley	Cannon Street	Holhydran Road, Wallend	Portsmouth	Walham Green	Chatham	Warley	Southsea, Rubery Asylum,	Northfield
Bolton	Daubhill	Hollinwood	Prestwich	Walsall	Cherster	Winchester	Church Path	Northfield
Bolts Bridge	Daybrook	Holyhead	Radcliffe	Waterloo	Dublin, Beggar's Bush	Woolwich	Southsea, Omega St. Thomas's	Hospital
Bombay, India	Denholme	Homerton	Salisbury Lane	Liverpool	Dublin, Island	Wrexham		
Bow	Derby	Horley	Seething Lane	Weaste	Dublin, Ship			
Bowdon Central	Droylesden	Hounslow	Shedfield	Werneth, Old-	Dublin, Ship			
Brick Lane	Dridlington	Hounslow Bar-	Shoreditch	ham	Dublin, Ship			
Bristol	Dudley Port	racks	Sloane Square	Westbourne	Dublin Royal			
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ADMINISTRATIVE BLOCK.

• THE NEWCASTLE ON TYNE •
• CITY LUNATIC ASYLUM •

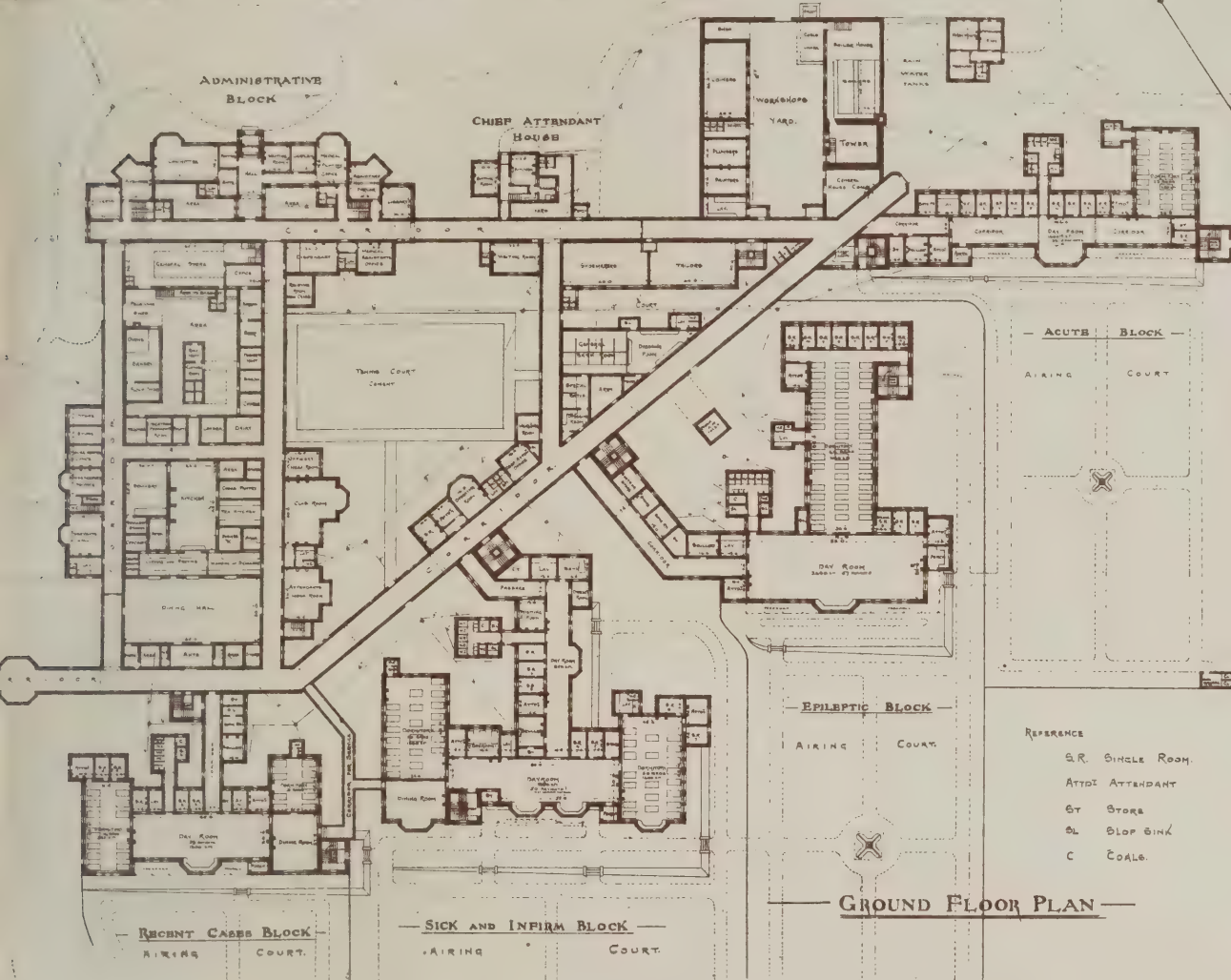
SELECTED DESIGN BY JOHN W. DYSON ARCHT



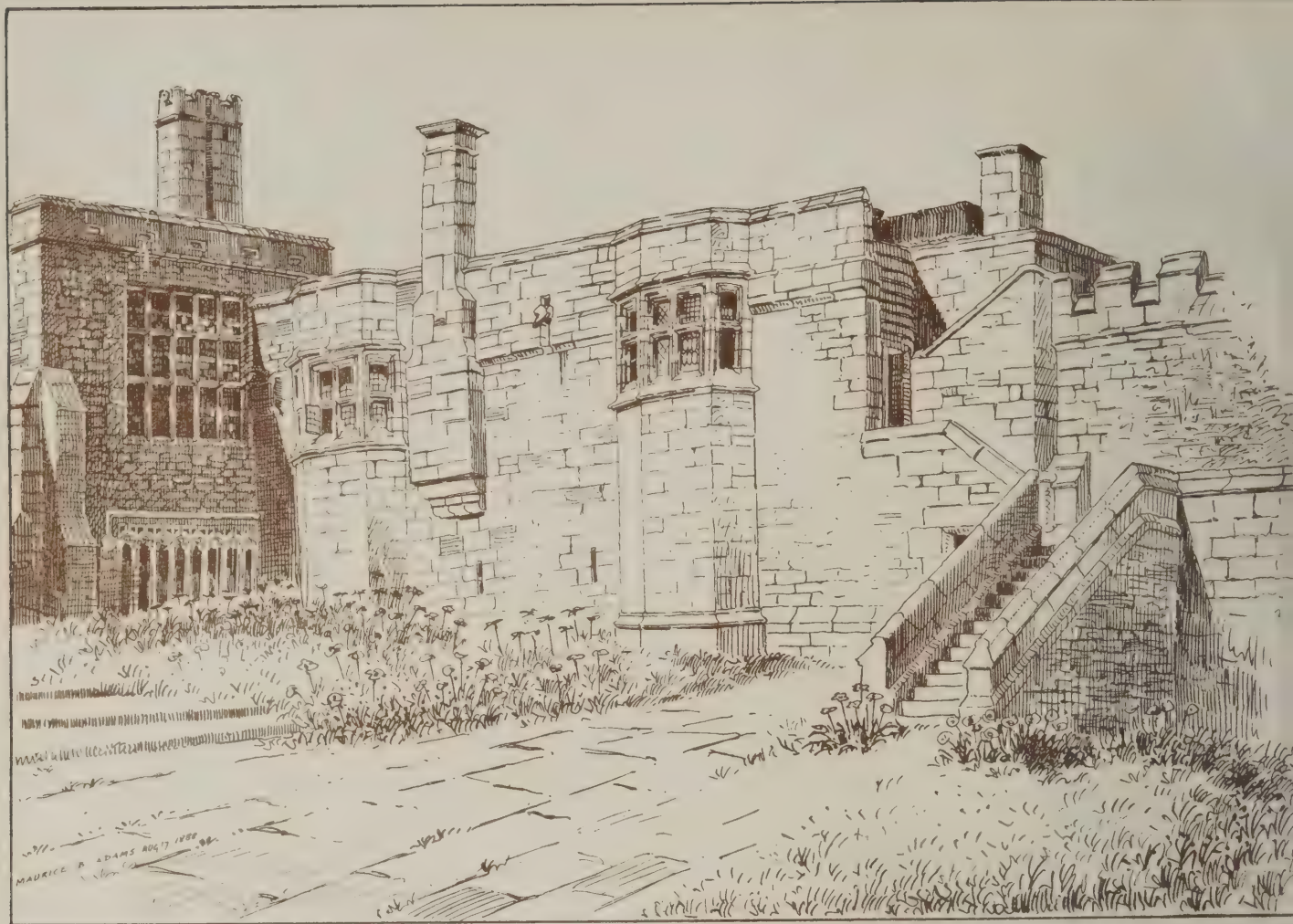
• VIEW FROM

AUG. 5, 1892.

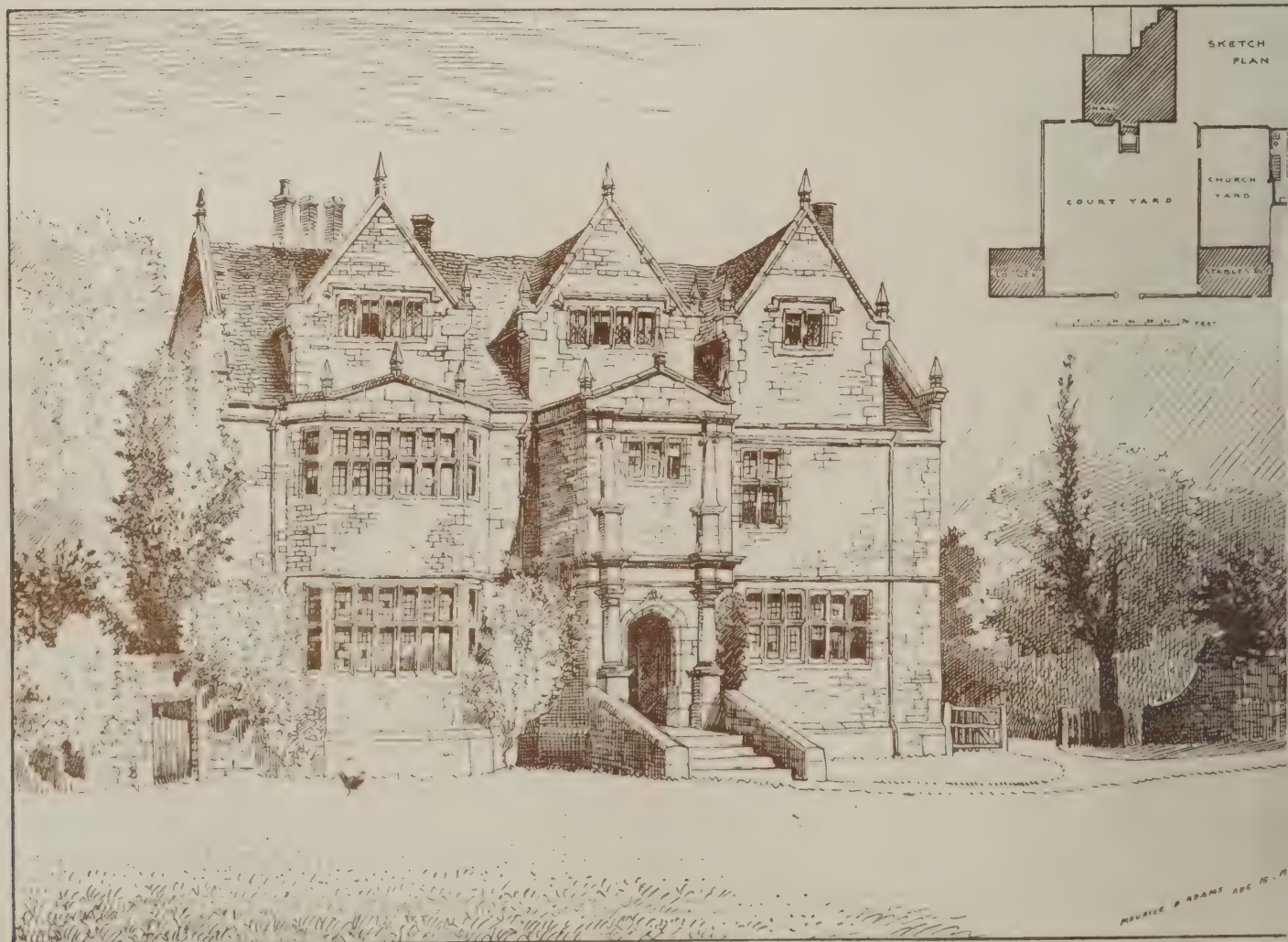
GE. ASYLUM · NEWCASTLE-ON-TYNE ·



IE · SOUTH ·



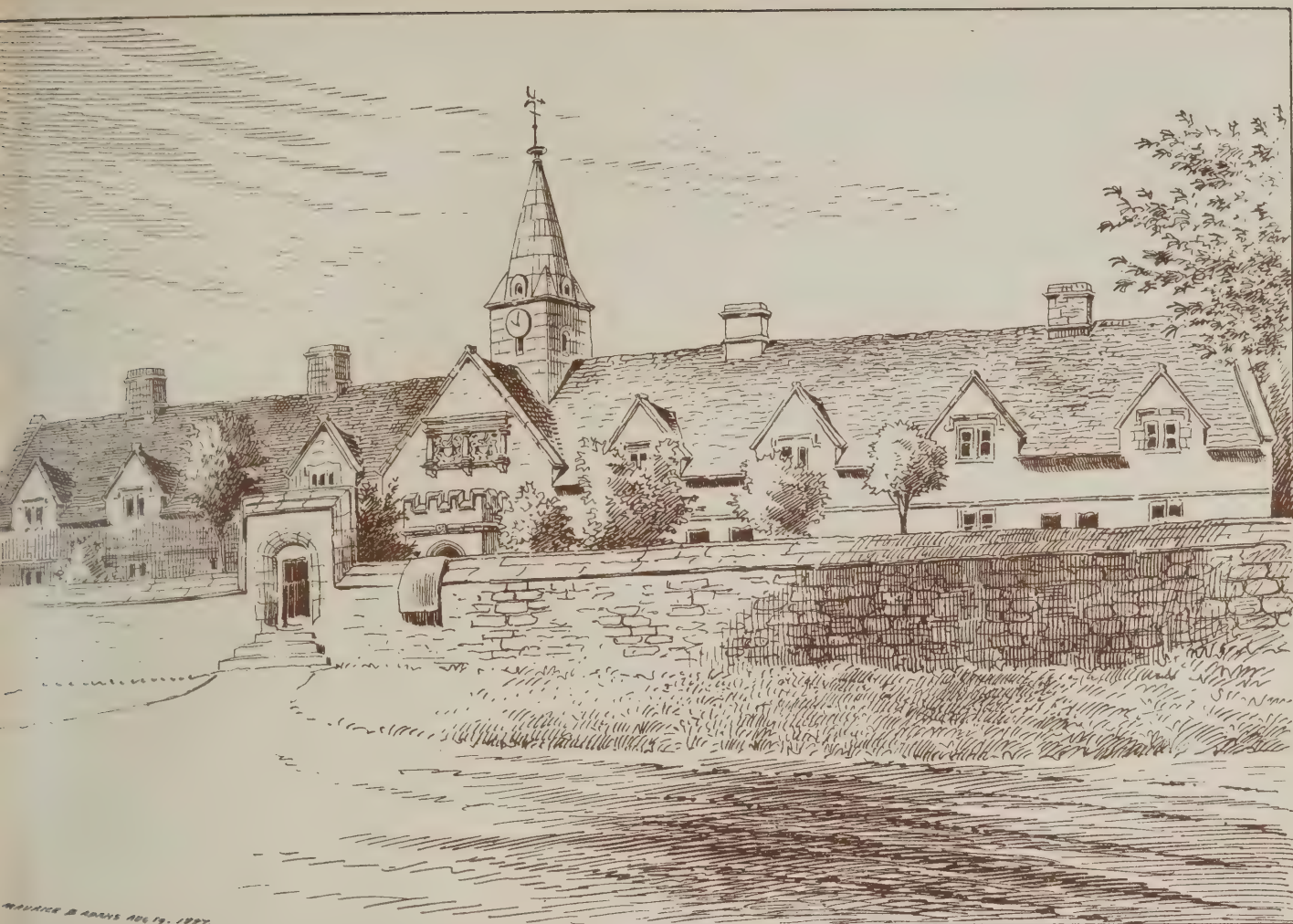
LOWER QUAD HADDON HALL DERBYSHIRE



WATER EATON OXFORDSHIRE

SUGGESTIVE DOME

SKETCHED BY MAURICE P. ADAMS



ALMS HOUSES MARSHFIELD GLOUCESTERSHIRE



SOUTH WRAXALL MANOR WILTS : ENTRANCE FRONT

THE BUILDING PEWS, AUG. 5, 1892.

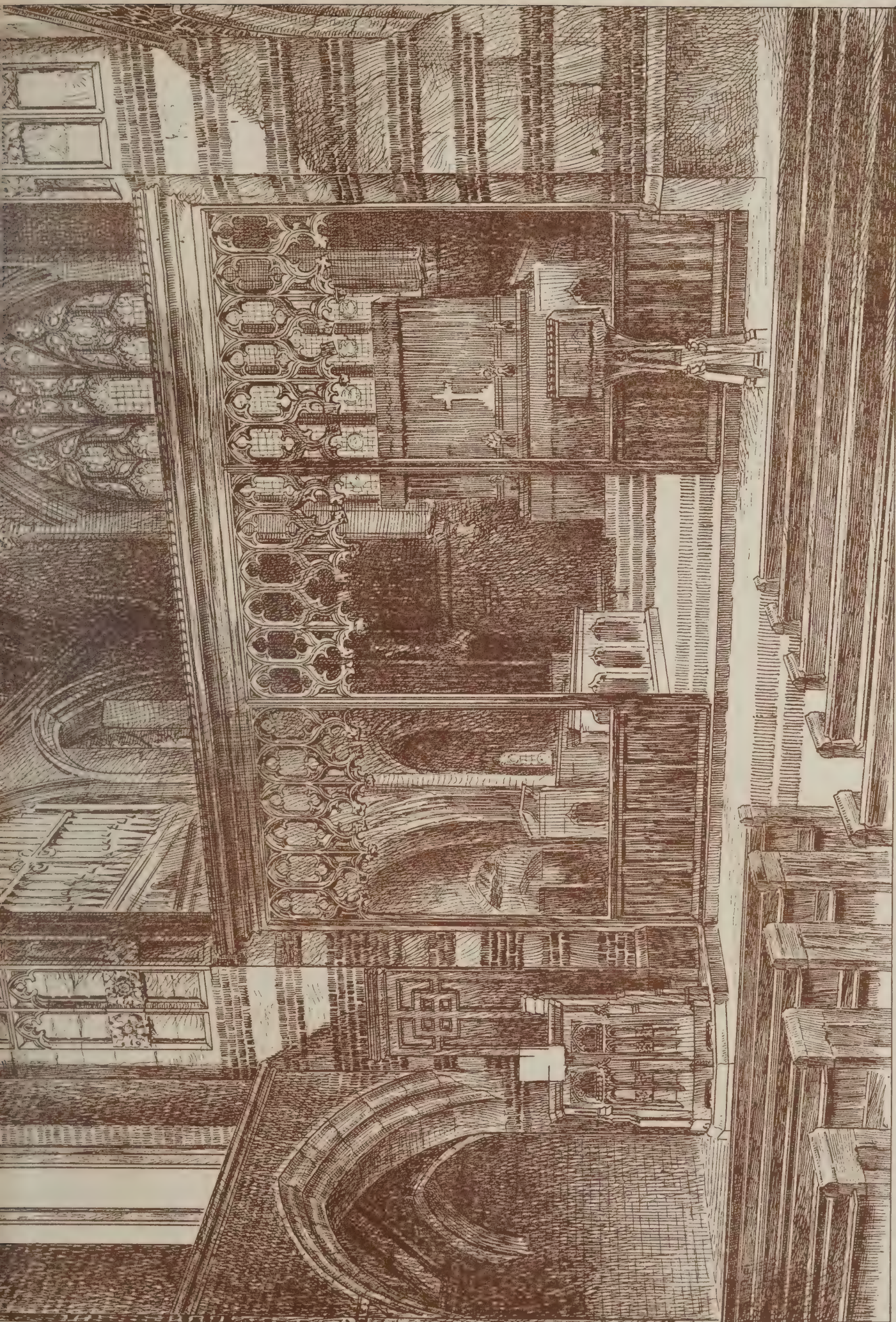
St. Augustine's Young Men's

R. K. Mill-
Freeman
P. 12. 12. 12.

1892

1892







AUG. 5, 1892.

THE YORKSHIRE PENNY BANK · BRADFORD · JAS. LEDINGHAM · ARCHT



"PHOTO-TINT" by James Akerman, C. Queen Square, London, W.C.

THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1962.

FRIDAY, AUGUST 12, 1892.

ROOFS AND ROOF COVERINGS.

IN actual execution the roof, of course, precedes the roof covering; but in working out a design it is frequently the covering which decides the shape of the roof. When once settled, it fixes at least the lower limit for the pitch, and it may even have an influence on the question of hips or gables. In olden times this influence was marked. In many districts hip-tiles were scarcely to be had; lead hips were too costly for common use, and hips made up with slates and mortar were both unsightly and insecure. This difficulty has long since vanished. Facilities for transit are, from one point of view, even too great. Materials can be so readily taken from place to place, that local peculiarities in building are tending to die out. The country, and one might almost say the world, is getting too much alike all over it, and, amongst other things, we now find tile-hips and ridges everywhere. They have, however, usefulness at least to recommend them. They supply a practical want; but this is more than can be said of all the materials which are nowadays becoming fashionable in localities to which they do not belong. Travelling has become easy; but when all places become pretty much alike, what will there be to travel for? It is time that all architects set themselves, as some have long done, to fight against this impending uniformity, and it is worth noting how many roofing materials, and how many ways of using those materials, may still be found within the boundaries of England alone.

One roof covering which is dear to painters, though hardly dignified enough for their architectural brethren, is thatch. The recent destruction by fire of a thatched village in the South of England will not help to commend it, even for cottage roofs, to the practical man. Yet, apart from its pleasant associations and its home-like look, it has merits of its own. Sir Epicure Mammon, in the "Alchemist," when he is scheming to strip the lead from the churches and turn it into gold, proposes to put thatch instead, and remarks, truly enough, that thatch will lie light upon the rafters. And it is not only remarkable for lightness, but for warmth. In the hands of a clever workman all kinds of forms can be produced in it—gables, hips, valleys, and almost everything but gutters. In the Eastern Counties it was brought to great perfection, because reeds were abundant, and were used instead of straw. We need not, indeed, expect to see a general revival of thatching, even in the remotest districts; but it would be a great pity to let the art die out, and the only serious objection, the inflammability of the straw, could in all probability be much lessened by simple means.

The use of oak shingles is almost confined to spires and *flèches*, and there they may be made extremely effective. If well seasoned and selected, they are durable; where there is a proper lightning-conductor they run little risk of taking fire; and in a certain class of work, usually unpretending, though refined, their colour and texture are invaluable. A shingled spire in a freestone county looks, perhaps, a little out of place, though one old example, at least, and by no means a bad one, may be found in Lincolnshire. On a wooden turret, however, shingles form an ideal covering. They enable the feature to be completed in the same material in which it is begun, and there is a charm in unity, although fortunate accidents may

make even patchiness attractive. Shingles, too, from their smallness, are invaluable in giving "scale." The chief objection to them is their cost. This, when the modern contractor is asked to give an estimate for them, turns out to be surprising. Perhaps the reason is that they are so seldom called for. If a country carpenter here and there, in districts where oak is cheap, would make a specialty of these roofs, he might advance his own interests, and they might be less expensive and less exceptional than they now are.

The nearest approach in effect to oak shingles is produced by excessively small and rather thick grey slates, such as still remain on a few old houses at Penzance. The architect who has not seen these houses, or something like them, can hardly imagine how much beauty is to be got out of slating. Here it is used close to the sea, for wall coverings as well as for roof coverings; and so it is also in South Devonshire—as, for instance, at Totnes. The Totnes people were more ambitious in their slating than their Cornish neighbours. They built their walls of a slaty stone, which was liable to let the driving rain through its laminated beds; to prevent this evil, they then covered the walls with slate hanging, and they experimented on this in all sorts of ways. There are slated quoins and slated pilasters, and many other Classic or semi-Classic details, slated over. They look as if a scaly eruption had broken out on the naturally smooth surface of an Italian building, and by degrees had covered it. The result is not always agreeable; but the simpler cottages at Penzance, with their slate hanging, are in this respect quite models for imitation. The artistic objections to slating are its even, mechanical surface, and its want of tone and texture. In Westmoreland green slating these objections are more or less removed. The slates are thick, to begin with. Then they vary in size, diminishing in courses as they rise from the eaves to the ridge. The colour is a pleasant one, and the surface is broken up by the well-marked and somewhat rough edges of the slates. The misfortune is that Westmoreland slates are too expensive for ordinary use. But the old cottages of Devon and Cornwall show us how we may get all the artistic qualities of Westmoreland slating, except its colour, out of some of the commonest and cheapest slates that are anywhere to be had. They are worth looking at a little more closely.

First of all, the size of the slates in general was very small indeed. Next, it often varied in different courses, somewhat as it does in Westmoreland slating. The olden slater took his slates as they came, and they did not come to him all sorted to one size, as they come to his successor of to-day. Neither did he try to reduce them all to the same gauge. He was a man, with such rudiments of artistic talent in him as most men have, or used to have, by nature. He was not a machine, like the typical modern workman, trying to do, by the imperfect aid of hands and arms, things which could be done much better and more regularly by the unerring assistance of wheels and pinions. Hence he put his mind into his slating; he fitted here, and contrived there, and considered how this part would look, and how that part would keep out the weather. Along with his small slates, a few larger ones reached him—as big as "Countess" or even "Duchess" sizes. He did not cut them up to match the others, because he had a use for them elsewhere. If his roof had hips, he worked them in there, one big slate ranging, sometimes with two, sometimes with three, or four, or even five of the smaller courses. If his roof had gables, he worked them into the verges just in the same way, and so he was able to make the verges overhang more, and protect the walls from the weather. Again, where his roof abutted against a wall

or a chimney, he first tilted it up well, to throw the water off, away from the rubble or the masonry. Then he covered the junction with a carefully executed filleting of lime and hair, or mastic, in lieu of lead, and over this he found a place for some of his strongest and most durable slates of medium size. The use of these was to prevent the water, which was sure to run down the masonry in stormy weather, from finding its way into the house through crevices at the back of the plaster filleting. To accomplish this he built them in like steps, each 10in. or 12in. long, and 3in. or 4in. in projection, a little way above the raking line which the roof forms against the wall. As the water ran down the face of the work, it reached these stepped slates, and could not pass them. Consequently it either ran over their edges and on to the roof at a safe distance beyond the filleting, or it just dropped from one projecting slate to the next, until it got down to the eaves. This was the old-fashioned substitute in cottages, and sometimes even in parts of churches, for lead flushings, step flushings, and soakers. It cost less and lasted longer. Compared with the modern slated roofs, which, with other things of their kind, so sicken the townsman of to-day that he has to run away as long and as often as he can, to forget them, these old West-country roofs were full of interest, of art, and of beauty. But we could not get them, or anything like them, by writing a clause in a specification. It takes a man to make them, and a man whose heart is in his work.

The intense ugliness, flatness, and monotony of most modern slating have driven our architects to the use of tiles. Now tiles do have some texture, some solidity, some play of light and shade over them, however mechanically they may be laid. With plain tiles the courses cannot be much more than 4in. wide, and so the "scale" of a building does not suffer by them as it does by slates of the sizes now customary. Plain tiles, too, are not absolutely flat, and their slight curvature gives variety of tone and softness of effect. In Hampshire one sometimes sees tiled roofs, perhaps to mere sheds and out-houses, which seem to have the softness and richness of velvet, even when new. Broseley tiles and others of that class look hard when first laid, and turn black, rather than greenish or brownish, by time. Tiles of a different make or of a different tint mixed at random amongst them help to prevent the deadness which comes over such surfaces. But the difficulty is to get them mixed at random. The modern slater would rather make them into patterns, or into bands, or into something else that is loud and staring. He cannot appreciate the beauty of a quietly and delicately diversified surface, and if he is not allowed to do worse, he is likely at the least to put into one mass all the tiles which you are introducing to get a little play of colour, so that he can go on with his even, mechanical task, and rejoice at having got rid of them. There are places, of course, where patterns may be welcomed. Here, in England, we seldom find them in such places; though we see them often where they would be far better away. But some of the French churches show what can be done, when that sort of doing is desirable, with both unglazed and glazed tiles of the richest colours.

Ornamental ridge-tiles are dear to the speculative builder. Like tile patterns, there is a right place for them; but that place is not where he puts them. Fortunately, they make admirable marks for stone-throwing, and it is a merit in the street-boy, which ought to hide a multitude of his sins, that he does his best to relieve us of these excrescences. Some five-and-twenty years ago quite a crop of patent tiles sprang up. They were on the pantile system, or on various modifications of it, and some of them were clever; but the weak point in all of

these was that the roof covering was only one tile thick, so that if there was a crack or a flaw in any tile the water came through at once. For the same reason, roofs covered with them were very liable to injury by workmen, and the result is not only that they are little used in new buildings, but that they have even been removed from older ones. Roman tiles, which have a separate covering piece over the vertical joints, are stronger, and less liable to injury; but English architects have found it difficult to get them properly made. And all these specimens of the pantile type have such a marked and distinctive character of their own, that they either jar with or overpower most architectural details.

We have no room to speak of lead as a roof covering. It has a beauty of its own, though in London the smoke and soot seldom let us see it. But the grey roofs of Lincoln are something to remember, and so is a quaint, old, lead-covered spire like that at Braunton, near Ilfracombe. Bleached in places almost silver-white, covered with rolls and fragments of rolls, patched up with patterns and ends of patterns, old and new, it looks like a history of North Devonshire plumbers for many generations. But their patching was surely not without expense; and in the quantity of it which has been needed we may see the reason why lead-covered spires are as infrequent as they are.

THE BISHOPSGATE INSTITUTE COMPETITION.

SIX competitive designs for the institute to be erected in Bishopsgate-street, on a scheme of the Charity Commissioners for St. Botolph Without, have been exhibited in Spital-square. The site selected is bounded on the north by Brushfield-street, on the east by Duke-street, and on the west by Bishopsgate-street, and presents a particularly irregular plot, its main length being east and west surrounded by frontage properties. Three entrances are available from the streets named, those from Bishopsgate and Brushfield streets being very narrow, and the former not at right angles to the main block, which has necessitated a rather awkward bend at the junction of the chief entrance with the main building. The design selected by Mr. MacVicar Anderson, the assessor, under the motto "Arts and Letters," is by Mr. Charles Harrison Townsend, F.R.I.B.A., who arranges the main hall, reference and lending library blocks within the irregular boundaries, and as nearly as practicable on an axis parallel to Brushfield-street. A wide entrance corridor from Bishopsgate-street gives access to the large hall about 80ft. by 47ft., with a platform recess opposite the entrance, and cloak and ante rooms on the right-hand side; to the left a wide corridor, 14ft. wide in part, returns and runs lengthwise with the hall on the Brushfield-street side, with two doorways into the hall at the side. Access to this side corridor from the entrance in Brushfield-street will also give an additional entrance to the hall. The same corridor is continued to Duke street, where there is a third entrance and staircase. Close to this entrance is the lobby for borrowers. This department is disconnected from the hall by a cross passage. The lending and reference libraries, separated by a librarian's room, are lighted by windows towards Duke-street, and from the back or south area, and the main side corridor is top-lighted by skylights and circular lanterns in the ceiling. The first-floor plan gives a newsroom, with girls' room at the Duke-street end, a reading and magazine room and room for boys attached, well lighted mainly by windows, and at the Bishopsgate-street end a board-room over the main entrance, with convenient cloakrooms and clerks' office attached. The caretaker's rooms are over the Brushfield-

street entrance. The large hall is lighted by a series of upper windows on both sides of roof; a hammer-beam type of construction is shown, with arched ceiling between the queen-posts. The elevation to Bishopsgate-street is of Renaissance design, with a circular archway to entrance, above which is a mullioned window between octagonal projections carried up and crowned with steep spirelets. There is a balcony formed between these octagons over the arched entrance, and the elevation has a steep, hipped roof, the features agreeing well with the characteristic architecture of this old thoroughfare. The Duke-street front is of plain brick character, while that towards Brushfield-street is gabled, with archways forming the side entrance to hall. These elevations are artistically treated, and the detail is fairly good. The basement plan illustrates the course of heating trunks and drains. The stairs are well arranged for convenience to the board-room and hall, and the library and hall departments are separated. "St. Botolph" shows some clever planning; the blocks are aligned in parallel lines, but the public hall is placed at the Duke-street end, with platform recesses towards the street, and is divided by a row of pillars which carry side galleries, also the main arched ceiling and hall, thus forming above the galleries lean-to roofs with lunette clerestory lights. The hall is approached direct from Duke-street and Brushfield-street; the latter entrance gives access to a vestibule between the hall and lending library. The reading-room for 300 persons, and reference-room for 52 persons, are aligned end to end on the south side, a corridor from Bishopsgate-street running between the lending-room and reading-room, and giving access to the latter, and also to the borrowers' lobby at the left-hand corner. The reference-room and reading-room are top lighted. On the first floor we have the gallery round hall, mainly top-lighted; rooms on each side of platform recess for refreshments, a book-case gallery over reference library and one round the lending library, also top lighted, a board-room in front over entrance, with office. Skylights are shown on each side of lending library, over corridor, and side area. The elevation in Bishopsgate-street is in the Renaissance style, two arched entrances and a gabled termination. The other elevations are plain. In this design the author claims direct light to all roofs which have double skylights, while extract ventilators are shown to all of them. The librarian has a room corbelled out at corner of reading-room, which enables him to supervise the leading departments on the first-floor level.

"Justitia" is clever in its blocking of departments, which are arranged in parallel lines. An entrance corridor from Bishopsgate-street leads to a lending library, 50ft. by 28ft., on left of corridor, with lobby, a reference library, and librarian's room on right of corridor. A cross hall from entrance in Brushfield-street separates the library from the hall, which latter is placed flanking that side with corridor between it and the newsroom on south side. The hall has a circular platform recess at the east end, and is 67ft. by 37ft., exclusive of platform. The newsroom is 66ft. by 30ft., is irregular, and shows iron columns supporting the outer walls above, cutting off the irregularity of site. The defect of the plan is the want of separation between the hall and library department, or newsroom. The corridors are top-lighted, and the hall is lighted by three domical lanterns and circular windows along the springing of elliptical vault. It has an iron roof. The roof plan shows the skylights, which are numerous. The elevations have scarcely any distinctive character. "Progress" is distinguished by neatly-drawn ink elevations of some refinement. The hall, 83ft. 6in. by 49ft., is at the Bishopsgate-

street end, with central vestibule and a corridor approach on each side of hall. The reading-room is at the Duke-street end, and is entered from side corridor and lobby entrance in latter street; but we do not like the shape of this room nor the columns which carry the upper walls. The hall is lighted by glazed panels in the ceiling, and by an upper tier of windows. The library is lighted at top and side, and on the whole the lighting is good. "Postage Stamp" has the hall approached from Bishopsgate-street, a large crush-room intervening. A long side corridor extends along the Brushfield-street side, skirting hall, with side entrance. Next follows the lending library, with borrowers' lobby and a reference library at Duke-street end, all entered from side corridor and side-lighted. The entrances are cleverly planned; there is clerestory lighting round the hall. The newsroom is over the library, and has skylights. The corridors are top-lighted, with side windows at areas. A want of character marks the elevations, which have Italian features. Large details of hall and ceilings are sent in with this well-drawn set. "Plan" has three distinct blocks separated by corridors; the library is placed at the Duke-street end of site, and is irregular. The public hall is central, 48ft. by 65ft., with platform on the south side; next is the reading-room, also square, 59ft. by 55ft. The hall is lighted by a circular lantern in centre. The elevations show gabled fronts of an elaborate design towards the main entrances. The scheme has at least the merit of separation between the buildings and of good lighting, a point which the competitors had to keep in view, owing to the contiguous premises requiring the rights of light to be preserved. In this respect the author of the selected design appears to have succeeded in satisfying the conditions. The contracted frontages towards two of the principal streets are unfortunate, and prevent the attainment of an architectural exterior worthy of the object and the locality—a consideration that can only be realised by the purchase of the main frontages towards Bishopsgate-street and Brushfield-street.

THE BRITISH ASSOCIATION AT EDINBURGH.

THE exciting proceedings in progress at Westminster have tended to rob the sixty-second congress of the British Association, held during the past ten days at Edinburgh, of much of its popular interest, while the papers themselves have not, as a whole, been up to the old Association standard. We published last week (p. 196) a summary of the lucid and picturesque address by the President, Sir Archibald Geikie, and propose to follow this up, as in previous years, with abstracts of a few of the papers specially attractive to our readers. Those desirous of more full reports may be referred to the last and current issues of the *English Mechanic and World of Science*.

THE DEVELOPMENT OF COAST LINES.

Professor James Geikie devoted his opening address, as President of the Geographical Section, to a consideration of the geographical development of coast lines. He dealt, in turn, with the coast-lines of the Atlantic and of the Pacific, and with the Arctic and Antarctic coast-lines of North America, and, summing up, he said they arrived at the general conclusion that the coast-lines of the globe were of very unequal age.

THE WINDINGS OF RIVERS.

Mr. J. Y. Buchanan, Edinburgh, in a paper on "The Winding of Rivers," pointed out that there was a family likeness between all rivers in regard to their windings, and apart altogether from their size. In the case of such a river as the Rhine, which for the greater part of its course ran through a broad valley, there was no external obstacle to the bends taking a larger form, and the reason why the bends did not take that larger form, but remained as they were, was

found in the mechanical laws of the motion of water. The windings of rivers he explained on the basis of the harmonic curve.

CIRCULATION OF UNDERGROUND WATERS.

Mr. E. De Rance gave in the report of the committee on the circulation of underground waters, and exhibited a map which is being prepared by the secretary of the committee for Mr. Brunner, M.P., showing how the rivers interweave with the county boundaries. The map is for presentation to the county councils and county boroughs of England and Wales, to aid in the formation of joint boards for the control and prevention of pollution of the rivers of the country.

THE TRIUMPHS AND PROSPECTS OF ENGINEERING SCIENCE.

Professor W. Cawthorne Unwin, the President of the Mechanical Science Section, recounted in his opening address some of the recent triumphs of the science and speculated as to its prospects in the immediate future. The year just passed was not, he thought, one unmemorable in the annals of engineering. By an effort remarkable for its rapidity, and as an example of organisation of labour, the broad-gauge system had been extinguished. It had disappeared like some prehistoric mammoth, a large-limbed organism, perfect for its purpose, and created in a generous mood, but conquered in the struggle for existence by smaller but more active rivals. The past year had also seen the completion of the magnificent scheme of water supply for Liverpool from the Vyrnwy, carried out from 1879 to 1885 by Mr. T. Hawksley and Mr. G. F. Deacon, and since then completed under the direction of the latter engineer. He next discussed some of the causes which had made the steam-engine inefficient, and the extent to which they were getting to a scientific knowledge of the methods of evading them. The history of steam-engine improvement for a quarter of a century has been an attempt to secure the advantages of high pressures and high ratios of expansion. It became clear from Hirn's experiments that for each engine there was a particular ratio of expansion for which the steam expenditure per horse-power was least. Professor Dery had since deduced from them that the practical condition of securing the greatest efficiency was that the steam at release should be nearly dry. The whole tendency of the conditions created by the use of steam-power had been to concentrate the industrial population in large communities, and to restrict manufacturing operations to large factories. The whole social conditions of manufacturing centres had been profoundly influenced by these two conditions—that coal for raising steam could be easily brought to any place where it was wanted, and that steam-power was more cheaply produced on a large scale than on a small scale. It looked just now as if facilities for distributing power would to some extent reverse that tendency. Just as in great towns it had become necessary to supersede private means of water supply by a municipal supply; just as it had proved convenient to distribute coal gas for lighting and heating, and to provide a common system of sewerage, so it would probably be found convenient to have in all towns some means of obtaining mechanical power in any desired quantity at a price proportionate to the quantity used, and in a form in which it could be rendered available either directly or by simple motors requiring but little skilled superintendence. He then addressed a few words as to modes of distributing power. Electrical power distribution had not yet made so much progress as might have been expected. Few persons could have seen Niagara Falls without reflecting on the enormous energy which was there continually expended, and for any useful purpose wasted. The exceptional constancy of the volume of flow, the invariability of the levels, the depth of the plunge over the escarpment, the solid character of the rocks, all marked out Niagara as an ideally perfect water-power station, while, on the other hand, the remarkable facilities of transport, both by steam navigation on the lakes and by four systems of railways, afforded commercial advantages of the highest importance. The whole steam utilised would supply 7,000,000 H.P. That was more than double the total steam and water power at present employed in manufacturing industry in the United States. The idea of a method of

utilising the Falls, capable of greater development, and free from the objections to the hydraulic canal, with mills discharging tail water on the face of the cliff, was due to the late Thomas Evershed, division engineer of the New York State Canals. He proposed to construct head race canals on unoccupied land some two miles above the Falls. From these the water was to fall through vertical turbine pits into tail-race tunnels, converging into a great main tunnel, discharging into the lower river. Apart from an inappreciable diminution of the volume of flow over the Falls, this plan avoided any disfigurement of the scenery near the Falls, and permitted a head of nearly 200ft. to be made available. It was, however, essential to such a plan that work should be undertaken on a very large scale. The present plans contemplated the utilisation of 100,000 effective horse-power, and Niagara was likely to become not only the seat of large manufacturing operations of familiar types, but also the home of important new industries.

ELECTRIC LIGHTING AND REFUSE DESTRUCTORS.

Professor Forbes made a communication on the "Application of Destructors, especially to the electric lighting of Edinburgh." He said his object was to enable the citizens of Edinburgh to see the enormous natural advantages which existed in the city and their relation to electric lighting. These advantages would enable them to obtain electric light at a price cheaper than gas, a thing that had not been possible in any town. His subject was divided into two heads. First he had to speak about the use of destructors for burning the city ash-bin refuse, and the means of using these destructors for generating steam so as to apply it directly to the generation of electricity for lighting. The natural advantages of Edinburgh enabled it to overcome one of the most serious causes of the high price of electricity in other central stations. The reason why Edinburgh was peculiarly well situated was that it had very high land in the immediate neighbourhood of the town. At the summit of Arthur Seat there was a gully looking down in the direction of Portobello, which, by means of a very short dam, enabled them to make a reservoir, which would not be the least unsightly in the neighbourhood of Edinburgh, which would be invisible in all directions from which Arthur Seat was such a magnificent object, and which could only be seen from the direction of Portobello. After that a pipe line could be taken down to Lochend—nearly a mile distant. The height of the reservoir would be 725ft.; that of Lochend was 83ft. By building a dam near the summit of Arthur Seat they could get a reservoir to a height above Lochend of 605ft., and the content of the reservoir was approximately two million cubic feet, which meant 28,000 horse-power hours on the assumption of 75 per cent. efficiency in the turbines and pipes. The cost of the pipes gave about £1 per horse-power. They could obtain a maximum output from the 28,000 horse-power in the central station of 12,500 horse-power. The use of destructors for getting rid of refuse and getting up steam for electric lighting purposes would play an important part in the future. In Edinburgh they would be able to use destructors with the utmost advantage, as the difficulty regarding hydraulic storage was done away with.

FILTRATION OF SEWAGE.

Mr. Richard F. Grantham, in a paper entitled the "Absorption and Filtration of Sewage on Sandy and other Soils," described the example of sewage irrigation in Edinburgh, Dantsic, and Berlin, and the effect on the sandy soil in each case.

FLEXIBLE METALLIC TUBING.

Mr. Gilbert R. Redgrave described flexible metallic tubing, invented by M. Levavasseur. In the tubes made it became possible to omit the rubber, and to obtain a perfectly tight joint between the metal surfaces. Figures were submitted showing the strength of various tubes, and an account given of the industrial applications of flexible tubing.

THE MERSEY AQUEDUCT TUNNEL.

Mr. G. F. Deacon, in a paper entitled "Shield Tunnelling in Loose Ground under Water-Pressure," gave an account of the tunnel recently completed under the river Mersey for connecting the Lancashire and Cheshire portions of the Vyrnwy aqueduct. The operations occu-

pled 47 months. He sketched the history of the movement, and narrated the difficulties encountered in carrying out the work. A shield might be constructed in any particular case to meet all the contingencies that could arise; but it was from works like the Vyrnwy aqueduct tunnel under the Mersey, in which the means of meeting difficulties were not sufficiently provided, and where success was nevertheless attained, that the most valuable lessons were to be learnt.

DESIDERATA IN PHYSICAL LABORATORIES.

Professor Schoute, of Groningen, gave a description of the physical laboratory there, which had been built with a view to carrying out researches in the most accurate manner possible. The chief points aimed at were: (1) The elimination of disturbances from traffic, (2) that the free access of sunlight on all sides should not be obstructed; (3) that the foundation should be firm, but without transmitting vibration; and (4) that the presence of any iron in the building should be avoided.

SOIL-PIPES AS LIGHTNING CONDUCTORS.

Mr. W. H. Preece called attention to a new danger in the destruction of lightning protectors by recent municipal legislation. He said that the immunity of private houses from being struck by lightning is very marked, and this is considered to be due to the fact that the lead on our roofs and the iron stack-pipes that drain these roofs, connected as they are together, form admirable lightning protectors. Any charge of atmospheric electricity which may fall upon a house so protected is conveyed harmlessly away to the earth. Householders are now required to remove these pipes from direct connection with the drains, and to leave an air space between the end of the pipe and the grating of the drain. The result is that the electric conduction of the pipe is broken, the stack-pipe ceases to be a lightning protector, and houses are left exposed to the danger of atmospheric electricity. The remedy is very simple. The pipe need not be entirely cut away. Three-fourths of its circular section may be removed for the distance required, and one-fourth may be left to maintain the old electrical connection; or, if the separation has been effected, then the stack-pipe should be connected with the drain by a wire or rod, so as to restore a path for the charge to the earth. Householders are also now compelled to put up stack-pipes to ventilate their soil-pipes, erecting above their roofs a metal tube forming a prominent object exposed to the atmospheric charge, and terminating frequently in an earthenware pipe on the first floor. They are thus liable to be struck by lightning without offering any means of escape. The tubes should be connected electrically with the earth, either directly or indirectly through the stack-pipes, which would then make them sources of safety rather than of danger.

THE IMPURITIES OF TOWN AIR

was the subject of a paper by Dr. G. H. Bailey, read in the Chemical Science section. During the past twelve months the Air Analysis Committee of Manchester, in conjunction with the Royal Horticultural Society, has been engaged on the analysis of the air of large towns. A large amount of information having been already collected by previous observers as to the carbonic acid in the air, it was thought desirable to devote more special attention to such impurities as sulphurous acid and organic matter. Furthermore, since the object in view was not merely to collect data, but to lay the foundations of what may be termed chemical meteorology, the atmospheric conditions prevailing at the time of the observation have been noted. From the results of several hundreds of analyses carefully conducted in London, Manchester, and Liverpool, the following conclusions are drawn:—1. That in clear, breezy weather, the amount of sulphurous acid is less than one milligramme per 100c.ft. of air. 2. That in anticyclonic periods it rises very considerably, and in times of fog maxima of 34 and 50 milligrammes have been recorded for the worst districts of Manchester and London respectively. 3. That wherever an open space or a less densely-populated area occurs there is a very marked diminution in the amount of impurities in the air. 4. That an increase in the amount of sulphurous acid is accompanied by at least as large an increase in the amount of organic impurities in the air. 5. That smoke, promoting as it does the formation

of fog, and preventing freediffusion into the upper stratum of the air, must be regarded as the principal cause of the impure state of the atmosphere in large towns.

THE TAXATION OF BUILDING LAND.

A paper by Mr. Mark Davidson, "On the Taxation of Building Land," dealt with three proposals—(1) the taxation of ground rents; (2) assessment of unoccupied land capable of yielding ground rent; (3) acquisition by the community of the unearned increment of land. He said that as to the first the question is one of assessment, and especially the method of assessment adopted. The rent of ground already pays rates equally with the rent of houses. To tax it additionally would be to alter the principle on which rating proceeds, and would tax lands of identical values at different rates. On the other hand, the second proposal is in keeping with the system of local rating adopted for vacant land, which, being exempted from rating, is treated differently from other real property. The third proposal is the most complex, because it is not a matter of taxation, but of the acquisition of property; and the difficulty of the problem consists in the fact that it is desired to appropriate real property without assuming the right to administer it.

REPORT ON GRAPHIC METHODS.

Prof. H. S. Hele-Shaw, University College, Liverpool, submitted an abstract of a second report on the "Development of Graphic Methods in Mechanical Science." He pointed out that there was scarcely a treatise or publication dealing with mechanical science that did not employ some kind of graphical expression as a means of exposition or calculation. Graphic methods really included every way of representing numerical quantities by means of drawing, except the representation of actual bodies and purely geometrical construction. A study of the list of references to graphic applications in scientific literature of this country appended to the report showed that gradually, but with an ever-increasing rate, it had become the custom to employ representations of numerical results graphically, and to suggest and use the solutions of various problems by graphic methods. These two purposes: (1) Representation of results by means of plotted curves and autographic diagrams; and (2) solution of problems by graphical methods, seemed to suggest a satisfactory way of dealing with the subject. The difficulty of ascertaining what subjects in mechanical engineering had been treated graphically in current literature was very great. Nothing less than an examination of every page of engineering journals and scientific papers sufficed for the purpose, since no intimation was usually given in the index. The scheme of the report was described under four headings: First, geometrical considerations involved in the representation of results graphically, and in graphical calculations; second, the representation of results; third, graphical solution of problems; and fourth, classified list of reference to graphical methods.

Next year's meeting of the British Association will be held at Nottingham, and Dr. Burdon Sanderson will deliver his presidential address on Wednesday, September 13. Oxford has been selected as the meeting place for 1894.

THE ARCHITECTURAL ASSOCIATION EXCURSION.—I.

[WITH ILLUSTRATIONS.]

ON Monday next this annual excursion will commence proceedings from Taunton, where the London Hotel is to make the headquarters of the party. We printed an outline of the programme on the last Friday in July, and by way of a prospective description, we intend to-day to give some few particulars of the district, concluding with a description of Dunster, with its church, castle, and old houses. Both the Quantocks and the range of the Brendon Hills are, of course, beyond the limits of Exmoor, with its wild uncultivated grandeur and lonely charms; but the irregular line of the Quantocks, rising away towards the sea north-west of Taunton, with their breezy slopes bare or partly covered with trees, comprise scenery of a kind second to none on Exmoor itself, and far superior to the tamer delights of the Brendons—"Hilles that renne in crestes from Quantok-hedde towards Tauntown," and are almost now as wild as when Leland thus

described them in his "Itinerary." The crown of the westernmost heights of the Brendons assumes an almost dead level belt of unbroken heather-land, which becomes monotonous when seen for miles over the wooded slopes and graceful combs on either side, at once lacking the wild magnificence so peculiar to Exmoor. These hills are Devonian in formation, and the new red sandstone of the lowlands is remarkable as a fertiliser, where farms are famous for prosperity. This stone, known as Keuper, was largely used for building, as at St. Mary's, Taunton. Between the Quantocks on the east and the borders of Devonshire on the west, there must be at least, according to the best authorities, no less than thirty old manor houses erected during the days of the Tudors now used as farmhouses. Many of these old manorial homes have chapels or oratories in situ still. Lower Marsh, near Dunster, is a specimen, with its little prayer-closet over the porch, a veritable Mediæval dwelling. Between Minehead and Stower, running some fourteen miles alongside of the Bristol Channel, there are twenty-two more such houses still remaining. A great feature in the larger number of them is the elaborate plasterwork both to fireplaces and ceilings, and even in cottages, which never at any time seem to have been other than very small dwellings, some of the most exquisite specimens of this kind of work are to be found. Thus at Stamford Brett there is a beautiful ceiling in a cottage well worthy of a more ambitious building. Timber was freely employed for arched doorheads and the tracery of windows, and, like the screen work and bench ends throughout Somerset, is detailed often in the most elaborate and admirable manner. The Tannery at Minehead, Bratton Court Farm, and a cottage at Lynch, near Porlock, are capital examples of this use of timber. West Somerset boasted of three religious houses—namely, the Cistercian Abbey of St. Mary of Cleve, and the Priors of Barlynch, near Dulverton, and Dunster. The greater part of the first named exists, consisting of a refectory of exquisite design, a dormitory, common room, chapter-house, cloisters, and offices. These will be seen on Tuesday, and illustrated by us next week. Barlynch was a small Augustinian foundation, instituted by William de Say in the 12th century, but only two crumbling walls are now standing. Dunster possesses nothing more than the priory barn and dovecote. The churches are famous throughout the county for their Late, and sometimes "Flat," detail characteristic of the Perpendicular period, which in this immediate district is scarcely so rich in the detail of stonework as in other parts of Somerset. Bishop's Lydeard has, however, one of the grandest towers in the county, and, of course, St. Mary's at Taunton is among the most celebrated in England, rising as it does 153ft. to the parapet, and elaborated to a degree. Wrington tower ranks perhaps the finest in Somerset, then that of St. Cuthbert at Wells, after which comes St. John's, Glastonbury. Evercreech, Cheddar, and Huish Episcopi have all remarkable towers, and so has Middlezoy, which is of another type. That of St. Mary's at Taunton is wanting in the graceful proportions and harmony of scale which mark the designs of its peers. The overbearing dimensions of the pinnacles on the cresting, needlessly elongating the almost detached lantern, give a top-heavy appearance, which is more conspicuous when seen on the angle than in direct elevation. The base hardly spreads sufficiently to indicate a spire-like growth, so essential to good effect, while lateral breadth is lost by the introduction of double windows to the three upper stages. Inside the church is very handsome, the double row of columns to the nave arcade being unusual and effective. The screens, pulpit, and organ-loft deserve mention.

Turning now to Dunster, the excursionists will see, adjoining the very scanty remains which still exist of the once famous Benedictine Priory of "Dunestora," the spacious and beautiful parish church of St. George, which, until 1499, was used in common both by the people as well as by the monks. The Abbot of Glastonbury was at that time called over to arbitrate between the two factions, who had for a long while contested the right of equal use of the building. The decision thus arrived at here, as elsewhere, was that the parish altar in future should stand west of the rood screen, under the western arch of the central tower, leaving the choir and transepts for the clergy. The monks soon had to give way, how-

ever, for the Dissolution, conducted on what we nowadays should call the Progressivist policy, soon set the cowed worthies to the rightabout, and "the hole church of the late Priory serveth now for the parochie churche—afore tymes the monkes had the est parte closed up to their use." Subsequently to Leland's time, when he thus wrote of the place, the church became greatly neglected, and in fact was closed entirely for a long time. A few years ago the building was, however, renovated and restored by the late Mr. G. E. Street, R.A. The chancel, long used as a private chapel of the Luttrells, is of Early English character, with simple lancets, but the rest of the church is mainly of the Perpendicular period, with embattled walls to the nave and south porch. The tower, which rises to a height of 90ft., contains some good bells, and on the wall the "Articles of Ringing" are intended as a corrected list of punishments reserved for contumacious bellringers, whose fines for the most part were stipulated to be expended "in cyder or in beer." Inside the church there are some tombs, the principal one being the canopied altar monument to Sir Hugh Luttrell and his lady, who died respectively in 1428 and 1433. This tomb in general character bears some resemblance to the Harrington Monument in Porlock Church. The curious archway between the south transept and the choir, herewith illustrated to-day, exhibits one of those curious alterations, if not original bangles in buildings, sometimes found in specimens of old work. The general explanation is that the archway was increased in width during the 15th century, and the corbels were inserted at the springing of the earlier arch as we now see. The dark oak screen is interesting, as is also the chantry with its altar stones, and the Decorated canopy, too, over the effigy of the Everard lady, whose remains rest against the south wall of the presbytery. The font, sculptured with the emblems of the Passion and the five sacred wounds, deserves mention, and in the churchyard stands the stump of a 13th-century cross. In Church-street, on the way to the castle, is an old plastered and timbered dwelling, once the home of the priest, but now occupied by the vergers. "The Nunnery," further down the road, bears a more decidedly ecclesiastical and picturesque appearance, with the tiled penticies which divide the stories of the building, and enhance its antique effect, surmounted as it is with lofty gables and steep roofs. The name given to the house is seemingly quite recent, and even within the present century the "High House" was the common appellation. Now it is divided into cottages, but formerly was known as "The Tenement of St. Laurence," from the fact that the revenue of the chantry of St. Laurence was derived from the property. Although the fancy kerseymeres once known as "Dunsters," long enough ago ceased to be fabricated here, the old, quaint Yarn Market-house, still standing in the midst of the main street, serves to remind the passer-by of the days of James I., for the building dates from 1609, and at that time an Act of Parliament refers to the cloths just alluded to, which were then as famous as the worsteds in Norfolk. One of the massive angle posts of this old building, too, bears the unmistakable mark of one of Blake's cannon balls in connection with the historic incidents of 1646. The Abbots of Cleve once resided hard by in the old tavern, which possesses a porch of 15th-century date, and has the credit of belonging long ago to the beforementioned priory, founded by the Mohuns soon after the Conquest. The "Luttrell Arms" anyway, is a very old house, with indications of the original chapel still discoverable, while at the rear of the premises the earthworks of the Roundheads remain to tell the tale of their siege of the castle under Blake. Upstairs the oaken gabled room has some features of more than ordinary interest, and in another apartment the typical plaster chimneypiece has figures in Elizabethan dress, as well as a coarsely-modelled nude form represented attacked by hounds, and commonly thought to impersonate Actæon. Some have considered that the composition had its origin in the character of Lazarus undergoing the attention of the dogs, who had more mercy than their master. The castle, now known as the princely home of Mr. Luttrell, incorporates all that remains of the masterful stronghold originally erected by William De Moion, great baron of the Cotentin, who received the manor with sixty-

seven others in the West of England, from William the Norman. One of this same family of Mohuns, as they came to be called, held the castle against Stephen. The present owners bought the estate in 1376, on the death of John de Mohun, the eighth baron. The lady who thus acquired the property was Elizabeth, daughter of Hugh Courtenay, Earl of Devon, and widow first of Sir John de Vere, and afterwards of Sir Andrew Luttrell, of Chilton, a cadet of the Barons Luttrell, of Irnham. She was, too, of Royal descent, and related to Edward III., and, moreover, had great wealth. Her son built, most likely, the great gate-house. The Luttrells shared their influence with the Lancastrians; but during the wars between Charles and the Parliament the family sided really with neither party, and were out of favour consequently with both. In 1643 the Royalists took possession, and Charles had a chamber for his own use in the house. Three years later Blake's attack, which we have already spoken of, took place, and a few iron cannon balls, memorials of this siege, have been preserved. Sir Francis Wyndham, who was in command of the Royalists, surrendered the castle on the 19th of April, 1846, after holding out for six months. Alterations of the buildings from time to time have been made, but generally so with a view of material improvement to the place, such, for example, as the raising the surface in the lower ward to probably 14ft., with earth obtained by scarping the adjacent slope of the tor. This involved the closing up of the old gateway, and no doubt was combined with the construction of the new approach, which passed below and outside the gate-house, wound round the castle and the tor, and entered the lower ward at the new level. The keep was probably either circular or polygonal, and, like Lincoln, was approached by a direct flight of steps from the lower ward. The gateway, which belongs to the days of Henry III., has recently been restored as far as may be, and gives access by steps to the lower ward. The great gate-house still remains perfect, and makes an appropriate entrance to the mansion. It was erected, perhaps, by Henry Stone, in Henry V.'s reign. The principal, or second floor, has lately been converted into a handsome hall with an open roof. The summit is embattled, and at the four angles are turrets. The Luttrell arms rule everywhere. When Mr. George Luttrell came into possession of the property in 1864, he enlarged the Elizabethan mansion and added a new tower to the west front from the designs of Salvin. The fine hall and staircase of the house are rich in carving, and grand plaster ceilings exist in both, dated 1681. The plaster chimney-pieces in some of the rooms are of the curious kind found at East Quantock Head House, and in very many old residences, both large and small, throughout the district. The Italian painted leather hangings in one of the rooms, representing the diversions of Antony and Cleopatra, are unusual, and generally are known erroneously as "tapestries" in local descriptions. The paintings in the house include Vandyck's famous portrait of Cromwell, some Opies, pictures by Sir Joshua Reynolds, and others. The present south front was built about 100 years ago. The view towards the sea includes the park, which extends from Minehead to below Chrampton. Inland the prospect is one of exceeding richness, limited and sheltered on the south and west by the graceful table-tops of the Brendon Hills, and the high ground rising beyond Dunkery Beacon towards Exmoor. The vales of Cleve and Williton nestle to the east, bounded by the Quantocks. Seaward, again, to the north, the eye ranges over Bridgwater Bay to the headland of Brean Down and Worle, and commands the west or opposite coast from Penarth Point to Aberavon and Swansea. "The scenery is neither colossal nor overwhelming." "It is infinitely beautiful and picturesque"—

"Bold, rising on an insulated height,
With deep encircling woods, all verdant crowned,
Thy Castle Dunster! proudly meets our sight."

Dunkery Beacon, the highest point of Exmoor, is the weather-glass of the district—

"When Dunkery's top cannot be seen,
Horner will have a flooded stream."

Dunkery was never, it seems, a British fortress, and no remains upon its summit exist beyond the beacon and the ruined fire-hearths' scattered stones. There are no ruined castles in this part of the country, with the exception of Castle Mount at Stowey. Those who visit this district

and go on towards the Doone Valley, the Forest of Exmoor, and away southwards to Dulverton, should not fail to read Mr. John Lloyd Warden Page's "Explorations of Exmoor and the Hill Country of West Somerset." It is a most delightful book, full of information, by one who knows the country and loves its beauties, describing them with knowledge and enthusiasm, cultured by taste.

"BUILDING NEWS" DESIGNING CLUB.

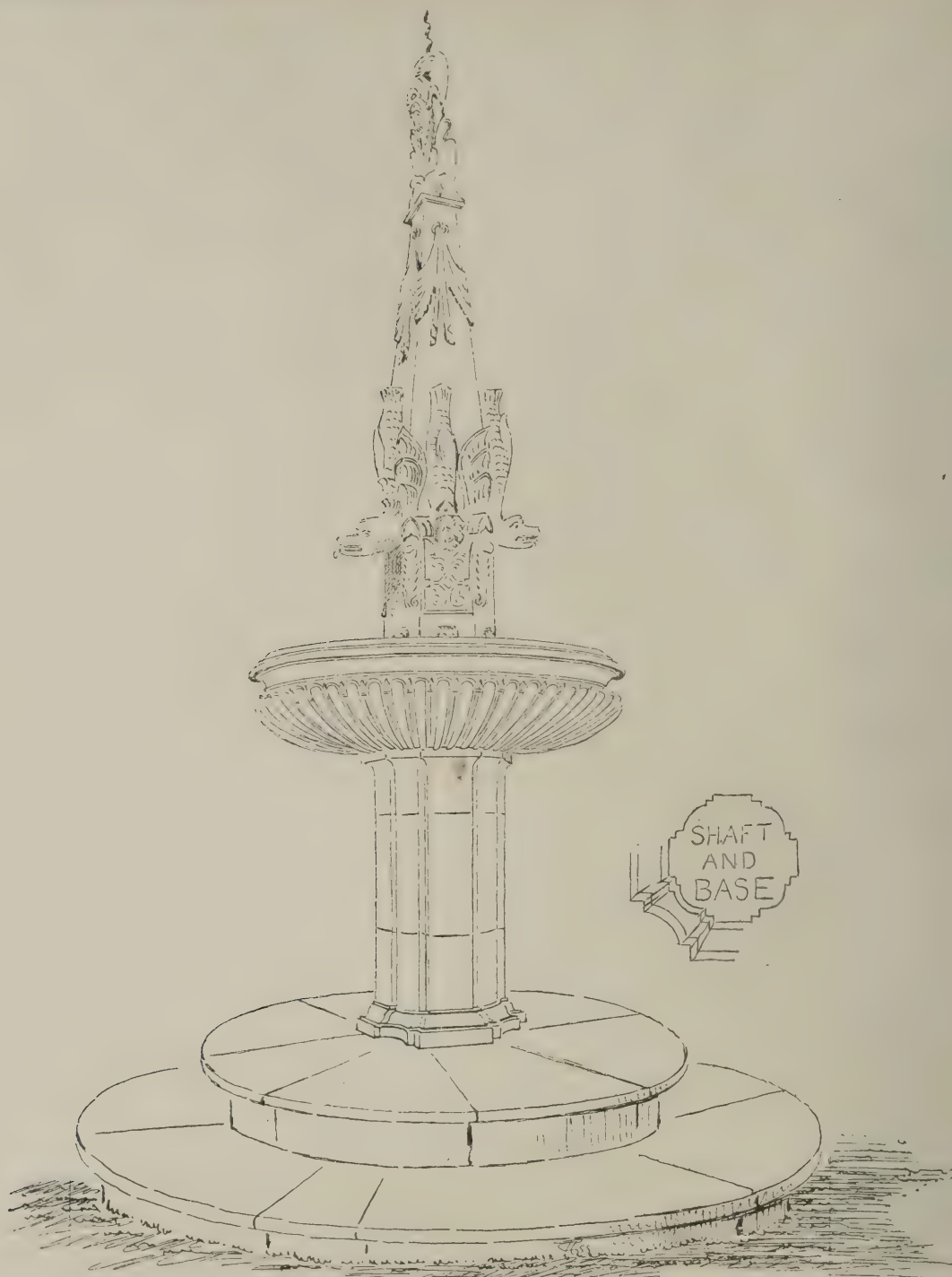
A SEASIDE BATH HOUSE.

IT would be difficult to name a more seasonable subject, just as everybody is turning their attention to holiday-making, and many are enjoying their leisure by the sad sea waves, than a bath house for a watering-place. All must have seen the shockingly ugly, and for the most part exceedingly inconvenient, buildings which hitherto have done duty in various parts of the country in not a few small towns along the coast. At Brighton, Scarborough, Bournemouth, and other fashionable resorts, large bath houses, of course, have been erected years ago; but in the majority of the less important seaside places the accommodation which exists of this kind is extremely inadequate and out of date. We therefore thought it might serve a useful purpose if our Designing Club contributors would show what might be done in the direction of artistic treatment and convenient planning for such buildings. We publish the result herewith to-day, awarding the first place to "Vulcan," the second to "Smilash the Goth," and the third to "Unitate Fortior." The following are the conditions of the problem which we set with the above view. Whether others would have solved it more satisfactorily or not must be an open question; but we fancy that "Vulcan" has produced a capital design, which, with a few modifications, would make an excellent building.

"A Seaside Bath House for a small Watering-place.—The site is situated with a frontage towards the parade running at the top of the beach. It is 100ft. long by 45ft. deep, part of the depth to be reserved as a garden or grass forecourt. The accommodation to comprise two sets of six slipper baths supplied with hot and cold sea-water—one set for ladies and one for gentlemen; a drying-room for airing towels, and a small room or office for the attendants (two females and one male). The entrance hall to be commodious enough for waiting-room purposes. A verandah may be put partly along the seaside front. Each department is to have two w.c.'s and a lavatory basin. Provision to be made for a storage cistern at roof level. Elevations in stones and slate roofs. Building to be on one floor. Style bold and simple, suitable for an exposed situation. No skylights. Scale 8ft. to the inch. Plan may be 1/4th if desired. Elevations, section, and view."

In criticising the plan, it is necessary to follow the provisions thus set forth. The entrance hall, for example, was intended to be available for waiting purposes by both ladies and gentlemen. Some may think that separate entrances are desirable, and with plunge-baths or institutions of large size it may be so; but economy of working is essential in small undertakings of this kind, and by the sea, where men and women frequently take their morning dip in machines immediately adjoining each other, with a numerous assembly of spectators on the beach, it must be a piece of Mrs. Grundyism of the worst kind to fancy that decent folk cannot meet in a common waiting hall attached to a bath-house like the vestibule in "Vulcan's" plan. We name the subject because many correspondents wrote to us asking if we really intended such an arrangement. The ticket-office in "Vulcan's" design faces the entrance, and right and left run the different baths. The drying-room for towels is conveniently located, and the cistern comes in a squat kind of tower over the hall very prettily. The verandah, with its kiosk-like alcoves at the ends, would be very comfortable both in fine as well as shower. The simple and sturdy appearance of the whole composition seems well adapted to seaside exposure, and the building looks like a bath-house. "Smilash the Goth," too, deserves praise, but is a trifle too ambitious with his stone arches to the verandah, buttresses above, and apsidal transept-like bays, of which no use is made in the upper part. The boiler-house and drying-

room are practically considered, far more so in fact than by "Vulcan," who omits the flue from his heating-chamber, which we understand to be under the central part, though it is not delineated. The passage in this plan is between, dwarf divisions separating the baths, thus allowing a better circulation of air, but we lose privacy, which is a necessity, especially for baths used occasionally by invalids. "Unitate Fortior" in some respects is better than "Smilash the Goth," and makes a point with his scheme for ventilation by means of a through trunk from end to end. We presume it is intended to be so over the cistern in the middle part. This, on examination, is hardly so clear as might be wished. The arched, cloister-like verandah is badly proportioned, the arch-stones running up into the frieze, and the design architecturally wants overhauling: the student needs the master at his elbow. Two ticket-offices in the building are needless. If men and women can meet in the hall with impunity, the tickets for males and females won't surely go astray in one office. The hit-and-miss arrangement to the baths, by which a recess for clothes is managed, shows thought. The perspective, however, exhibits no skill, and presents the building in anything but a pleasing manner. "Firefly" is clever, but, like most clever people, cuts capers with endless breaks and dodges. His perspective cramps the front, unfortunately. It would be twice as long as here appears, and would be quite 50 per cent. better. "Firefly" should try more simple methods. He has ability: it requires cultivating and moderating. "Newfardi" at least is simple, but he is not too fond of light. The passages between the baths would be dark, and so would the two little waiting-rooms. There is no verandah to this design, which we place here mainly for its breadth of treatment. Its detail is crude and careless. "Nil Nisi Bonum" cramps his baths too much, and overwhelms the design with the huge central block, where the planning is inconvenient and wasteful, without any notion as to how the working of such an institution is to be carried on. The verandah is of wood, and very slight in construction. "Umbopa" puts a central octagon, which lights the assembly-hall; but it isolates the administrative department into two parts so entirely, that the male attendant has to go into the female corridor every time he wants some dry towels. There is no ticket-office, and the verandah takes the form of a portico. "Umbopa" lets his octagon run away with him, and then finds it so tall within, that he has to erect a sort of conservatory inside, with opaque glass, to hide the roofing over. Externally the effect is not so bad. "Black Prince" endeavours to be original, but he plans shockingly and draws but poorly. The masher drawn in the doorway exhibits at once the hideous proportions of the opening. The plan illustrates how the doors would clash in the ugly lobby inside the angle. "Black and White" gives his quiet design a school-like appearance. The lavatory and w.c.'s adjoining the entrance vestibule would be hardly available with comfort for either sex, as they are so very public, and the hall would be quite dark. "Graham," no doubt, is original, with an attempt after the eminently severe. Sturdiness we like; but then there must be no trumpery detail. The wasteful treatment of the hall, with its alcove for hiding old pot flowers in, to fade and look unpleasant; the attendant's office, with the circular bay like a lady's thimble in proportions, cut off from the working department; and the crowded-in verandahs, go far to spoil his design. "Sweet Auburn" is very neat. He gives his pay-office, with the cistern over it, a big three-light window, large enough for the end of a Baptist chapel. The central hall is commodious, but no real convenience is provided for the proper working of the baths. The attendants' rooms are mere closets, as if these people were put away out of sight till rung for, whereas they have to do the work of the establishment. "Cyclist" gives us a gimcrack harlequinade of a building, and copper balls poised on iron pins along the sky-line make capital cock-shies from the beach. The plan is very crude, and great sacrifices are made to the big octagon hall, with its high conical roof, in which tanks are to be stored, but no one knows how they are to be reached. The other designs are by "Box," "Symbol," "Sphinx," "Perseverando," "La Cigale," "Excelsior," "Don Quixote," "Ivanhoe," "Sector," "Old Stamp," "Peterborough," and "Zingarella."



RAVELSTON-HOUSE-FOUNTAIN

THE CASTELLATED AND DOMESTIC ARCHITECTURE OF SCOTLAND.

THE fourth and fifth volumes of Messrs. David MacGibbon and Thomas Ross's instructive history of the castellated and domestic structures of Scotland continue the descriptions of the remaining edifices of the "Fourth," or last, period, and bring the narrative down from the 12th to the 18th century. Through the kindness of the authors we are enabled to present our readers with two double pages of illustrations from this work. In our last notice of Vol. III. we sketched the classification adopted by the authors of this valuable historical and graphic record, and mentioned a few of those castles and mansions which mainly took the form of the L in plan. Those edifices were simple keeps, and are very numerous, outnumbering those of the types now described, and distinguished as the Z, T, E, and

courtyard plans. The three former types are found mainly in the smaller buildings; the Z-plan, having round or square towers at the extreme angles, was adopted during turbulent times, and was intended to afford protection; next, the T-plan is described as a convenient form for giving separate access to two rooms on each floor of an oblong house by means of a single wheel stair contained in a square or round tower projecting from the centre, while the E-plan was a main block of oblong proportion, having a central tower and stair approach flanked by a projecting wing at each end, and as a more symmetrical arrangement was followed during the "Fourth period." But the buildings designed on the L and courtyard plans were most popular at this period, as will be seen in going over the list of structures given. Of those of the Z type, described and illustrated by plans and sketches, may be mentioned Craigcrook Castle, Midlothian, near Edinburgh, which has been much altered by additions, to adapt it for domestic purposes. The oblong portion or main

block is about 30ft. by 23ft., one round tower at the south-west angle is 20ft. in diameter, and the square tower at the north-east angle 17ft. square. The exterior presents many of the interesting features of this class of castle, such as the circular stair turrets or bartizans corbelled out from the angles and conically roofed, the crow-stepped gables, one of which crowns the square tower. Riccarton House, in the same district, has square towers, and has evidently been converted from the L-shaped block. The staircase turret is introduced, as usual, in the re-entering angle of the east wing. Dargavel, Renfrewshire, is also a remodelled mansion, with circular stair turrets at the opposite angles, and a fine piece of corbelling to angle turret. Of the same type is Dairsie Castle, Fifeshire. Square angle towers occur at Arnage Mansion, Aberdeenshire; Keith Hall, and at Castle Menzies, Perthshire—the last a structure of considerable size and of several stories; this latter is noteworthy as showing the development from the keep to the domestic residence in the 16th century.

* The Castellated and Domestic Architecture of Scotland, from the 12th to the 18th Century. By DAVID MACGIBBON and THOMAS ROSS, architects. Edinburgh: David Douglas.



MONTROSE PANELS.



FROM AN OLD HOUSE
NEAR MONTROSE
NAME NOT KNOWN
SKETCHED IN A
BROKERS' SHOP
AT EDINBURGH
OCTOBER 1881

DOOR PANELS ARE
22½ INCHES X 6½ INCHES

One of our illustrations (p. 206), taken from Messrs. MacGibbon and Ross's work is an interesting fountain from the garden of Ravelston House, Midlothian, one of the structures of this form, which was destroyed by fire early in the present century, except a staircase tower with stepped gables. The fountain is a unique specimen, and has the date 1630. From the top of upper step to the under side of basin it is 2ft. 8in.; to top of same, 3ft. 9in.; and to top of unicorn on summit, 9ft. 10ft. The diameter of basin is 3ft. 10in., and the shaft 15½in. diameter. "Above the basin the fountain is ornamented with dolphins, through whose mouths the water flows from a hollow cistern inside the stone at the thick part beneath the dolphins. The fountain contains the same initials as the doorway and fireplace, twined together in three love-knots." The fireplace, now turned into a summer-house, is another of the relics illustrated in this work belonging to the old hall, and is a fine example of moulded and enriched jambs and mantel; the outer ornament is a Greek fret, and the inner hollow is filled with square rosettes and a small intervening member of dog-tooth ornament. The cornice is enriched by carving, with a monogram of the owners, George Foulis and his wife Janet Bannatyne.

The E type of plans illustrated comprise a few important structures more or less mutilated. Wallyford, Midlothian, is a fine example, with a good doorway pediment and several details, which are of the Renaissance period. We give one example from Stirling, Cowane's Hospital, a representative of a simple 17th-Century building. As the authors say, "with some infusion of Renaissance, it still preserves a good deal of Scottish character." The central tower forms the entrance, and it once contained a staircase. The middle niche above entrance contains a statue of the founder of the hospital. A tablet over the door contains the inscription: "This hospital was erected and largely provided by

John Cowane, Dean of Gild, for the Entertainment of Decayed Gild Breither. John Cowane, 1639. I was hungrie, and ye gave me meate; I was thirstie, and ye gave me drinke, &c." The hospital is now converted into a guildhall for the meetings of the gildry. On the T-plan several interesting examples are given: Grange-pans, Linlithgowshire; Old Leckie House, Luffness Castle, Haddingtonshire; Lauriston Castle, Midlothian; Queen Mary's House, Jedburgh. Those are distinguished by less of the keep or fortress, and more of the residence character, the staircase turret, or tower forming the projection from an oblong block. Many important plans illustrate the courtyard type. Holyrood Palace is a well-known quadrangular arrangement, several views of which are given. George Heriot's Hospital is another splendid example of the courtyard plan, also well illustrated by some brightly-drawn sketches by one of the authors. Glasgow College, lately demolished, was also a very interesting instance, and both of them are fine examples of the Renaissance style as developed in Scotland during the 17th century. Four periods of this type are distinguished by Messrs. MacGibbon and Ross. During the castellated times a central courtyard was the form round which the buildings were extended, either before or after the introduction of the keep. The third period commenced in 1400, when castles were designed on this plan, and this continued during the fourth period. We have given in one of our double pages a sketch of Hatton Hall fireplace as a remarkably characteristic example of Renaissance. It is constructed of wood, and is in the centre room of first floor of this very interesting old mansion. Pollok Castle, Renfrewshire, is remarkable for some fine specimens of Renaissance gateways and courtyard details. The entrance gateway, shown by a sketch (p. 221), is dated 1694, and we give, as one of our double-page illustrations, a perspective view of the gateway in south wall, interesting for its elegant outline, inverted and

ramped parapet. It gives entrance to the flower-garden, and is the centre feature of the wall, which is terminated by pavilions at the S.E. and S.W. corners. These erections are of later date than the building, which was damaged by fire in 1882. As one of the last of the courtyard class, we may mention Dunrobin Castle, plans and sketches of its present state being given. Some exceptional types of buildings of later date are given. We are enabled to give one or two details. One is a fireplace in a private room, Carnassery Castle, Argyllshire, which exhibits a very elegant form of ornamentation, consisting of fine baluster-like shafts moulded with horizontal members. The drawing we give is a restoration from existing remains.

The "altered and fragmentary" examples of houses form another large class of structures.

We give a sketch in the text of some interesting details of oak door and panels found in a partition of an attic in an old house in Montrose, taken down in 1878. They were brought from Abbot Panter's Hospital, a demolished building (circa 1516). The door measures 5ft. 9½in. high by 3ft. 3½in. wide and 1½in. thick, and the size of panels is about 22½in. by 6½in. It is said to be one of the best pieces of wood carving in Scotland, though whether native or not is unknown. The five panels we give are from 18 found framed in two rows. The centre panel at the top represents fanciful birds resembling those in the foliage of capitals in the Chapter-house of Arbroath, believed to have been built by Abbot Panter. The grotesques, it was supposed by the late Mr. John J. Reid, F.S.A., represent swine dressed as monks, and indicate a pre-Reformation date. The upright stiles are carved. In the door the stiles are decorated with small niches and traceried windows.

Not the least interesting volume of the series is the last, which completes the houses in towns and other omitted structures, and con-

prises descriptions of tolbooths and town-halls, churches and monuments, and Scottish sundials. They illustrate the transition of Renaissance. The accounts given of early Scottish masters of works, master masons, and architects of the Fourth period are valuable contributions to architectural history, and will be read with interest by all who wish to understand the early superintendence of buildings. Very few of the old town houses survive, and many of the illustrations given of them are reproduced from old drawings and prints. We have little space to enter into this part of the author's work. The series of townhalls or tolbooths have many picturesque features, as those of Forres, Tain, Dingwall, Canongate (the latter erected in 1591), especially the towers, which are massive and crowned by octagon lanterns, angle turrets corbelled out, and other forms of roof. The churches are especially of interest, and some good illustrations and details are given of Torpichen, Stirling, Pittenweem churches. We confine our remaining remarks to a few of the fittings of these churches. One of our illustrations represents the pulpit of Fenwick Church, Ayrshire, with its huge projecting sounding board, one of the few remaining examples. The building was erected in 1643. The front of pulpit is circular, and the panels are filled with minute flat ornament. The large sounding-board and carved wings and hour-glass on iron stand, are features of interest, and were common at one period of Scottish church architecture.

A very remarkable example of the internal fitting up of these churches is shown in our adjoining illustration. It represents the grandiose family gallery situated in the north aisle of Kilbirnie Church, and is constructed of oak, for John, first Viscount Garnock, between the years 1703 and 1708, the year of his death. This gallery and its canopy occupies the full width of the aisle projecting into the church, abutting against the east gable. The central portion is convex in plan, and projects about 2ft. beyond the sides. The front portion is occupied by the proprietor and his family, and the portion behind is separated by an open screen (see sketch). Four columns, with capitals and convoluted fret-work, distinguish this pew. A higher screen behind separates the gallery from the entrance passage. The projecting canopy is canted and follows the curved front, the panels of which are filled with armorial bearings, while the canopy has in the centre the family arms or achievement. These are described in detail. But the chief interest is in the elaborate and gorgeous structure itself, so significant of the 18th-century love of family display in churches whose higher functions were then subordinated to family distinctions and personal comfort. The whole design has the appearance of a royal box in a theatre.

On the upper left-hand corner of the same page we reproduce the fine Montgomery monument, erected by Sir Robert Montgomery in 1636 in the old church of Largs, the aisle of which is still preserved. The monument stands in the aisle or north transept of the old church, and is a good example of Renaissance. It was joined to the structure by an open arch, and the aisle has a barrel vault of timber, boarded and divided by ribs into compartments painted representing the old Castle of Skelmorlie, Largs Church, and emblematic and heraldic devices. A plan of the monument and details are given in Messrs. Macgibbon and Ross's work, from which it is seen that the monument consists of a gallery raised by a few steps above a partially-sunk basement, which forms a tomb-house, the door to which is seen in the view. Many similar monumental structures are illustrated, but of less architectural interest, such as the Lauderdale, Haddington, and the Bruce in Carlross Abbey church. The Aberdeen Mercat Cross, designed and built by John Montgomery, mason in Old Rayne, Aberdeenshire, in 1686, stands in the centre of Market-place, Aberdeen, but it has been removed from its original site. It measures 21ft. across, and is 18ft. high to the top of the parapet, and about 12ft. 6in. more to the Corinthian capital. The twelve panels of the parapet contain medallions of the Stuarts, beginning with James I., and the Royal arms and those of Aberdeen. Montgomery was both designer and builder, and the work was erected from a model of timber and pasteboard.

The other sketches we give illustrate sundials: a fine one from Newcastle Abbey, Midlothian,

where there are two dials exactly alike, which stand in the gardens on the east of abbey. The dial is octagonal. Four of the spaces are filled with coronetted initials of William, Earl of Lothian; those of the countess, the arms of the earl, and a figure of the sun, the family crest; the other spaces have dials. The total height is 16ft. from top of upper step. The design is, as suggested, rather too much after a goldsmith's model. The last is a very remarkable and quaint design from North Barr, and the sundial stands in the centre of the old-fashioned gardens of North Barr. The figure is picturesque in its 17th-century prim costume and head-gear, the grotesque-looking hair curls are intended to give strength to the neck, which supports the overhanging sundial, the latter of which is octagonal, with 17 faces. On the upright faces the dials alternate with cup hollows. The height of figure is 3ft. 11 $\frac{1}{2}$ in., of figure and dial 5ft. 3 $\frac{1}{2}$ in., steps 8in. each, and the whole is wrought out of grey freestone. North Barr was for generations in the possession of the Stewarts of Darnley. These sundials form a very interesting section of the work; the variety in the design is remarkable, and it was a happy idea to conclude so important a work on Scottish edifices with an illustration and description of these very artistic accessories of castles, mansions, and churches. The authors have, in fact, classified their materials and treated the subject with the completeness it deserves. The sketches given are numerous—over 200 examples are noticed; they are well selected for the peculiarity of their design, and include those attached to walls of buildings and those disengaged, both of these main groups being treated. The former appear on walls, on gables, corners of houses, over archways, &c., and these are often designed to form part of the building and to become very architectural accessories, as at Heriot's Hospital, Alloa; some are corbelled out, others built in as a quoin-stone, but set crosswise. The detached class are quite as varied, and are divided into obelisk-shaped, lectern-shaped, facet-headed, and horizontal dials. Some of the lectern-shaped are remarkable for their shape, as at Woodhouselea and Ruchlaw. The facet-shaped are also ingenious and ornamental treatments, as at Haddington, Glamis Castle, and those we have illustrated. We congratulate the authors, Mr. David Macgibbon and Mr. John Ross, on having completed their arduous undertaking. As an illustrated record of Scottish architecture planned on a scientific basis, these volumes form a valuable contribution.

THEATRES.—IV.

By ERNEST A. E. WOODROW, A.R.I.B.A.

A THEATRE should be divided, considering the nature of its contents and the class of business carried on in the building, into three principal parts, which should again be divided and subdivided into many other parts, in order to effectually meet the requirements of theatrical management. The three larger divisions of a theatre are the approaches, the auditorium, and the stage. As, in this chapter, we have only to deal with the means of separating these particular parts of the building, it is needless to dwell at present upon the subdivisions contained therein.

To be a safe building a theatre should be so substantially built that any portion of it would withstand a sudden shock or a great additional strain upon any of its parts; it has been said that structural weakness in any part of a theatre which has to contain a large number of the audience, whether moving or stationary, is dangerous in the extreme, and should be guarded against by all possible means. The external walls should be strong and solid, and the cross-walls should be well bonded into them. The chief cross-walls, which in a theatre are quite as important as the external walls, are those which contain the three principal divisions, and separate the approaches from the auditorium, and the auditorium from the stage, the latter being commonly called the proscenium wall. The work these walls have to perform is to create separate fire divisions or risks, like the water-tight compartments of a ship, and in order to do that they should be carried up through the roof of the theatre as well as down to the level of the footings of the main walls; there should be as few openings in them as possible compatible with

carrying on the business of the house, and the provision of egress therefrom.

In the new regulations of the London County Council, there is a full description of the manner in which that body requires the architect who builds within their jurisdiction to design and carry out this portion of the theatre. It is enacted that in all such premises where a stage with a proscenium is erected, such stage must be separated from the auditorium by a brick proscenium wall not less than 13in. in thickness, and such wall must be carried up the full thickness to a height of at least 3ft. above the roof, such height being measured at right angles to the slope of the roof, and must be carried down below the stage to a solid foundation. Not more than three openings are allowed to be formed in the proscenium wall, exclusive of the proscenium opening. No openings must exceed 3ft. in width and 6ft. 6in. in height, and each of the openings must be closed by a wrought-iron door not less than $\frac{1}{2}$ in. in thickness in the panel, hung in a wrought-iron frame so as to close of itself without a spring. No openings formed in the proscenium wall must at the lowest part be on a higher level than the floor of the stage.

In New York the proscenium wall has to be carried up higher than in London—i.e., 4ft. instead of 3ft.—and Captain Sir Eyre M. Shaw advocates from 4ft. to 6ft. as necessary. New York has another provision not included in the London regulations; there the proscenium opening must be arched over by fireproof materials, or an iron girder covered in fireproof materials, to protect it from heat; and if a girder is used a relieving arch is required to carry the superstructure. The custom in England varies; some architects prefer a wood girder of large balk surmounted by a relieving arch, while others employ an iron girder with or without the arch over; but there is no doubt, whatever material is used for the girder, there should always be a relieving arch over to distribute the weight of the high wall above, the wing walls of the proscenium forming the abutment.

The height of the proscenium wall in London must be governed by the fourteenth regulation of the London County Council, which provides that the height of the wall plate carrying the rafters of the roof over the stage must not be less than twice the height of the proscenium opening, such height being measured from the level of the stage at the curtain line. The object of this is, of course, to allow the scenery to be lifted up out of sight without rolling or folding, thus avoiding the great danger of the cloths coming in close proximity to the hanging gas battens. The necessity of this was seen by Saunders a hundred years ago, for he says: "both above the scenery and below, the heights should be increased. Instead of 6ft. or 7ft., the height usually given under the stage, I would propose 20ft. or 30ft. This would give opportunity of much assistance to the machinery, and on either side the carpenters' and painters' shops might be placed communicating with the stage by trap-doors." One is, however, rather surprised, after reading these words, to find the latter part of the above sentence. I suppose, as I hope to be able to point out hereafter, a worse position in the whole building could not be found for the carpenters' and painters' shops, than under the stage floor. With regard to the additional height proposed by Saunders, modern requirements for stage display have demanded and introduced this, and where the stage is not far below the level of the street, such depth can with ease be given to the "mezzanine" and "cellar" below the stage. This, of course, adds to the depth of the proscenium wall which divides the mezzanine of the stage from the orchestra.

The decorations or enrichment of the proscenium opening must be constructed of fireproof materials. The New York laws require that if the moulded frame round the proscenium opening be of metal, it shall be filled in solid with non-combustible material, and securely anchored to the wall with iron. Whatever material is used, the solidity of the construction is, of course, of immediate importance. Carton pierre is a favourite material, but of late marble has been much used in decorating the opening. In treating the proscenium opening from an artistic point of view, it must never be forgotten that it is but the frame for the living picture represented on the stage, and it must, neither by form nor colour, detract from the stage, but be a setting to the picture.

The width and height of the proscenium opening are the key to the whole interior of a theatre. From tables of dimensions of various moderate-sized theatres, it is found that 30ft. is about the average width of the opening. For the safe and convenient working of the stage, the outer side stage walls must be, at the very least, 60ft., or twice the width of the proscenium opening—in fact, a somewhat greater width of stage is required for the convenient manipulation of the scenery “sliders” and “bridges.” With a stage opening of 30ft., the slides are 30ft. wide, and it requires rather more than 15ft. more to take off the “sliders” on either side. Now, as the width of the proscenium opening determines the width of the stage, and the position of the main side-walls of the stage, so it will be found that the width and height of the opening govern the location of every seat in the auditorium. This will be further explained in a forthcoming chapter on the sighting of the auditorium. No house is a good one unless a good view of the stage can be obtained from every seat. People pay to see, and it is vexatious not to get what one pays for. As the square or frame through which the picture is to be seen is limited in size, so the radiating sight lines must be governed, and these lines determine the pitch of the seating of the various tiers, both at the sides and in the centre of the house.

But I am drifting away from the subject immediately under consideration—namely, the division walls of the three main parts of a theatre. The wall dividing the auditorium from the corridors at the back and sides must of necessity be pierced by such openings as will give access and egress from the corridors to the seats, and the number and position of these must be governed by the number of people seated on each tier or division of the audience. To effectually create a fire-resisting division between the auditorium and the corridors, one would naturally require a heavy fireproof door made to close of itself. This, however, in the auditorium would become a matter of impossibility and extreme danger to the public, as self-closing iron doors which are in frequent use are a source of danger and annoyance, inasmuch as they often jam the fingers of those passing through them. The constant jarring and banging of heavy doors in an auditorium would effectually put a stop to any serious artistic performance on the stage; the ordinary wooden swing doors are bad enough as it is. The fire-resisting doors described in the revised laws relating to the construction of buildings in the city of New York are allowed in that city to be constructed of pine or other soft wood, of two thicknesses of matched boards at right angles with each other, securely covered with tin on both sides and edges, with folded lapped joints, the nails for fastening the tin being driven inside the lap; the hinges and bolt, or latches, being securely fastened to the door after it has been covered with the tin. Where such doors are used they should be hung upon an iron frame, independent of the woodwork of the doors, or on two iron hinges securely fastened into the masonry. A door built up in this manner would, it appears to me, be light and suitable for use between the auditorium and the corridors, for it would retard the spread of smoke or fire from the auditorium to the corridors for some little time. A door of hard wood or asbestos in an iron frame would also be effectual up to a certain point; in fact, a door of any material would be better than no door at all, with perhaps the exception of doors with glass panels.

Another phase of the question naturally arises when one has to provide sufficient means of retarding the spread of fire through the prescribed and necessary openings in the proscenium wall. Here the doors are not constantly on the swing, and during the whole time of the performance should, with the exception of the orchestra door, be always kept locked. Heavy doors of fireproof materials are therefore admissible and desirable in the proscenium wall, and when they are provided on both sides of the wall to each opening, a double protection is insured.

The number and size of the openings in the proscenium wall, in addition to the large or stage opening, are restricted in London by the regulation of the County Council already quoted in full.

Speaking from a fireman's point of view, the late chief officer of the Metropolitan Fire Brigade advocated openings in the proscenium wall at the level of each tier. These openings would necessi-

tate iron ladders on the stage side of the wall to overcome any difference of level that existed between the floors in the auditorium and the floors and flies of the stage. With increase of openings there must be increase of fire risk, and although it might be desirable for the fireman, should there be only one employed in the theatre to have access from stage to auditorium at various levels, yet that difficulty would be overcome by firemen being stationed in the auditorium in addition to those on the stage.

It would appear useless to protect the smaller openings in the proscenium wall while the stage opening was left with only the act drop or green baize to divide it from the front of the house; a fireproof or rather fire-resisting curtain of some description is absolutely necessary, and in all new London theatres this protection is now enforced by the rules of the London County Council. For some years past this provision has been made on the Continent, and doubtless the authorities at home would have compelled a like provision of safety had the powers been vested in them to do so to all theatres.

Of the patterns of fireproof curtains which have of late years been introduced, nearly all are fixed on frames, which by various powers are raised bodily above the opening. This, of course, necessitates the height of the proscenium wall being twice the height of the proscenium opening, with a space from the top of the opening to the underside of the roof equal to the space from the stage floor to the underside of the proscenium arch or girder, in order that the curtains may be raised without rolling, folding, or sliding in sections. In old theatres this height is not often found; and this may be accepted as a reason why these curtains are difficult to provide in old buildings.

The thirteenth regulation of the Council which deals with this point is a new one as far as London is concerned; but long before its enforcement several fire-resisting curtains had been erected in the newer theatres of the Metropolis, notably in the buildings designed by Mr. Phipps and Mr. Emden.

The rule reads that the proscenium opening shall be provided with a fire-resisting screen to be used as a drop-curtain, of such pattern, construction, and gearing, and with such arrangements for pouring water upon the surface of the screen which is towards the stage, as may be approved by the Council.

There have been many forms of curtains advocated, but none that can claim to be fireproof, nor does there seem any likelihood of such a curtain being devised, without increasing the weight so as to render its use in a theatre impossible. It has been said by the best authority that the opening should be protected by means of a metal curtain which could be dropped at a moment's notice, and that this curtain should be supported and worked by steel or iron chains. “Such curtains, it is true, have before now been tried, and have not found favour with managers of theatres; but that does not at all affect the subject under consideration. They may have been badly made, badly fitted, or badly worked; but even so, it must be obvious that, in the event of a fire happening, they would have done some good.”

Since these remarks were made, there have been other views expressed on the subject, notably those of Mr. Max Clarke, A.R.I.B.A., who has introduced into several theatres a curtain designed by himself. This curtain claims to be an improvement on the wrought-iron plate curtain, which has been found defective, as it twists and buckles under great heat, and allows the passage of smoke and flames into the auditorium. Its inventor describes its superiority over those made of the wire-gauze, which are fragile and apt to break with the weight or contact of falling bodies; the asbestos curtains, which are easily torn; the canvas and water-spray curtains, which depend upon mechanic means for their efficiency, or the water-curtains, through which smoke can penetrate. The protected iron curtain designed by Mr. Max Clarke is an open iron and wire frame, covered by silicate cotton or slag-wool on each side. The silicate cotton is covered with wire netting, and is said to form an absolute non-conducting material, which can be covered on the auditorium side with the green baize, or be treated as an act-drop.

There is a form of asbestos curtain manufactured by the United Asbestos Company which appears to have been used in several provincial

theatres, as well as in two London playhouses. The asbestos cloth of which it is made is fixed to an iron frame in panels by hoop-iron and bolts every 6in. This curtain is also designed to adapt itself to theatres where there is not sufficient room above the opening to allow it to be taken up whole, and is constructed with the lower part hinged to fold up. In the fire at the Queen's Theatre, Manchester, in 1890, the roof of the auditorium fell in and the centre part of the theatre was completely destroyed before the fire was extinguished; the stage portion was, however, it is stated, saved by the lowering of an asbestos curtain. This is a practical proof of the use of a fire-protecting proscenium screen.

There is yet another fire-resisting curtain before the public—one manufactured by Messrs. John Stones, Limited; the framework of which is made of light L iron or T iron, with suitable stays from the corners to the centres to procure rigidity and to keep it in the square. One side of the frame is covered with thin corrugated steel sheets, lined on one side with silicate cotton, which is pressed or padded in the corrugations and covered over with iron or steel network, which is secured to the steel sheets. The manufacturers claim that their invention has an advantage over the asbestos-cloth curtains, inasmuch as it will not show any signs of fire through the outer sheet being kept cool by means of the silicate cotton packing, which is said to repel the heat; the asbestos curtain, they state, although fireproof, will be liable to cause panic by the glaring appearance it gives when attacked by fire. Another quality claimed for this particular screen is that it is said to be sound-proof, and should any excitement prevail on the stage, the noise would not be heard by the audience.

Doubtless there are several other forms of curtains in the market of various merit; but the foregoing descriptions are sufficient to illustrate the various forms and materials employed. Whatever form is adopted, it should be in constant use, for by this means there is an assurance that the apparatus is in working order, and the fear of alarming the audience by its unexpected descent is avoided. Such a curtain, if the audience are unfamiliar with its appearance, coming down in the middle of a performance would be but the signal of alarm. The fire screen should be so fitted as not to permit the flames or smoke to pass between it and the proscenium wall, and in New York, the law compels it to be fitted in iron grooves built into the brickwork, and extending 6in. into the grooves.

In Brussels, the curtain required is a metallic one or other apparatus “sufficient to intercept the passage of smoke, and to prevent fire being communicated between the stage and auditorium.”

In St. Petersburg, the curtain must be stout, durable, and non-inflammable, so that in the event of fire it will not easily bend by the weight or pressure of gaseous vapours, nor break by the falling of the scenery upon it, nor allow the smoke to pass in such quantities as to be dangerous to human life, or be destroyed by the great heat at the outbreak of a fire; it must be so constructed as to be easily let down without danger to the man in charge of its working.

In Hamburg, the permanent decoration of the proscenium must be fixed close to the iron curtain, and in Paris the wire gauze curtain demanded must be hung with combustible cords and counter-weights on metal ropes to check the too rapid descent. The Mons Board of Works advocate a water curtain, and in Antwerp metal curtains are required. From this it will be seen authorities differ widely as to the material that should be employed.

SANITARY SPECIALITIES.

MESSRS. THOMAS CRAPPER AND CO., sanitary engineers, of the Marlborough Works, Chelsea, S.W., have just issued a new catalogue and price list of their special manufactures, fully illustrated and brought up to date. The index to the well-bound volume indicates the large variety of the sanitary fittings and appliances made by this well-known firm. Amongst these we notice first the very excellent “Improved Kenon Trap,” suggested by Professor Corfield, M.A., M.D., to which we have before drawn attention, and which in face of other inventions still holds its own as a trap which allows the rapid discharge of sewage with

The least friction, on account of its egg-shaped section with ready access for cleansing. Architects and sanitary experts cannot do better than specify the "Improved Kenon" disconnecting trap for house drainage. The trap is made to 4in., 6in., and 9in. sizes, and the prices quoted are exceedingly moderate, for a 4in. glazed stoneware trap the price being only 8s. 6d. The channel pipes and junctions for manholes, white glazed, are all figured, and their radii and prices given on p. 13, thus saving time and expense in ordering. We lately spoke of the admirable sanitary air-tight frames and covers for manholes made by this firm, which seem to give all that is required; the covers of these can be ornamented by tiles to match paving. Several sizes are made, and they can be painted or galvanized. The air-tight joint is simple and effective, no hinges being required. Next we come to several improved forms of glazed stoneware grease-traps, designed for use with the automatic flushing tank. The section of invert is egg-shaped, and they are made circular or square, with galvanized iron air-tight cover. Messrs. Thos. Crapper and Co.'s improved automatic flush-tank for flushing drains, made to hold from 30gals. to 100gals., has the great merit of giving a rapid and powerful flush, and every system of house drains should have one. Improved gully traps, and improved closets of various types, are illustrated. One of the most effectual and cleanly is the "improved elastic valve closet," with white china top and dish in one piece. It has a flushing rim basin, and the overflow is kept clear and siphonage prevented. Several patterns are made, some of very moderate price. Crapper's improved siphon water-waste preventer is quite an artistic improvement upon the ugly box type, which architects ought to note, and on p. 49 it is shown fitted to an ornamental flush-down closet. We must also mention Crapper's automatic seat-action closet, well adapted for hotels; their "wash-down" closet, with patent lead connection; the "flush-down" combination closet. The "silent siphon water-waste preventer" is a clever adaptation. We also note the improved wood seat for pedestal closet; the self-rising seat, adapted also for a slop-receiving closet, and various improvements in basins and traps, sinks, and lavatories. Ball-valves and taps, cocks, tanks, cisterns, boilers, and r.w. goods are included in this comprehensive price-list of sanitary fittings, which ought to be in every engineer's, architect's, and builder's office.

BOOKS RECEIVED.

Scientific and Technical Papers of Werner von Siemens, Vol. I. (London: John Murray, Albemarle street).—This volume of scientific papers and addresses, translated from the second German edition, is of much interest to the scientific reader. The collection of papers now published for the first time in this country comprise a variety of subjects of special value to electricians and engineers, but far too numerous and abstrusely scientific for us to deal with in these columns. The first paper, written in 1845, on the "Employment of Heated Air as a Motive Power," describes an engine driven by heated air, which consists of three cylinders, the two outer being alternately heated and cooled, causing an expansive force to take place in the heated cylinder, and to cause a plunger or piston to move in a smaller centre cylinder. Dr. Werner von Siemens points out the advantages from an economical view in perfecting an engine of this kind. Any kind of gas may be employed; the cost of mechanical power is reduced by the reduction in the consumption of fuel. The author's keen mechanical insight into the conditions of a successful machine is obvious when he discusses the difficulties to be encountered in the construction of such an engine, as in avoiding the loss of heat. The Dundee engine described works up to 26H.P., makes 30 revolutions a minute, and a consumption of 6lb. of fuel, whilst the steam-engine of the same power consumed 36lb. The author describes how heat can be retained and fuel further reduced. Another paper follows on "The Application of the Electric Spark to the Measurement of Velocity." Other interesting papers on "Duplex Telegraphy," "Electrostatic Induction," "On the Law of Motion of Gases in Tubes," "On Pneumatic Despatches," "On the Influence of Light," "On the Electric Resistance of Selenium,"

"Standards of Resistance," "On the Unit of Electrical Resistance," "On Currents of Air," and on many questions of physical research are to be found in this volume, which will form a valuable addition to the library of every scientific student and electrician. The papers, although they date from various periods during the last forty years, show the learned author's anticipation of many important discoveries that have taken place.—*The Transactions of the American Society of Civil Engineers* for May are before us. One of the chief papers is that on the "Main Relief Sewer of Brooklyn," by Willard Beahan, M.Am.C.E., illustrated by maps and diagrams. Mr. Beahan gives a descriptive account of this main relief sewer, which has been successfully completed by the Department of City Works, of which Mr. J. P. Adams is commissioner, and Robert Van Buren, M.Am.C.E. chief engineer. The city is divided into sewer districts, the boundary lines of which are the dividing ridges in the secondary or tertiary drainage. The sewers are of various dates, some of vitrified pipe, of cement pipe, and the main district sewers are of brick and stone. The rapid growth of the city has tended to overcharge these sewers, and hence the relief sewer, which intercepts them. The drainage area is 2,000 acres in extent, and the need of relief of storm water was much felt. A provision for this from an area of 1,300 acres was considered sufficient. The maximum rainfall in Brooklyn is 4in. per hour, and it was assumed that 1in. per hour would reach the relief sewer. The sewer described is circular, chiefly 15ft. in diameter in the larger part, and 10ft. and 12ft. at the upper end. It is of brick. The depth of sewer for a great part of the way exceeds 50ft., and this portion was tunnelled. Headway was difficult to obtain in places, and resort to flat tops composed of I-beams, with flat brick arches between to carry the street surface, was made, sections and details of which are given.

—*On the Older Forms of Terracotta Roofing Tiles*, by EDWARD S. MORSE, Director Peabody Academy of Science, is a paper communicated to the Essex Institute, Salem, which appeared in the *American Architect and Building News*. The author describes, and illustrates by sketches, the forms of terracotta roofing tiles used in China, Corea, India, Persia, Greece, Italy, Spain, Mexico, Belgium and Holland, Java, Germany, Russia, France, Switzerland, Great Britain, &c. Mr. Morse's contribution traces back the present roof covering to a remote past, and the typical Roman tile may be found in all these countries. Dörpfeld, in his "Origin of the Doric Style," says it was the invention of the terracotta roofing tile that first made the construction of a sloping roof possible. The Greeks derived the roofing tile from the East; but we must look to China for the early development of the tiled roof, as it was there fictile art began. Graeber describes tiles on the ruins of the Temple of Hera at Olympia, dating nearly a thousand years B.C. The ancient tile consists of two elements, a wide underpiece (tegula) slightly concave upwards, and a narrow semi-cylindrical piece (imbrex) placed in an inverted position to cover the junction of two adjacent tegulae. The open end of the imbrex has often a circular rosette or disc. In Japan and Korea the same type of tile is seen. The tiles are thick and roughly made, the eaves being decorated with scroll patterns, with circular discs of rosette pattern. It is supposed that this type of tile was derived from sections of bark, which was very early used as a roof covering. It is interesting to find the same type in use in Greece; the broad, curved tegula with narrow imbrex is seen, and, in fact, the normal Asiatic type is found in the Orient, Greece, Italy, China, and India. The two latter countries have treated the roofing tile artistically. Massive ridges formed by the imbrex are seen at Shanghai. Mr. Morse's interesting paper is well worth study.—*Holidays in North Germany and Scandinavia*, edited by PERCY LINDLEY (London: 30, Fleet-street) is a capital tourist's guide to these favourite parts of Germany and Scandinavia, by the author of "Walks in the Ardennes," "Walks in Holland," "Walks in Epping Forest," &c. Notes and brief-descriptions of the route, the cost, and the various cities are given, interspersed with very telling illustrations of Hamburg, Heligoland, Lübeck and its Rathhaus, Stralsund, Rügen, Hanover, Hildesheim, the Harz Mountains, and places in Denmark and Norway. The route has the advantage of freshness to the ordinary traveller, and is out of the old track of holiday seekers.

The large German port of Hamburg and its easy reach of Heligoland make alone an attractive trip, and its cost is less than from London to Edinburgh, to say nothing of the smaller cost of North German hotels. Those of our readers who are contemplating a visit to the coasts of the North Sea and Baltic will find this little book of much value and full of just the information they require, the price of which is only 6d.—Two more issues of the handy paper-covered Continental guides, published by Orell and Fussli, of Zurich, at a franc each, under the title of *Illustrated Europe*, have just reached us. No. 133 is devoted to a description of Davos and the railway from Landquart, which has made this healthy resort in the Rhaetian Alps more accessible to English tourists. The work is written by J. Hauri, Pastor of Davos, and illustrated by 29 views, by J. Weber, a native of the same village, and a map. No. 143 of the series describes the *Kursaal Maloja*, an immense mountain hotel of the hardest Austrian Renaissance type just completed on Lake Maloja in the Upper Engadine; it is well illustrated, and has large scale and key maps.

STONEWARE v. IRON PIPES.

SOME useful data are given in a paper by Mr. George Maxwell Lawford on the "Drainage of Town Houses," concerning the advantages of iron pipes for drains passing under premises. Comparing cost between iron and stoneware, taking excavation as common to both, the stoneware is said to work out to 1s. 8d. per foot run, and is made up as follows: 4in. stoneware pipes, per ft. run, 4½d.; laying and jointing, per ft. run, 2d.; bed of concrete, 1ft. by 1ft. 6in. by 1ft. 6in., equal to 2 cubic feet, per ft. run at 15s. per cubic yard, works out at 1s. 1½d. per ft. run. A 4in. coated iron socket pipe, weighing 18lb. per ft. run, costs 1s. 6d. per ft.; laying, 2d. per ft.; jointing, 7d. per ft. run. (Detailed as follows: one joint takes 13lb. of lead at 2d., say, 2s. 2d., and allowing 2d. for oakum, 2s. 4d.; labour, fuel, and clay, 2s. 6d. per joint—total per joint, 4s. 10d.; and with one joint to every 9 feet, the cost is as nearly as possible 7d. per ft.) Totalling these items, the prime cost amounts to 2s. 3d. per ft. run, or nearly 30 per cent. more than the cost of stoneware. This percentage is sometimes exceeded. There is an objection raised by ordinary layers of drains to use anything but stoneware for pipes that pass under the house. In America iron drains are generally used, and in New York, as Mr. Lawford says, they are made compulsory for house drains. The advantages of using them are many. Settlement of the ground does not break them as it does stoneware; the joints of lead and oakum are more secure, and the length of each pipe adds to the security of iron as a material. We should like to see a more general use of iron in the drains passing underneath the house, as we believe the mode of laying stoneware pipes is often faulty and careless in the extreme.

CHIPS.

At the recent Canterbury Diocesan Conference held at Lambeth Palace, Earl Stanhope presented to the Archbishop a replica of Professor Herkomer's painting of the late Bishop of Dover, to be added to the interesting gallery of episcopal portraits in Lambeth Palace.

The position of city engineer of Toronto, which has been allowed to remain vacant for a year, has finally been filled by the appointment of Mr. E. H. Keating. Mr. Keating was formerly city engineer of Halifax, and occupies at present a similar position at Duluth, Minn. The salary offered was 4,000dol. a year, but Mr. Keating demanded, and was promised, 5,000dol.

On Sunday the parish church of Hartburn, after having undergone restoration, was reopened and the new reredos and pulpit were dedicated by the Bishop of Newcastle.

Sir Arthur W. Blomfield, A.R.A., has been appointed as the architect of the memorial to the late Bishop Claughton proposed to be erected in the parish church of Kidderminster.

Mr. Robert Glassby, the sculptor, who assisted Sir Edgar Boehm for many years, died on Wednesday week at Chelsea. Previous to his illness he was engaged upon a marble bust of the late Grand Duke of Hesse, which the Queen had commissioned him to execute, and which was to have been placed in the Royal Mausoleum at Frogmore.

CONTENTS.

Roofs and Roof Coverings	201
The Bishopsgate Institute Competition	202
The British Association at Edinburgh	202
The Architectural Association Excursion.—I.	204
BUILDING NEWS Designing Club	205
The Castellated and Domestic Architecture of Scotland	206
Theatres.—IV.	208
Sanitary Specialities	209
Books Received	210
Stoneware v. Iron Pipes	210
The BUILDING NEWS Directory	211
Our Illustrations	211
Competitions	211
Architectural and Archaeological Societies	211
Wayside Notes	230
Engineering Notes	230
Stone Arches of Large Span	231
Building Intelligence	231
Correspondence	232
Intercommunication	233
Legal	233
Legal Intelligence	233
Water Supply and Sanitary Matters	234
Our Office Table	235
Trade News	235
Tenders	236

ILLUSTRATIONS.

ARCHITECTURAL ASSOCIATION EXCURSION SKETCHES.—	
DURHAM COLLEGE OF SCIENCE, NEWCASTLE-ON-TYNE.—	
CASTELLATED AND DOMESTIC ARCHITECTURE OF SCOTLAND.	
—DESIGNS FOR A SEASIDE BATH HOUSE.	

Our Illustrations.

THE A.A. EXCURSION TO SOMERSETSHIRE,
(See descriptive article on p. 204.)

THE DURHAM COLLEGE OF SCIENCE, NEWCASTLE-
ON-TYNE.

THIS large institution has not been illustrated before, though for some years its erection has been proceeding. The north front and part of the east side were built and opened by the Princess Louise in 1888. The remainder of the east façade and that on the south side are now being erected. The main front, with the great tower over the principal entrance leading to the quadrangle, has not yet been commenced. The first portion cost £23,000, and the present contracts are for a similar amount, so that the entire cost will be between £60,000 and £70,000. The walls are of red brick, with stone dressings, and the roofs are covered with Ruabon tiles. We gave a lengthy description of the building scheme when it was first determined upon, in our issue for Oct. 8, 1886. The museum and school of art are to be located one on either side of the main entrance. The public lecture theatre is to the rear of the tower. The physical laboratory, the lecture room for physics, class-rooms, and chemical laboratories range on the north side, and along the east wing come the chemical lecture hall, the technical chemistry department, and the boiler-house. The south block contains the mechanical engineering, naval architecture, and literary departments. The design, which is a very imposing rendering of a rich phase of English Jacobean, was the work of the late Mr. Robert J. Johnson, F.S.A., of Newcastle, and may be described as his chief work. It is being continued, and has been carried out since his death, a few months ago, by Mr. A. Crawford Hick, the diocesan surveyor of Durham, who was Mr. Johnson's partner. We hope soon to be enabled to illustrate the work more in detail.

THE CASTELLATED ARCHITECTURE OF SCOTLAND.

A REVIEW of this important work by Messrs. Macgibbon and Ross, illustrated with further sketches, will be found on p. 206 *ante*.

A SEASIDE BATH HOUSE.

THE bath-house designs received in the BUILDING NEWS Designing Club competition are critically dealt with in an article on p. 205.

Herr Theodor Hoeck, an architect of the Prussian Ministry of Public Works, has been attached to the German Legation at Washington.

The Countess Grosvenor on Saturday laid the foundation stone of a new church for Saltney, an industrial suburb of Chester. The church is to cost £3,000, and is to seat 325 persons.

COMPETITIONS.

GORTON, MANCHESTER.—For the proposed free library for Gorton district, the city council of Manchester have adopted the designs submitted by Messrs. J. W. and F. Beaumont. The estimated cost of execution is £3,850.

KINGSTON-ON-THAMES.—In reply to the advertisements issued by the town council for designs for a new swimming-bath and extending the Queen's Promenade, half-a-dozen architects sent in designs. At the last meeting of the town council a committee recommended that a premium of £20 be granted to the author of the design under motto "Kingfisher," and £10 to the author of that entitled "Sunlight." The names of the authors were ascertained in open council, and the first was Mr. E. Carter, of 55, Clarence-street, Kingston, and the second Mr. W. H. Hope, surveyor to the Kingston rural sanitary authority. Mr. Carter was appointed architect on condition that his design can be carried out for the sum of £4,435, the estimated amount. Major Macaulay, C.E., acted as assessor.

SALISBURY.—At the quarterly meeting of the Salisbury city council on Friday, the design of Mr. Edward Webb, architect and surveyor, of Queen-street, Cardiff, was accepted for the erection of the tower near the Infirmary, for the new town clock, given to the borough by Dr. Roberts.

WALSALL.—The town council adopted on Monday the recommendation of a committee that the first premium in the preliminary competition for a town hall should be awarded to Mr. J. R. Withers, of Shrewsbury, and the second premium to Mr. Daniel Arkell, of Birmingham. It was further decided, on the committee's advice, to offer three premiums of 100 guineas, 75 guineas, and 50 guineas respectively, for complete designs, with specifications and estimates, the cost of the building not to exceed £20,000, and the main hall to contain seating accommodation for 1,800 persons, calculated on a basis of 13in. for each person, with gangways 12in. wide. A proposition that a sub-committee should be empowered to lay down the conditions upon which competing designs should be invited led to a long discussion, but was adopted by a majority of two to one, an amendment seeking to restrict the outlay to £15,000 being rejected. With regard to a second-competition, that for the proposed public baths, a committee reported that twenty-five sets of plans had been received, and that the Baths Sub-Committee had been asked to select the three sets which, in their opinion, were entitled to the premiums offered.

The subscriptions to the fund with which a memorial is to be raised to the late Mr. Oliver Heywood, a prominent philanthropist in Manchester, now amount to £2,663. A meeting was held on Monday, at which a division was taken as to whether the statue to be erected should be out of doors or within the Town Hall. By 14 votes to 12, it was decided that the statue should be placed out of doors. It was suggested that a suitable site could be found in St. Ann's-square.

Considerable additions and alterations have just been made to the Northern Counties Railway Hotel at Portrush. Mr. Lanyon, of Belfast, is the architect, and Messrs. McLaughlin and Harvey are the contractors.

The restoration of the church tower at Little Wenlock has just been completed at a cost of £400, and two new bells have been added to the three, which have been quartered by Messrs. Taylor and Co., of Loughborough. A new eight-day clock, which strikes on the tenor bell, having two dials, has been also placed in the church, the total cost of improvements amounting to £600. Mr. Roper, of Wellington, was the contractor, and the reopening services took place last week.

The trustees of Shakespeare's birthplace, obtained possession, on Monday, of Anne Hathaway's cottage, Shottery, Stratford-on-Avon, and this interesting Shakesperian relic will now be preserved and maintained as national property under a legally constituted trust. Fifty years ago the cottage was sold by the father of the present tenant, who claims to be a lineal descendant of the Hathaway family for £345. Three months ago, Shakespeare's trustees gave £3,000 for the property. Between fifty and sixty years ago the end portion of the cottage was divided off, and let as a separate tenement. It is now to be opened up as part of the cottage proper, the partitions are to be removed, and the Elizabethan bedstead is to be put back into its original position—an apartment on the ground floor, known as the sleeping chamber.

ARCHITECTURAL & ARCHAEOLOGICAL SOCIETIES.

NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.—This association held its twenty-ninth half-yearly meeting at Newcastle-upon-Tyne on the 26th ult. The president, Mr. J. C. White, of Liverpool, occupied the chair, and representatives from the local associations at London, Liverpool, Birmingham, Bradford, Shrewsbury, Preston, Newcastle-upon-Tyne, Newcastle and Potteries, Leicester, South Shields, Gateshead, Huddersfield, and Derby were present. The report and accounts for the past half-year were adopted. The report stated that during the past six months the Bath, Ipswich, and Isle of Portland Associations had joined. Reference was also made to the important compromise effected in the London district in June last, at which a new series of working rules were agreed to on both sides, and it was also decided to advance wages, both to skilled workmen and labourers in all trades, 3d. per hour. The report added: "It is hoped that the action taken by the London masters will have the effect of preserving peace and quietness in the trade for some years. It is well to mention that the trades were working four different sets of hours. There were no definite rules as to overtime and country money. All these points are now settled on a permanent basis, and it is felt that the concession of wages is met by the settlement of these different points." The Association confirmed the proceedings of their Council in regard to the form of contract now under negotiation, as amended by the Council, and resubmitted to the Institute of Builders, through whom it is to be presented to the Royal Institute of British Architects. A discussion took place as to the question of worked stone being sent from the quarries to the yards or works, and also other matters connected with the building trade. It was decided to hold the next meeting at Derby.

ROYAL ARCHAEOLOGICAL INSTITUTE.—The annual meeting of this institute was opened at Cambridge on Tuesday, when a welcome was offered by the Mayor and Corporation and the Vice-Chancellor at the Guildhall. It is thirty-eight years since the institute visited Cambridge. Earl Percy, the president, replied. The architectural section was opened by an address from Professor J. Willis Clark, the chairman of the section, and President of the Cambridge Antiquarian Society, and visits were paid to various places of interest. On Wednesday there was an excursion to the Cambridgeshire dykes and to Bury St. Edmund's.

CHIPS.

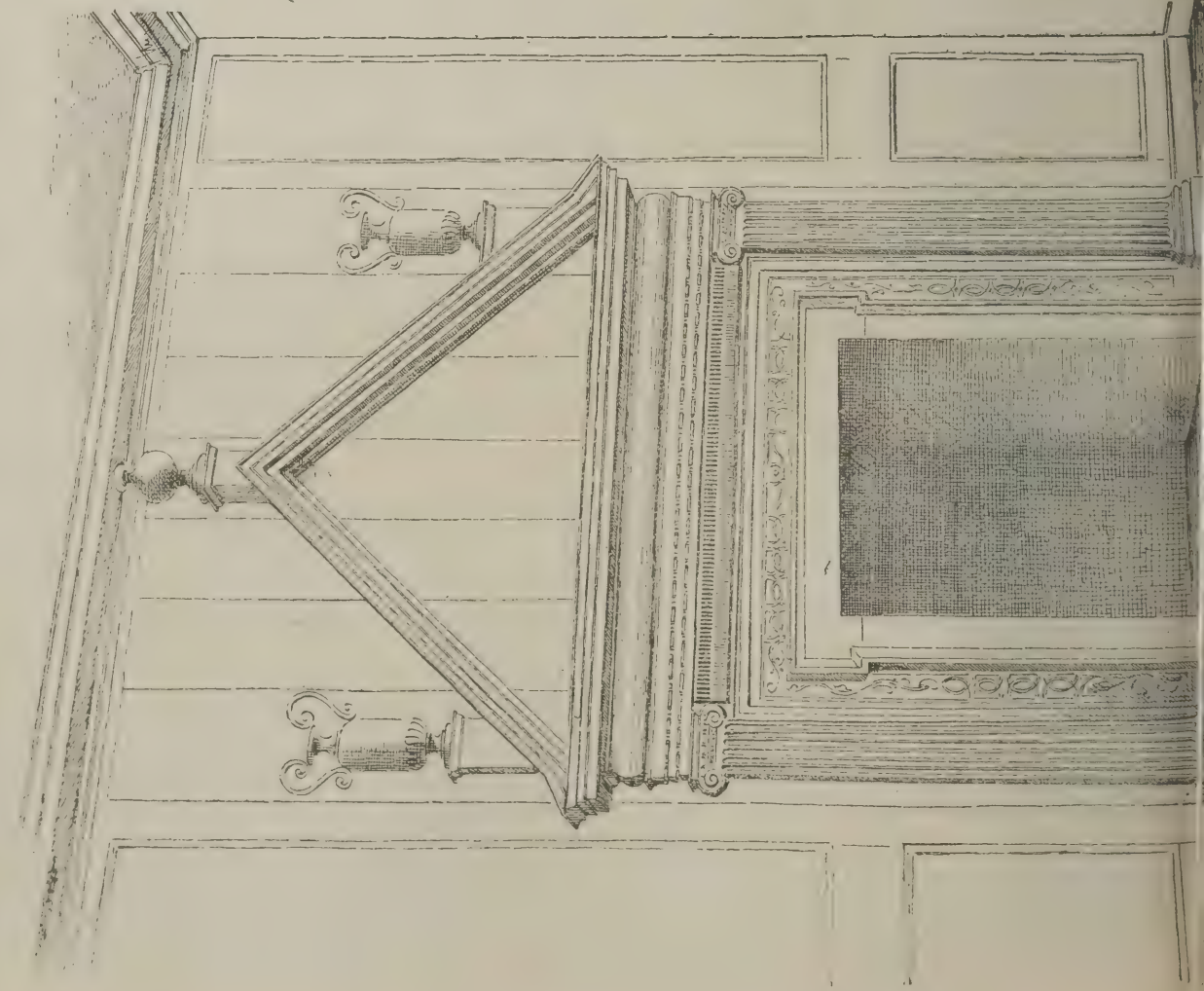
Mr. E. Bernard Tyzack, Shirley, Sharrow, Sheffield, has placed a new clock, with two large ornamental dials and two bells, to the parish church, Sharrow, Sheffield. The clock and bells were supplied and fixed by Messrs. Wm. Potts and Son, of Guildford-street and Cockridge-street, Leeds.

The county council of Cornwall have just issued a bluebook folio of health and other statistics for the county for 1891. It has been compiled by Mr. Silvanus Trevel, M.S.A., of Truro, the chairman of the committee, and gives much useful information as to the progress and welfare of Cornwall.

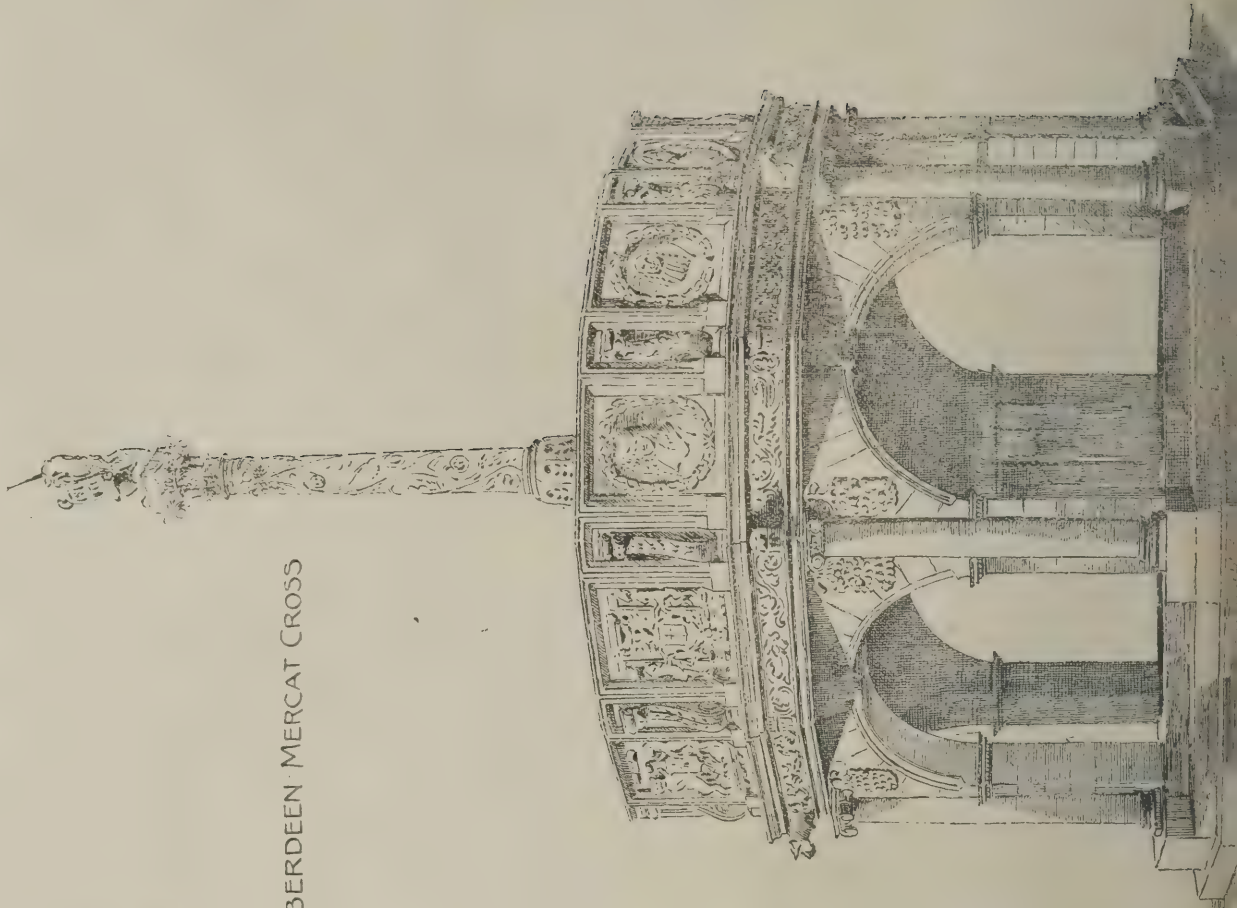
The vicar and churchwardens of Winnington, near Northwich, with a building committee, recently invited competitive designs for a new church of St. Luke, to seat 500 persons, and to cost, say, £5,000, on a site reserved.

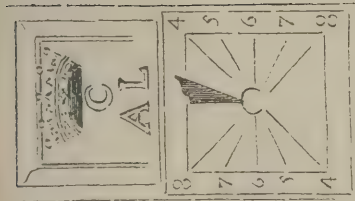
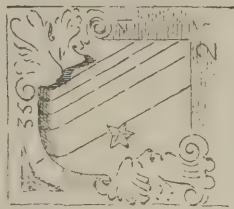
The Glasgow Institute of Fine Arts is about to make a new departure by instituting a series of autumn lectures, which will be given in Glasgow and other parts of Scotland. The lectures will be given for the benefit of the building fund of the Institute.

The parish church of Churt, Surrey, was reconsecrated last week after the rebuilding and enlargement of the chancel at a cost of £500, borne by the Right Hon. George Cubitt. The work has been carried out by Messrs. Tompsett and Kingham, Farnham, from designs by Mr. E. B. P'Anson. The old chancel has been lengthened about 3ft., the east end made square, the roof carried to the height of the rest of the nave, two additional windows opened out, a new chancel arch provided, the altar has been raised two steps, and a piscina inserted in the south wall of the chancel. A new organ-chamber has also been provided. The whole of the new work is in the Transitional style. The additions are faced with Bargate stone, and the coigns and tracery have been carried out in Bath stone.



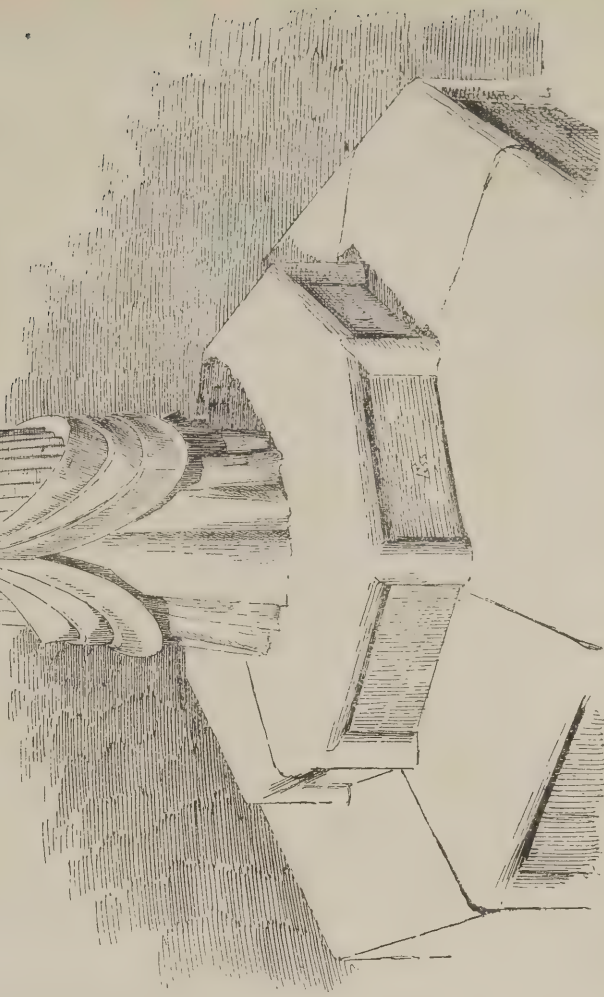
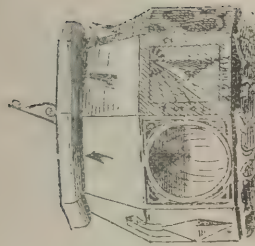
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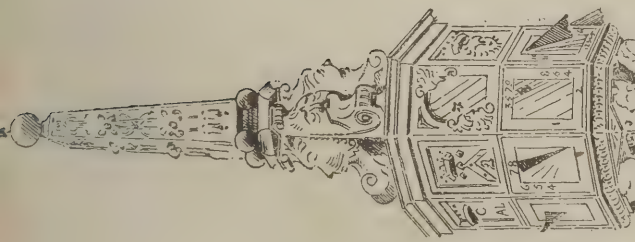


CASTELLATED & DOMESTIC — ARCHITECTURE — OF SCOTLAND.

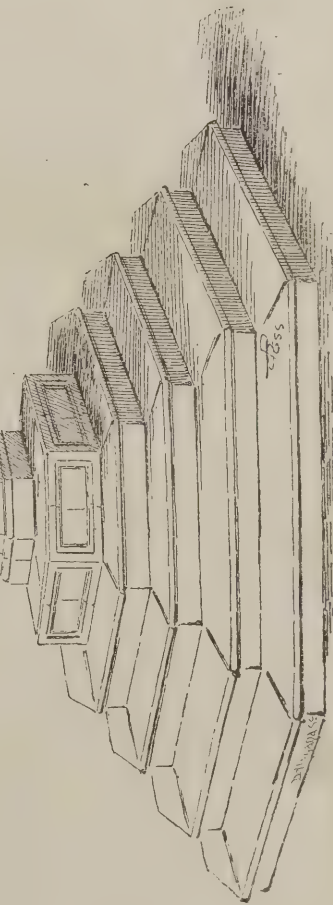
NORTH-BARR - SUNDIAL



BY DAVID MACGIBBON & THOS ROSS ARCH^{TS}



NEWBATTLE ABBEY - SUNDIAL



WAYSIDE NOTES.

THE British Association meeting has afforded no features of very special interest to architects. Compared with former years, the subjects of discussion have been rather lean and threadbare. Old friends, such as "the atmosphere of towns," &c., have reappeared with the methodical precision of the seasons. It seems a pity that the programme is not rendered a little more up to date and apropos of current events. For example, the planet Mars, being in a favourable position for observation, would have been an interesting subject for able papers, and volcanic eruptions being of the present hour, more might have been said about them. Instead of a few great subjects, many puerile and senseless ones came under discussion. "The Prehensile Power of Infants" was the subject of a paper on Monday, and we learned the interesting fact that a newly-born child will support its own weight for a minute on a doctor's finger, while a record of a three-week-old is 2min. 35sec. This shows how we may live and learn. It will strike many as being immensely funny that at the end of this paper, an indignant lady scientist "repudiated the idea that because babies had this prehensile power they must go back to the ape for its origin."

As I have said, the impurity of the atmosphere of cities came up as an evergreen topic. Dr. J. Bailey, of Manchester, read a paper before the Chemical Science Section on Tuesday, and gave some facts with regard to the state, conditions, and causes affecting the air of large towns, the conclusions wherefrom may be well pointed out as striking examples of platitudes. "More smoke, more fog," is the paper in a highly condensed form, and some people knew this before. Sir Douglas Galton, in the discussion, dealt several blows at the open fireplace—a device much abused and ill-treated down in the dust years ago, yet always coming up to time, and holding its own against parsons' grates and other so-called slow-combustion stoves. One would like to ask so eminent an authority as Sir Douglas whether, in view of the "large quantity of decomposing matter from stables and ashpits and street pavements," not to mention the emanations of sewer-gas from street ventilators and other points—the carbon in the air of a large city does not comprise a very effective disinfectant, and whether a little carbon in the nostrils is not preferable to much fever in the blood? We hear a good deal of "London fog." It is generally supposed to be *sui generis*, and head-and-shoulders above other varieties in point of density and blackness; but on the June morning after my arrival at Glasgow—whilst recently in Scotland—there was a thick gloominess about the city that we are not accustomed to in the summer months even in London.

Professor Preece, on Monday, read a paper before the Mechanical Science section, dealing with the destruction of lightning protectors by recent municipal legislation. The point raised is curious and interesting. It appears that it is considered that the marked immunity of private houses in this country from being struck by lightning is due to the fact that the lead on the roofs, and the iron pipes draining the roofs, being connected, form admirable lightning protectors. As householders are now required to remove these pipes from direct connection with the drains, and to leave an air space, the electrical conduction of the pipes is broken, and the pipes ceasing to be a lightning protector, the houses are exposed to the dangers of atmospheric electricity. Poor householder! Another danger! It is satisfactory to know that Professor Preece, while discovering these fearful risks, has found a way out of the difficulty. The remedy that the professor proposes is that while three-fourths of the circular section of the pipe are removed, one-fourth may be retained to maintain electrical connection.

During the recent carpenters' strike much work that would have been done in wood was carried out in iron, and something of the same kind has happened in connection with the ship-building trade. Mr. J. Price, general manager of Messrs. Palmer's shipbuilding yard at Jarrow, gave evidence before Group A of the Labour Commission on Tuesday, when a sitting of the Commission took place at the Westminster Town-hall. Mr. Price

instanced a case where the joiners in their engine-shops refused to allow the carpenters to do certain woodwork which was wanted to finish two large ships. The carpenters would not allow the joiners to do it, and neither side would consent to submit the point to an arbitrator. As a result, the manager had to get the work done in iron instead of wood, in order to get the ships away. We shall hope that the carpenters and joiners saw the folly of their ways. Jealousy between the trades, says Mr. Price, is very marked. Jealousy between plumbers and fitters led to work being passed from one branch to the other and back again, in order that each might do some little portion claimed by them respectively. Such is particularly the case with the fitting of pipes and their flanges, which, it is said, could be done almost completely by either. This action of the workmen is extremely foolish, and in the case of Messrs. Palmer's shipbuilding yard has led to loss of time, increased cost, and the driving of trade into foreign hands. We know what this sort of thing is in the building trade. The necessity of calling in men of another trade to do ten minutes' work has often struck me as ridiculous, particularly on small jobbing works where the farcical nature of the proceedings is very plain. Unfortunately, masters and employers encourage the principle, especially where there is a bill to make out, and plumbers', carpenters', and plasterers' time can all be put down, together with the hods of lime, and bricks, timber, &c., that seem, on paper, to make up a vast deal of work. Doubtless the employers would say that it was the men who were responsible for the system; but a system that answers so well when an account or bill of extras has to be made out, is not likely to receive much discouragement.

Dean Argles' gift to the Peterborough Cathedral—a magnificent marble pavement—has now been completed, and the Italian workmen who have for many months been engaged on the work, have proceeded to Truro Cathedral to carry out a similar scheme. There is thus an added attraction to Peterborough Cathedral, and those going into the neighbourhood should endeavour to see this new work, which is said to be so good.

I notice that the completion of the widening of Ludgate Hill gives a more extensive view of St. Paul's Cathedral. As far down as the railway bridge one can see the whole of the south tower and the major part of the great portico.

The Royal Archaeological Institute this year holds congress at Cambridge. At the commencement of proceedings on Tuesday, when the mayor and corporation welcomed the members in the Guildhall, Earl Percy, president, addressed the meeting and advocated greater unity among the different archaeological societies in the country, recommending that there should be a great central body, with affiliated societies in the provinces. The need or use of such a combination does not occur to one. As means of pleasurable passing winter evenings and going upon picnic excursions in the summer, archaeological societies are very good institutions; but what definite object could be fulfilled by such a banding together as Lord Percy suggests is not very apparent. If, indeed, they could imbue the public with a more general appreciation of the beautiful in architecture, it would be a very good thing; but I do not think that our archaeological societies have done much in this way, although they have had abundant opportunity.

GOTH.

The death is announced from Brussels of M. Joseph Stevens, the well-known animal painter, and elder brother of the still more famous Belgian artist M. Alfred Stevens, who was with him when he died. Joseph Stevens was born in 1819. His paintings were highly esteemed throughout Europe, and gained him many distinctions.

The Mercantile Dry Dock Company, Jarrow, which has been in operation for the last three years, formally opened their second dry dock, at Jarrow, on Thursday in last week. The contract for the making of the dock was let to Mr. J. Best, of Edinburgh, and the engineer of the works is Mr. James Watts Sandeman, of Newcastle. The principal dimensions are:—Clear length on floor, 350ft.; width at top, 72ft.; width on floor level, 49ft.; width of entrance, 50ft.; depth of entrance below cope level, 24ft. 9in.; depth of water on sill, 21ft.

Engineering Notes.

BLACKPOOL.—At the meeting of the directors of the Blackpool Tower Co., held at Manchester on Friday, Messrs. Maxwell and Tuke, the architects, reported that the fourth and last foundation for the tower legs was completed, and everything was now ready for the erection of the steel superstructure. The directors visited the works of Messrs. Heenan and Froude at Newton Heath, and inspected the first of the four legs, which is built and put together in the yard. This leg, which has been sent to Blackpool this week, is 50ft. in height and 18ft. square. The directors also inspected a large amount of steel work lying at the works ready for delivery. It was pointed out that an enormous amount of preliminary work had been done in the working of drawings and in setting out and templating the work; but most of this is now completed, and the delivery will now proceed with considerable speed and regularity. At the subsequent meeting of the directors the estimate of Messrs. Heenan and Froude for the lifts was accepted. These are arranged with two cages, each capable of lifting 50 persons at a time. When working at full speed, the return journey will be performed in less than three minutes, including the time occupied in loading and unloading the passengers. The lifts will be actuated by three sets of accumulators, which will be fed by three hydraulic-pressure pumps, and these in turn will be driven by three independent gas-engines of the "Otto" type, with an aggregate of 240 indicated horse power. The engines, pumps, and accumulators are so arranged that they can be worked either separately or together, and the power provided has a margin of one-third over that required for ordinary use.

GLASGOW.—A new gas-tank at Temple has just been completed for the corporation of Glasgow. The tank is the largest in Scotland, and one of the largest in the kingdom, having a diameter of 240ft. and a depth inside of 46ft. It will contain a three-lift gasometer constructed of steel, and have a capacity of six million cubic feet. The tank, and also a new retort-house at Dawsholm, have been built from plans by Mr. Foulis, gas engineer to the Glasgow Corporation, Mr. Robert M'Alpine being the contractor for both undertakings. The special feature in connection with the tank contract is the extraordinarily short time in which it has been completed. It was begun on October 27 last, and since then 90,000 cubic yards of material have been excavated, a large proportion of it being rock, and there have been worked into the tank 20,000 cubic yards of building materials and puddle, so that, with the re-excavations to form the embankment, upwards of 200,000 tons of materials have been handled. The work has been done in about 200 days, giving an average of 1,000 tons of material handled daily.

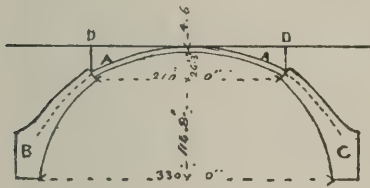
NORTH CORNWALL RAILWAY.—The first part of the second section of the North Cornwall Railway has been opened from Launceston to Tresmeer. The London and South-Western Railway Company opened the first section, from Halwill Junction to Launceston, in 1886. The second section will extend from Launceston to Delabole, 19 miles; but the distance from the former place to Tresmeer is eight miles. Splendid scenery is witnessed on the route, including the valley of the Kenesey, and the Kenesey river, until the village of Egloskerry is reached, a station for which is now in course of construction. The North Cornwall coach will now meet trains at Tresmeer instead of Launceston, the coach route to Newquay and Tintagel being consequently shortened by the alteration. To construct the line some 350,000c.ft. of earthworks have had to be taken up, and there are 25 bridges of various characters constructed. The gradients rise to 1 in 74 between Tresmeer and Egloskerry, and 1 in 132 is the highest on the four miles of rail uniting Egloskerry and Launceston. The line from Tresmeer to Delabole will be continued, and opened about the middle of next summer. The engineers of the line are Messrs. Galbraith and Church, of London. Mr. J. Salter is the resident engineer, and Mr. C. E. Barron represents the contractors, Messrs. Curry, Reeve, and Co.

The death is announced from the island of Sylt, on the west coast of Schleswig, of the landscape painter Emil Schindler.

STONE ARCHES OF LARGE SPAN.

THE largest two stone arches in the world are the one over the Adda at Treyyo, and the other over the Dee, near Chester. Of these, the former is built of granite, and has a span of 251ft. The latter is constructed of sandstone, with a clear opening between abutments of 200ft. Stone arches, if properly designed and erected, are in themselves—that is, so far as the absolute “vault” is concerned—practically indestructible. A comparatively small settlement in their foundations, or in almost any part of the structure, will, however, bring about their premature decay and ultimate destruction. The immovability of their supports is essential to their self-preservation.

In a recent number of *Le Genie Civil* there is a design and description of a stone arch of 330ft. span, which possesses features of both novelty and interest. The author of the design is M. C. Tourtay, Ingenieur des Ponts et Chaussées, who, similarly to some other engineers, considers we have not yet reached the useful limit in the dimensions of arches of masonry. Curiously enough, there exists, as will be pointed out, a community of idea or analogy between the arch under notice and the principle of the continuous or cantilever



girder. It will be seen from the skeleton elevation in the annexed cut that the entire structure consists of three separate pieces—namely, the thin arch A and the two massive curved abutments B and C. The latter, although really independent, do to some extent form a portion of the arch, since the curves of pressure, shown by the dotted lines, are continued down and contained within their thickness. All dimensions on the cut are in feet and decimals, from which, putting S for the span and V for the versed line of the segment, $\frac{S}{V} = 0.125$.

The form of the arch A is that known as “surbased,” of which the generatrix is always greater than the half circumference, and the particular curve of it is the catenary. The author insists strongly upon this curve, as it has long been proved to be the one the best adapted for surbased arches of large span. It is the curve of equal resistance, and as such permits of the line of pressure being drawn in such a manner as to pass nearly through the centre of the joints of the arch-stones, and exert upon each a pressure nearly constant. From the fact that the intrados or soffit is parallel to the extrados the arch is also termed “extradosed.” An existing example of this somewhat peculiar form of arch is to be found in the roof surmounting the lantern at the Pantheon, in Paris.

In order to allow of the proper settlement of the arch when the “centres are struck,” as well as for the expansion due to variations of temperature, “articulations” or hinges are to be provided both at the springings and at the crown. In the braced iron arch, as well as in other types of iron bridges, this proviso is frequently insisted upon by some engineers. Theoretically, no doubt, the precaution is an excellent one, but, as a matter of fact, the “hinges” of an iron arch bridge in France having a span of over 300ft. have been removed, and the arch made continuous at the crown, without the stability of the structure having been the least impaired. It does not necessarily follow that the same course would be advisable with a catenarian stone arch, but, whether or no, the effect is to induce a settlement in the spandrels at DD in the figure, which assumes the form of an open joint, the extent and importance of which will depend upon the magnitude of the structure. It is evident that the curve of the abutments is not a prolongation of that of the surbased arch. The object of this difference is to insure that at no point shall the line of pressure approach either the intrados or the extrados sufficiently closely to risk the opening of any of the joints. In ordinary circular arches the point of rupture is usually located at

an angle of about 30°, and if the curved abutments in the “cut” were traced with a radius approximately equal to that which would prolong the curve of the arch, the point of rupture would be found at nearly the same spot. But by tracing the curve of the abutments with a much larger radius, the line of pressure is maintained well within the proper limits of safety. In the figure, one of the abutments is curved to a radius of 181ft. and the other to one of 198ft., the latter being purposely so drawn, in order to show the effect upon the dotted line of pressure, which is thus thrown more towards the extrados.

In the cantilever and continuous girder bridge the object of the principle is to bring the mass and consequently the weight of the whole structure nearer to the supports, while at the same time diminishing those two items of construction at the centre of the span. Each bridge consists of three parts—confining our attention for the moment to a single span—namely, the two cantilever portions and the central length. If, in a cantilever bridge, the central girder be removed, the two others will remain unaffected by its absence. If, in a continuous bridge, the girder be severed at the points of inflection or of contrary flexure, and the central length removed, the equilibrium of the remaining lengths is undisturbed. This operation was carried out in the case of the Boyne viaduct, which is a continuous girder bridge of three spans, the middle having a length of 260ft. The points of inflection in a continuous girder correspond to the junction of the central and side spans in a cantilever bridge. The two systems are nearly identical both in theory and practice, although there is a marked difference in actual construction.

Regarding the surbased arch and curved abutments, more in a horizontal than in a vertical plane, it is evident that the arch may be considered as analogous to the central girder of the cantilever bridge, and the curved abutments to the cantilever portions over the supports. The object in both is the same—that is, to reduce the dimensions at the centre to a minimum while augmenting them nearer the *points d'appui*. As the curved supports in the figure are to act strictly as abutments, they would stand alone, and consequently the central length—that is, the surbased arch—might be removed without in any degree imperilling the stability of the remaining part of the building.

CHIPS.

Foundation-stones of a Primitive Methodist chapel were laid last week at Mainstone, near Bishop's Castle. The building will be Gothic in style, and Messrs. T. Jones and Sons are the builders.

The Priory Gatehouse at Worksop is about to be inclosed. It has been taken in hand by the Cowley Fathers, and a scheme is on foot for the diversion of the Prior's Well-road which now runs under it in order to inclose the gatehouse in the Priory Church grounds. The Duke of Newcastle has undertaken to defray the cost of the new road, the contract for which has this week been let to Messrs. Cope and Rayner, of Nottingham, at £765.

On Saturday the memorial stone was laid of new flour-mills now being erected at Bonnington, Leith, by the Scottish Co-operative Wholesale Society. The mills, when completed, will be capable of an output of about 4,000 sacks of flour per week, and the warehouse will hold about 40,000 sacks of flour. The machinery is to be provided by Mr. Simon, Manchester.

The annual Ecclesiastical Art Exhibition, which has of late years been an adjunct to the meetings of the Church Congress, will take place this year in part of the building used for the Folkestone Exhibition of 1887. The exhibition will, as usual, embrace every object used in the building and adornment of churches—goldsmiths' and silversmiths' work, ancient and modern and ecclesiastical metal work in general, tapestry, embroidery, wood and ivory carving, church furniture, paintings, drawings, and architectural designs.

Brother M. H. Shaw Stewart, M.P., Provincial Grand Master of Stirlingshire, laid the foundation-stone on Friday in connection with the proposed restoration of the south, east, and west aisles of Falkirk parish church. It is intended to use the new aisles as halls for Sunday-school and other church purposes. The cost of the restoration and of placing an organ in the present building, which it is also proposed to do, is estimated at about £3,000. Mr. Watson, of Messrs. Wardrop and Anderson, Edinburgh, is architect for the work, while Messrs. Forster and Andrews, Hull, are the builders of the organ.

Building Intelligence.

BAYSWATER.—A convent chapel was recently opened at the Convent of the Daughters of Sion, Bayswater. The building is Renaissance in style. The chapel is approached by an entrance-hall, with portress's lodge and waiting-room adjoining. The chapel, which will seat about 250 people, consists of a nave and side-aisles, the principal feature being the altar, with a large reredos, and with niche containing a statue of Our Lady of Sion. The ground floor is devoted entirely to the use of the community, and classrooms occupy the first floor. Over these are three other floors of dormitories, the music-rooms being relegated to the top floor of all. The building has been carried out by Mr. B. E. Nightingale, of Albert Embankment, from the designs of Mr. Arthur Young.

DULWICH, S.E.—Last week the foundation-stone of a new parish church for Dulwich was laid by the Duchess of Teck. The new church, which will be dedicated to St. Barnabas, will, when complete, accommodate 790. The portion proposed to be built at present will hold 500. The style adopted is Perpendicular, of the Norfolk parish-church type, the complete church being designed to consist of nave and aisles, with north and south porches and a large western tower forming a baptistery, a chancel with morning chapel on the south, and vestries on the north, the organ being placed in a gallery over the priests' vestry. The materials used are brick and terracotta, with red stone for tracery and dressings, and slated roofs. The church will be heated with hot water. The architects are Messrs. Oliver and Leeson, of Newcastle-on-Tyne.

HULL.—The Grosvenor Hotel in Carr-lane, facing the Arcade, was opened on Saturday. It is Dutch Renaissance in style, cost £12,000, and consists on the ground floor of a restaurant and serving-room, together with a smoking-court, billiard-room, public lavatories, and stock-rooms for the accommodation of commercial travellers. On the first floor there are the commercial-room, 30ft. by 20ft.; coffee-room, 30ft. by 20ft.; drawing-room, smoking room, several sitting-rooms, and a dining-room, 60ft. by 20ft. There are in connection with the hotel about 70 bedrooms. The kitchens and laundry are arranged on the fifth or top floor. The hotel is fitted up throughout with the electric light. Mechanical-power lifts have been fitted up by Messrs. Waygood, of London, and the boilers and steam arrangements are by Messrs. Barford and Perkins, of Edinburgh. The building is from the designs of Mr. W. Alfred Gelder, F.R.I.B.A., and the contract for the building has been executed by Mr. F. Blackburn. We illustrated the hotel in our issue of July 24th, 1891.

KINGSTOWN, CO. DUBLIN.—A meeting was held at Kingstown on Sunday, under the presidency of the R.C. Archbishop of Dublin, in aid of the fund for raising some £1,100 for the completion of St. Michael's Church, now in progress, from plans by and under the superintendence of Mr. John L. Robinson, R.H.A., of Great Brunswick-street, Dublin. The architect explained that he had prepared plans for the completion of the church on the general design of the portion built in the time of the late Cardinal McCabe, but it has been decided to carry out the work in sections. The present contract includes the removal of the flat roof and plaster groining over the chancel, and the erection of a roof of the same pitch and character as that covering the new nave. Some heavy piers close by the transepts have been removed, and new arches, with polished granite columns supporting them, have been inserted in their place. The nave will now be divided from the transepts by lofty moulded arches supported on coupled granite columns with Portland stone capitals and bases. The chancel will now be divided from the nave by an arch, 37ft. in width, supported by six polished granite columns. The chancel arch will be richly moulded and carved. This section is being carried out in such a manner that any of the other sections may be undertaken either now or hereafter without undoing any of the present work. Mr. James Kiernan, of Talbot-street, Dublin, is the contractor. At the close of the meeting promises amounting to £1,138 were made.

LYNTON.—The parish church of Lynton, North Devon, was recently reopened, after having been

restored and enlarged. The old building seated 420 persons, but in the new one accommodation will be found for 550. The work has been divided into two portions, the first of which, costing about £3,000, is now finished. The plans were prepared by the late Mr. J. D. Sedding, of London. The church may be said to be almost entirely rebuilt, for of the old structure only the tower and south aisle, with a 15th-century oak roof (recently cleansed from plaster) remain. The tower, which dates from the 15th century, has been re-pointed inside and out, and four windows have been added. The work now done also includes the restoration of the south aisle and the complete rebuilding of the nave and north aisle. The walls are built of limestone, the stone dressings and arcades being of Ham-hill stone. The roof is a waggon roof, with oak bosses and deal framing. The body of the church is laid with parquet flooring, and the aisles with Portland stone and slate. The new stained-glass windows have been designed to illustrate the Benedicite, beginning with the west window, and continuing round to the window next to the north porch. The masonry work has been carried out by Messrs. Bryant and Sons, of Barnstable; the carpentry by Mr. Gardiner, of Landkey; and the glazing by Mr. Allen, of Barnstable. It is proposed to light the church with the electric light in September.

ROCHESTER CATHEDRAL.—According to the writer of "Cathedral Notes" in the *Rochester Diocesan Magazine*, the north nave turret was condemned solely on the ground that it was in so bad a condition that its face would have to be entirely renewed, and that such restoration could not be carried out so as to preserve its original character. It was merely rubble work—the odds and ends of the mason's yard, put together without properly constructed groins, its face having been patched up at various times with mortar or cement and bits of flint. It was cracked right through from bottom to top in two of its angles. The mortar was quite rotten; in fact, when it was pulled down—for the turret is now gone—the workmen found it difficult to keep some parts of it from crumbling down under their hands. With regard to completion of the north nave turret and of the two side turrets, the committee first of all asked Mr. J. L. Pearson, R.A., their architect, to submit designs of his own conception in a style other than Norman; but, having had fresh evidence brought before them of the character and dimensions of the Norman turrets which were standing 150 years ago, they have decided to reproduce them.

TIR PHIL, GLAMORGANSHIRE.—On Sunday last the Bishop of Llandaff opened a new mission-room and Sunday-school which has been built at Tir Phil for the Rev. S. Bees, vicar of Pontlollyn. The building will accommodate about 200. It is Domestic Gothic, plain in style, but effective architecturally. The walls are of native stone, with Ebbw Vale red pressed brick and Bath-stone dressings, the roof being covered with green slates. Mr. Owen Lewis, of Cardiff, was the builder, and Messrs. Veall and Sant, of the same town, were the architects.

WEST BATTERSEA.—On Wednesday week the foundation-stone of the new Church of the Sacred Heart was laid by the Bishop of Southwark, Dr. Butt, in Trott-street, Old Battersea. This, the first church built in England by the Silesian Order, is designed in the Romanesque style of the 12th century, and will resemble, on a small scale, the church of St. John the Evangelist, at Turin, built in recent years by the same order. The galilee of the Cathedral of Durham has to a great extent been followed as a model in the design. The whole of the church is externally constructed of red brick, with stone dressings sparingly used. The plan consists of a wide nave, with a span of 32ft. in the clear, with two broad aisles, a chancel terminating in a semicircular apse behind the high altar, and two apsidal chapels projecting from small eastern transepts, which terminate the aisles. At the west end will be a lofty tower and spire. The tower is flanked by western transepts, in one of which is the baptistery. The total internal length of the church is 124ft., and its width, including aisles, 65ft. 6in. The nave is groined in wood, with stone vaulting, shafts, and springers, while the chancel is vaulted in brick. The floors, where not tiled, will be all of solid wood-block paving. The heating will be by warm air. Mr. Frederick Walters, F.S.A., of Great Queen-street, is the architect, and the contractors are Messrs. Longley and Co., of Crawley, Sussex.

TO CORRESPONDENTS.

(We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.)

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The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and SIXPENCE for every eight words after. All Situation Advertisements must be prepaid.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL, XLII, XLVI, XLIX, L, LI, LIH, LIV, LVIII, LIX, LX, LXI, and LXII may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

SASHER. (We know nothing of the patent sash referred to. It cannot be much in vogue, or it would be advertised in our pages. We cannot ask for gratuitous advertisements of appliances, &c., in "Intercommunication." If a maker or vendor does not advertise in our pages, it is a pretty sure sign that there is either no necessity for him to do so, or that there is very little demand for his goods—most often the latter.)

RECEIVED.—W. R. and Co.—Elijah.—B. M. R. (Truro)—Reg. Plumb.—S. C. M. Co.—F. R.—Martindale.

Correspondence.

THEATRES.

To the Editor of the BUILDING NEWS.

SIR,—Mr. Woodrow, in his interesting series of articles, has referred to my work on theatre construction, and to my proposal for a "safety theatre," having up-sloping exits in lieu of staircases. He questions the practicability of my suggestion on the grounds of expense, and proceeds to give the dimensions of my proposed site, which I admit are somewhat extensive. In fairness, it should be stated that my theatre is a model theatre—a self-contained building in all that pertains to the business of a theatre and the multifarious trades connected therewith. Hence the seemingly large area required.

The application of up-sloping exits to an ordinary-sized theatre does not necessitate a prohibitive increase in the area of the site. In fact, the requisite increase of area required is already demanded by the L.C.C. Regulation No. 3—if strictly enforced—which provides that a theatre shall not be erected "within 20ft. of any windows or other openings belonging to any other premises overlooking the site."

The superior safety of the ascending method of egress advocated by me for some years past, is admitted by Mr. Woodrow and all who have studied the subject. The only question at issue is the extent of its application, and in my model theatre I have not hesitated to carry out the

principle to its ultimate extent by placing the gallery entrance at the street level.

The L.C.C. Regulation No. 9, which would, as suggested by Mr. Woodrow, prevent my scheme from being carried out in London, does not appear to have been made in the interests of public safety, but rather as a concession to the "stage cellar," and in the supposed interests of drainage.

Mr. Woodrow admits the possibility of constructing a cellar "so as to insure the exclusion and prevent the percolation of surface water," and it is further within the knowledge of architects that modern science has rendered it possible to secure effective drainage in buildings that are at a considerably lower level than the main sewer. In view of these facts, it is difficult to assign a legitimate reason for the existence of such a restrictive clause as Regulation No. 9.

Mr. Woodrow's elucidation of the L.C.C. Theatre regulations will be particularly interesting and instructive. Some of these regulations are arbitrarily restrictive without being protective. In one instance they are positively contradictory, and in another I venture to think impracticable.

The varying value of theatre regulations as a guide to architects is evidenced by the manner in which the vitally important question of ventilation is dismissed with four lines—a masterly display of no knowledge—whereas, nearly three pages are devoted to the subject of electric-lighting.

It is a matter for regret that all provisions pertaining to the safety of the tens of thousands who nightly visit theatres are the result of purely local effort. An affair of such national importance calls for State intervention. Uniformity of theatre regulations is a consummation much to be desired, and Mr. Woodrow's articles promise to be of considerable value in view of prospective legislation.—I am, &c.,

Aug. 9. JAMES GEO. BUCKLE.

A CLUB FOR JUNIORS.

SIR,—I beg leave to suggest, through your columns, that a club should be formed for the youths and junior members of the architectural profession under 18 years of age. The objects of such club should be that friendly intercourse be established between youths and juniors of the profession, that papers be read and discussions held for the instruction and amusement of the members, that a library be formed and sports got up in connection with the club.

I am of opinion that a club such as this would do an immense amount of good, and would be much appreciated among the juniors. I should be glad to receive letters from all in favour of such a club.—I am, &c., G. COLLAS ROBIN.

357, Liverpool-road, London, N., Aug. 9.

The French Minister of Public Works has accepted a contract for the enlargement of the port of Havre, which will cost forty-four million francs, instead of eighty-eight millions, as at first estimated.

The Birmingham District and Counties Banking Company has recently erected new premises on a corner site at Hockley Hill, to which the business of their existing Hockley branch was transferred on Monday last. The bank is built of red Stourbridge brick with dressings of hard Derbyshire and Hollington stone, while a light-coloured terracotta is used in the cornices and parapets. The style is Italian. The banking-room is 33ft. by 27ft. Mr. C. Whitwell, of Cannon-street, is the architect, and Messrs. James Moffat and Sons are the builders.

The baths committee of the Liverpool Corporation to the Upton Asylum, Chester, have paid a visit there for the purpose of examining and reporting upon the Blackman system of clothes drying as installed in the laundry. After looking over the entire laundry, where they first noticed a Blackman fan 42in. diameter, exhausting steam from the wash-house, the visitors were shown the drying-room. Here a most interesting scene was enacted; the committee were so anxious to see everything for themselves, that they took clothes from the hydro and hung them on the lines, where, to their agreeable surprise, they only hung eight minutes before being thoroughly dry. The clothes were sweet, and totally unlike those dried by any other arrangement indoors. Whilst in the old style of drying in closets there is little or no ventilation, and the clothes are practically stewed or baked. With the Blackman system no closets are necessary, the clothes being hung in an open room, through which fresh air is being continually drawn, and the drying is under perfect control.

Intercommunication.

QUESTIONS.

[1823].—**Wood-Block Flooring.**—I should be glad if any of your correspondents can give me particulars for making a good composition for laying wood blocks in flooring.—H. E. G.

[1824].—**Rhine.**—Will anyone who has visited the banks of the Rhine between Coblenz and Bingen kindly say what are the chief objects of interest in the villages, and if the various churches in Oberwessel have any ancient painted glass, or are otherwise noteworthy? Also if any old houses contain original round glass, and where examples can be seen?—RHINE.

CHIPS.

Owing to the rumours of sickness in Paris, the council of the Society of Architects have deemed it wise to abandon the excursion this year.

On Thursday, the 4th inst., the 100th anniversary of the birth of the Rev. Edward Irving, a statue of the great preacher was unveiled in Annan by the Rev. Professor Charteris, Moderator of the General Assembly of the Established Church of Scotland. The statue is placed on a pedestal of Peterhead granite, and is of white marble. It has been executed by Mr. Dods, sculptor, Dumfries. The cost has been £500.

The picture, "The Queen of Sheba's Visit to King Solomon," by Mr. E. J. Poynter, R.A., has been purchased by the National Gallery of New South Wales. It is on view at Mr. Thomas McLean's gallery, 7, Haymarket, previous to being shipped.

An organ, built by Mr. Joseph Brooke, of Glasgow, at a cost of £335, has recently been placed in the Wesleyan Chapel, Farnley, near Leeds. It was inaugurated on Monday.

The latest addition to the National Gallery collection is a large canvas, painted in 1741 by Benjamin Wilson, with whole-length, life-sized portraits of two of the sons of Frederick, Prince of Wales, and their preceptor, Dr. Ayscough. It has been numbered as No. 1364. The famous altarpiece by Francia, No. 179 in the same collection, which was painted on a panel that has of late years rapidly deteriorated, has been transferred to canvas, and rehung in the gallery.

On Wednesday week, a new Wesleyan Methodist chapel at Tanfield Lee was formally opened. The chapel buildings have been designed by Mr. J. W. Thompson, of Newcastle-on-Tyne, and have cost £1,100. Accommodation will be provided for 360 persons.

The Lancaster Bank, St. Anne's-on-the-Sea, is being warmed and ventilated by means of Shorland's Patent Manchester Grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

As two men, named Woods and Mains, employed by Messrs. Bidder and Co., of Manchester, were repairing the top of a chimney at the copper works of Messrs. Newton, Keates, and Co., Sutton, St. Helen's, on Monday, Woods overbalanced himself, and fell from a height of 200ft. His body was shockingly mangled.

Our note on p. 199 last week, with respect to the Hampshire County Council's new offices, of which Mr. James Robinson, C.E., of Winchester, is the architect, was hardly accurate. Sir Nelson Rycroft, in presenting the report, stated that the plans were prepared by Mr. Robinson, and no alterations were made in them by the consulting architect (Sir Arthur Blomfield) except one of the most trifling description. The consulting architect had reported that he considered the plans showed that the building would be an effective one for the purpose for which it was required, that it was conveniently arranged having regard to the site, and that it would be an ornament to the city.

A new church is being built at East Layton, two miles from Darlington, from plans by Messrs. J. P. and H. D. Pritchett, of Darlington. The style is Early Tudor, and the internal fittings will be of oak, the floors in the chancel and passages being of mosaic. Mr. Dods is the clerk of works.

The parish church of Huish Episcopi is now receiving an addition in the shape of an organ chamber, which is being built on the north side of the chancel by Messrs. Hawkins and Son, builders, of Glastonbury, from designs and under the supervision of Mr. Samsen, architect, of Taunton.

A new branch line of railway is being made from Guiseley to Yeadon and Green-lane, Rawdon, by a local company. The engineer is Mr. J. G. L. Stephenson, of London, the resident engineer being Mr. A. Powell, and the present contractors are Messrs. Whittaker Bros., of Horsforth. The cost will be about £50,000, and the line is eventually to be carried on from Rawdon, through Horsforth, to a junction with the North-Eastern system at Headingley.

Legal.

PUBLIC HEALTH FOR LONDON.

IT was clearly quite time the General Public Health Act came to be applied to London, as it was by the Public Health (London) Act, 1891, which has now been in force since the beginning of the present year. Up to this date the health of London has been so far under the care of the Metropolis Local Management Act, 1855, which, after being in force for 36 years, has just been found to be quite useless upon the great sanitary question of the removal of refuse from household dwellings. This discovery was made in the recent case of "Ellis v. Strand District Board of Works" (*Times*, 27 July) when the Court of Appeal reversed a ruling of Mr. Justice Grantham, holding the defendants liable in damages for neglecting or refusing to empty the plaintiff's dustbin. The Court so decided on the ground that this Act of 1855 only required the defendants to provide proper men to remove refuse, or to contract with some person for getting it done. It was shown that they had so contracted, and the Court held that in doing this they had fulfilled their obligation and complied with the law, leaving the contractor liable to the general public if he failed in carrying out his contract.

This reasoning looks sound from a purely technical standpoint, although it may be remarked that the Court of Appeal could just as easily have held both contractor and Board of Works responsible to the public for the breach of a public duty affecting the public health. However, fortunately the point is no longer of so much importance as it would otherwise have been, because the Public Health for London Act now cures the evil. Under that statute it is plainly provided that it shall be the duty of every sanitary authority to secure the due removal at proper periods of house refuse from premises, and the due cleansing and emptying of ashpits, &c., in their district, under penalty of a substantial fine. There is in this Act no loophole of escape as there was in the old one, by merely employing a contractor, who might, and who often did, fail to do his duty. The obligation is plainly thrown upon the local sanitary authority, and it cannot be shuffled off on to some one else. Besides this, it seems clear that the words "house refuse" in the section quoted cover all kinds of domestic refuse, and include such vegetable and mineral matter as compose the ordinary waste of a household, beyond mere dust and ashes.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by *Tuesday* morning to insure answer same week.

A new bridge built over the river Frome at Longworth, Herefordshire, was inaugurated by Lady Emily Foley last week. It is of stone, and of one span. Mr. Stone was the contractor.

Some improvements in the engineering department of the Grand Hotel, Eastbourne, have been effected. The establishment had been fitted with two hydraulic lifts, worked by water purchased from the water company. There was also in existence a comprehensive steam service for heating, cooking, and laundry drying purposes, from which the whole of the water of condensation was allowed to run to waste. These two matters have been dealt with simultaneously, in the following manner. A steam pumping engine has been put down in combination with a large hydraulic accumulator, giving a pressure of 130lb. per square inch—i.e., equal to the maximum obtainable from the street mains—and from this the lifts are now supplied, the waste water being collected and continuously repumped. The whole of the condensed water from the steam service above referred to, as well as from the exhaust pipes of the laundry and pumping engines, is trapped, collected, and returned to a tank, from which it is pumped hot to the boiler. The net result of the double alteration is that the saving of coal resulting from the use of the hitherto wasted hot water has proved more than sufficient to compensate for the extra steam used by the pumping engine. There is, therefore, a positive reduction of coal consumption, while, on the other hand, all the water for the lifts and half the water for the boilers is obtained absolutely free of cost. The work has been carried out by Messrs. Archibald Smith and Stevens, of Battersea, who at the same time overhauled both the passenger lifts, and to a large extent reconstructed one of them.

LEGAL INTELLIGENCE.

EMPLOYERS' LIABILITY.—At the Brompton County Court, before Deputy-Judge Cooper-Wyld and a jury, W. Cramp, a labourer, sued to recover £100 damages under the Employers' Liability Act against Messrs. Cromwell, builders. The plaintiff, who was employed by the defendants in January last on some new buildings at Kensington-court, High-street, Kensington, was ordered by the defendants' foreman to hoist some rafters, and was supplied with a sling made of rope for that purpose. When half-way up some of the rafters slipped out of the sling, and the plaintiff, to escape the falling timber, jumped off the staging into an area below and broke his ankle. The plaintiff's contention was that there was a defect in the defendants' plant, in that the rope sling should have been made of iron chain, and that rope was not proper material for the purpose. Numerous witnesses were called on either side. The jury gave a verdict for the defendants, and found as a fact that a rope sling was not an improper material for the purpose.

ARBITRATION AT SALFORD.—Mr. Henry Wood, the arbitrator to whom was referred the question of the compensation to be paid to Messrs. Dewhurst and Co. by the Lancashire and Yorkshire Railway Company in respect of property in Salford required by that company for the purpose of widening, has issued his award. The property almost adjoins the Exchange Station, Salford, and consists of two five-story mills, one three-story warehouse, and 3,515 square yards of land, including cottages thereon. The witnesses on behalf of Messrs. Dewhurst and Co., Limited, valued the property at sums varying from £20,763 to £23,184, whilst the witnesses for the railway company valued the same property at from £7,000 to £7,430. The arbitrator has awarded £11,082.

PROPERTY IN BUILDING MATERIALS.—*THE QUEEN v. WALTERS.*—The Court for the Consideration of Crown Cases Reserved, consisting of the Lord Chief Justice, Lord Justice Smith, Mr. Baron Pollock, and Justices Cave and Bruce, had under review on Saturday, a sentence passed by the chairman of the West Kent Quarter Sessions on Albert Walters, a builder, for removing his own plant (poles, ladders, windows, and door-frames) from land which had been taken on a building lease, with power to the freeholder to re-enter, in the event of failure to carry out the covenants. The builder defaulted in some of the conditions, and before the freeholder had re-entered he removed his plant. For this he was convicted; but their Lordships unanimously quashed the conviction, pointing out that it was equivalent to convicting a man of stealing his own property.

A WORCESTER BUILDER CHARGED WITH ARSON.—At the Worcester City police-court on Friday, Ernest William Summer (25), builder, Sansome-place, and William Sampson, labourer, Friar-street, were charged with conspiring to set fire to a workshop in Bowling Green-terrace, the previous morning, with intent to defraud an insurance company. Summer was further charged with inciting Sampson to commit the act. The Chief Constable said that he and Inspector Wallace went at midnight to prisoner's premises and watched. He heard the door leading into the place open, and saw Summer, who was wearing stockings, carrying sand slippers in his hand, go to some timber and glance round. Witness jumped a wall, and, seizing Summer, asked him what he was doing. He said he was watching his yard, and he expected some of his men there at two o'clock. He learned it was Sampson he was waiting for, and as Sampson did not come, he took prisoner into custody. The shop smelt very strongly of paraffin, and a quantity of shavings were saturated. The woodwork in the shop was also saturated with paraffin. The charge against Sampson was withdrawn, in order that he might be called as a witness, and Summer was remanded for a week.

THE PURCHASE OF TRAMWAYS.—Sir Frederick Bramwell, C.E., sat again last week as arbitrator, with Mr. Phipson Beale, Q.C., as assessor, at the Surveyors' Institute, on the question raised between the London County Council and the London Street Tramways Company, as to the terms on which the Council shall take over the tramways of the Company, authorised by the Act of 1870, between Holloway and Euston-road and Camden Town to King's-cross. The Attorney General, for the Tramway Company, persisted in his contention that the arbitrator was bound, in assessing the value, to take into consideration the earnings of the tramway, but expressed his willingness to have a case stated for the decision of the Court, provided it raised the contention of both sides on the point of principle. After some discussion as to the manner in which the case should be framed, the arbitrator repeating that in his view earnings were entirely beside the question, the proceedings were adjourned *sine die*.

ANCIENT LIGHTS.—*NEWEN v. STEER.*—(Chancery Division, Aug. 2, before Mr. Justice Romer.)—This was an action to restrain the obstruction of ancient lights by the erection of an enormous block of

buildings, intended to be used as flats. The plaintiffs are the owners of the lease of, and live at, 42, Hyde Park-gate, Kensington-road. On the east and south sides of this house, which is only about 35ft. high, are a number of ancient lights, which, especially those on the east side, have suffered, as light transmitters, by the defendant's building operations. On the east side of Hyde Park-gate, and opposite the plaintiffs' house, the defendant had run up his pile of flats to the height of 60ft. His original plan to go up altogether about 90ft. was apparently frustrated by the plaintiffs obtaining an interim injunction. The principal question at the trial was whether the injunction should be enlarged into a mandatory injunction to pull down a portion of the obstructing building, or the plaintiffs should be merely recompensed by damages. Mr. Justice Romer held that the plaintiffs were entitled to £200 damages, and the costs of the action, and ordered part of the building to be taken down, the defendant undertaking not to further erect the buildings beyond a certain height.

ARBITRATION AS TO A SEWAGE FARM.—At St. George's Hall, Liverpool, Mr. Lewis Williams has recently presided over an inquiry with a view of ascertaining what compensation was due from the Walton Local Board to Mr. James Sergeant, farmer, Gill Moss, West Derby, in respect of the lease of land held by him of which the freehold has been acquired by the board for the purposes of a sewage farm. The farm, which consists of 73 acres, is held by Mr. Sergeant on a lease of 14 years from the West Derby Waste Land Commissioners, and of that period half is unexpired. The board purchased the freehold for £10,000, and offered to the tenant £2,100 as compensation for disturbance. Mr. Sergeant, however, claimed £7,500, of which £1,518 was set down as the difference between the rent of £73 lls. actually paid to the commissioners and the rack rent value, which was estimated at £300. It was shown, however, that Mr. Sergeant some time back appealed against a poor-law assessment of £300, and succeeded in obtaining a reduction to £224. Mr. Sergeant kept complete books showing that the annual profit for the past seven years was slightly more than £650. The jury, along with the assessor and the parties interested, first viewed the property at Gill Moss, and at the inquiry heard counsel and expert evidence on both sides. The jury awarded the claimant £3,090, to include all growing crops.

CHIPS.

The deaths of two well-known French artists are announced: M. F. Loewe-Marchant, the portrait and historical painter, who studied under Pils and Luminais; and F. S. Briest de Warville, whose landscape and animal studies have been frequently hung at the Salon since 1841. M. Briest de Warville was 74 years of age, and was a pupil of Léon Cogniet.

At Monday's meeting of the Scarborough town council, Dr. G. H. Monk, Underhall-road, Shrewsbury, was appointed medical officer of health for the borough, at a salary of £325 per annum. There were 41 applicants for the appointment.

The Pudsey local board adopted on Monday a sewerage scheme prepared by Mr. Spinks, C.E., and decided to buy for £1,140 ten acres of land at Hough Side for the treatment thereon of the sewage.

In the case of Frederick Rowbotham, late of Swindon and Manchester, now of Pendleton, Salford, late builder and contractor, now out of business, the discharge from bankruptcy has been suspended for two years, ending July 15, 1894, but leave has been given to apply again.

A special meeting of the Dundee Gas Commission was held on Monday for the purpose of appointing an electrical engineer for the electric-lighting works in course of construction. There were 53 applicants for the appointment, and Mr. W. H. Brownlee, of Glasgow, was appointed at a salary of £200 a year.

A new borough is about to be created on Teeside, the district hitherto known as South Stockton, and governed by a local board, having obtained incorporation under the name of Thornaby-on-Tees. It is situated on the Yorkshire bank of the Tees, is virtually a suburb of Stockton, and has a population of 17,000.

On Tuesday week the chairman of the general purposes committee of the Lambeth vestry unveiled the fountain which, mainly through the liberality of Sir Henry Doulton, has been erected in the Vauxhall Park. The fountain is of granite or Doulton ware, and is worth over £300. The cost of it has been defrayed by £70, the balance in the hands of the vestry for the materials of the old Carroun House, and the difference in price has been given by Sir Henry Doulton. A replica of the fountain will be exhibited at the Chicago Exhibition.

WATER SUPPLY AND SANITARY MATTERS.

THE BIRMINGHAM WATER SUPPLY.—After a long discussion last week, the Birmingham City Council approved the report of the Water Committee, reciting the measures which had been taken for obtaining Parliamentary powers for the proposed water supply from Wales, and asking for authority to acquire the necessary land and to carry the scheme into effect. The Water Committee state that the gravest difficulties they had to encounter arose—first, on the questions raised by the County Councils of London, Glamorgan, and Monmouth; and, secondly, on the mode of dealing with the land question. As to the first point, the opponents, who entirely agreed as to the excellence of the source of supply, strongly urged that Birmingham should not be allowed to appropriate it until a general scheme should have been arranged for the division of the remaining watersheds amongst the communities most in need of them, or, at all events, until the Royal Commission now sitting on the subject of the metropolitan water supply should have presented their report. In reply to this contention, the counsel for the corporation were able to point out that this identical question had been raised 25 years ago, and had formed part of the matters submitted to the Commission appointed in 1866; that the Commission had found the matter too vast for them to deal with in reasonable time, and had, therefore, limited their report upon it to the laying down of a few general principles; and, further, that the point had also been raised at the time when the corporation of Liverpool obtained powers for the Vyrnwy scheme. Strong as these arguments were, however, they would not have prevailed if the water committee had not been able to establish an overwhelming case of urgency for an immediate supply for Birmingham. The committee asked the council to authorise them to proceed with all steps necessary for the completion of the purchases already made for acquiring the remaining land and easements which would be necessary for the works, for obtaining all professional assistance that would be required for the engineering and other work, and generally for carrying out the scheme, reporting, of course, to the council from time to time. The resolution was ultimately carried by a unanimous vote, and the council voted an *honorarium* of 1,000 guineas to the town clerk, Mr. Orford Smith, in recognition of his services in connection with the passing of the Bill.

BLACKBURN.—The Blackburn borough engineer on Saturday reported that the expenditure of £170,000 was necessary to provide adequate water supply for the borough in future. He advocated the construction of a new reservoir in Brenand Valley at a cost of £85,000, and an additional storage and improved plant at the existing works, to cost as much more; the old waterworks at Daisy Green and Pickup Bank to be reserved solely for trade purposes.

BUCKHAVEN, N.B.—The Police Commissioners of Buckhaven, Methil, and Innerleven are about to carry out a drainage scheme which will bring the old-fashioned fishing village of Buckhaven into harmony with modern sanitary requirements. The cost of the scheme is estimated at between £3,000 and £4,000. Its main feature, as laid before the commissioners on Monday by their engineer, Mr. Robert Henderson, C.E., Burntisland, is the construction of an intercepting sewer from the east end of Buckhaven to near the railway station, and the sewage of the whole of Buckhaven will then be discharged by an outlet at the east end of the village at low-water mark, as the tide falls. The east outlet is to be of cast iron and 22in. drain-pipes, and another outlet will be 18in. drain cast-iron pipes. The ventilation of the sewers is effected by means of manhole gratings and ventilating tubes, and a large number of the former have been provided for inspection purposes. Means have been taken also for flushing the pipes by mine water from a colliery.

CRIEFF WATER SUPPLY EXTENSION.—A large extension of the water supply from Loch Turret to Crieff has just been completed. When water was first introduced from the loch to the town, in 1872, the pipes were almost wholly 4in. to 5in. tile ones. Since then, however, these have from time to time been lifted and cast-iron ones of a larger diameter substituted, the latest extension of this improvement just completed being the laying down of a 9in. iron pipe through Glenturret, a distance of 3,900 yards, and which has cost about £1,900. Sir P. K. Murray, who is the superior of the loch, and who originally granted the use of the water free for all time, again has allowed the town council to raise the height of the dam-dyke at the outlet of the loch, in order to add to its storage capacity; so that now an additional supply of water to the extent of about 48 million gallons is available for the town. The whole track from the loch to Crieff (a distance of six miles) is now laid with iron pipes 9in. to 10in. in diameter.

GRIMSBY.—A meeting of the Public Works and Drainage Committee was held last week to meet Mr. G. W. Lawes, M.I.C.E., city engineer, of Newcastle-on-Tyne, and Mr. F. W. Lacey, A.M.I.C.E., borough engineer, of Bournemouth, who had reported to the corporation upon the proposed new drainage scheme for the town. The chairman said the subject was divided into three divisions, viz., the drainage, the flushing, and the salt-water supply. There were two difficulties from which they suffered in Grimsby, the one being from the water lying in the drains when the tide was up, causing the drains to be full of water and the land saturated with sewage; and the other arising from the fact that owing to the town being so flat there was a great deposit of sediment in the drains. The report first dealt with the necessity for a pumping station, the second point was that they should have a suitable plant for the purpose of thoroughly flushing the drains by means of salt water. The printed reports were then gone through, and the opinion of the reporting engineers was asked upon points which arose in them, when Mr. Lawes and Mr. Lacey explained the reasons which had weighed with them in arriving at the conclusions set forth in the reports. They recommended a scheme of drainage which, if carried out, should not only relieve the sewers from being tide-locked for many hours but give a surface drainage to the district of between 2ft. and 3ft. throughout, and as a result ought to favour the district from two to three points in the death-rate of the town. The salt-water scheme for drawing water from the Humber for flushing sewers and for street watering, with its water tower, which had been specially reported upon by Mr. Lacey, was then dealt with. A discussion took place upon the relative advantages of fresh and salt water for flushing purposes and for street watering, Mr. Lacey thinking the salt water much more preferable for street watering. It was estimated that the cost of the water provided according to the scheme would be 2d. per 1,000 gallons as against 1s. per 1,000 gallons charged by the waterworks company.

RICHMOND, SURREY.—The Richmond Main Sewerage Board are perplexed as to the means of ventilating their new system of sewers, recently completed at a cost of over £100,000. The destructor system is employed, whereby the sewage gas passes up an iron pillar, usually a gas lamp, and is supposed to be consumed by coal gas at the foot of the pillar. But the draught is frequently sufficient to put out the lighted gas, which thus escapes into the air, and, fearing that explosions may occur, the Richmond Gas Company refuse any longer to supply gas to the destructors. At this very juncture, owing to the complaints as to the offensive smell emitted from the manholes, the Main Sewerage Board are closing all these ventilators, so that the only means of ventilation will be by the sewer gas forcing its way up the drains into the houses.

It is announced that M. Monchicourt, the liquidator, has signed a convention with a financial and technical group for the resumption of the works of the Panama Canal. That group is composed chiefly of former contractors for the Panama Canal works, who are interested in the completion of the canal.

We briefly announced last week the death of the late county surveyor for Hereford, Mr. William Cheiako, of Aylestone-hill, Hereford. Mr. Cheiako, who was born in 1829, commenced his professional studies in 1849 at Guildford, Surrey, and in London; and was engaged in the office of the late Mr. H. Woodyer and Sir G. G. Scott. He was elected county surveyor of Hereford in 1861, and continued to hold the office until the beginning of the present year, when failing health compelled him to resign.

On Tuesday week the formal dedication and handing over of a library and free school which has been built, furnished, and endowed at the sole expense of Mr. Robinson Gill, stone merchant, of New York, took place at Askwith, near Otley, Yorks. The building, which has been erected from designs by Mr. A. Marshall, of Otley, is 43ft. by 31ft. 6in. The front rooms consist of entrance-hall, library, and committee-room. To the back is a lecture-hall, which can be divided by a movable partition into two rooms.

Queen Wilhelmina and her mother, the Queen Regent, visited Amsterdam on Thursday in last week to open the first and most important part of the new Merwede Canal, which affords direct communication for large vessels between Amsterdam and the Rhine. The section thus opened is 28 miles long, and the whole canal when complete will have a length of 43½ miles. The canal, after leaving Amsterdam, crosses the Leyden Rhine, passes Utrecht, and enters the Leek near Vreeswyk, where for the present it ends. The second portion, which is still under construction, commences at Vianen, opposite Vreeswyk, and finally enters the Merwede, one of the branches of the Maas and Waal Delta, from which the new waterway takes its name, a little below Gorinchem. The average breadth is over 100ft., and the depth 10½ft.

Our Office Table.

THE National Association of Master Builders of Great Britain have issued two statements as to the condition of trade—the one in tabular form showing the present state of the labour market, the other a comparative list of the hours worked per week, and the rate of wages per hour, in the various branches of the building trade throughout the United Kingdom. Both reports are brought down to the 1st July, and were prepared by the secretary, Mr. W. Knox, of Liverpool, for presentation at the recent half-yearly meeting of the National Association, held at Newcastle-on-Tyne, and reported on p. 211. The reports as to the state of trade vary, but are, generally speaking, satisfactory, except on the south-east coast, in South Yorkshire, and parts of Lancashire and Cheshire. The hours worked and the rates of wages differ greatly in various districts, and also in individual trades. Masons, for example, range in working time from 47 hours at Altrincham to 61 at Croydon and Lewes, and 61½ at Brighton, and the hourly wages from 5½d. in small towns to 9½d. in London, the provincial average being 8d. For bricklayers and carpenters the hours and wages range in similar manner, the longest being at Brighton and Lewes in each case.

BRIXTON parish church (St. Matthew's) is undergoing the reconstruction of its roof, which we believe was found in a rather decayed condition. New iron principals or trusses are being erected in place of the old timber ones. These are on the lattice or braced system, and are being put together in sections by Messrs. Matth. T. Shaw and Sons, who are the contractors for the ironwork. The work of restoration is proceeding under a temporary tarpaulin roof, which has been placed a working distance over the old roof, and to the same inclination as the old rafters. It may be mentioned that St. Matthew's stands at the junction of Brixton and Tulse Hill-roads, and is one of several Grecian Doric churches erected early in the present century from the designs of Mr. Porden, and consecrated in 1824. The portico is a Doric hexastyle, and at the east end, over the chancel recess, rises the tower with octagonal termination, said to be a copy of the temple of Cyrrhists at Athens.

A GLASGOW architect writes to point out the serious disadvantages under which Scottish architects' pupils labour. Architecture is, he says, the only "business" in which the apprentices work for five years without remuneration, and in some cases have, on the other hand, the privilege of paying a premium. In addition to that, of late years they have been expected to prepare for three successive examinations, involving work enough to occupy all the youths' time, while there are no classes corresponding to those existing in England at which instruction can be gained, and indeed at present there is no body in Scotland capable of organising fresh educational facilities. Heads:—"What Scotland requires is a purely Scotch Institute, a Scotch architectural degree, and classes properly organised in its principal centres. What its apprentices require is (1) time to attend these classes, and the extension of their holidays, so as to enable them to cover the outdoor study required; and (2) salaries from the third year of their apprenticeship, and overtime paid all through."

THE United States House of Representatives has passed without demur a Bill for throwing open the designing of the public buildings to the architects of the country, under certain restrictions, to be imposed by the Secretary of the Treasury. The measure, which was reported unanimously from the Committee on Public Buildings and Grounds, with a strong recommendation in its favour, has yet to be passed by the Senate and approved by the President before it can become a law; but although it is likely that no final action will be taken during the remainder of the present session, another year will probably see it, possibly with some modification, enacted into a statute. The opinions of the Members of Congress, and of the newspapers, seem to be nearly, or quite, unanimous in favour of the new arrangement. The day when architects and architectural designs were looked upon as useless luxuries, unworthy the attention of a "practical" government, which could be better

served by an astute mechanic, appears to have gone by in the United States.

A LARGE scheme of improvements is at present being carried out at the Royal Botanic Gardens and Arboretum, Edinburgh, which will have the effect of increasing their efficiency as teaching institutions, and making them serve as the Kew of the northern capital. Dating from 1670, the Botanic Gardens were removed from Holyrood to Inverleith in 1822; the new gardens have been successively enlarged in 1858, in 1865, and in 1877, and now extend to sixty acres. They are maintained by the Crown as a national institution, and the works in progress at present, at a cost of £8,000, include the welding of the Arboretum and Gardens into unity by the removal of a high wall which still divides the properties, and the making of cross-walks and paths, and in extensive alterations to the palm-houses and greenhouses, so as to bring up to modern requirements. A modern system of heating by hot water is to be introduced into these houses by Messrs. Mackenzie and Moncur, of Edinburgh.

CHIPS.

The parish church of Bourton-on-the-Water is about to be re-seated in pitch-pine and restored. Mr. George Poole, of Bourton-on-the-Hill, is the contractor.

The town council of Bournemouth have adopted plans by Mr. F. E. Robinson for extending the pier and erecting on the seaward end a pavilion. The estimated cost is £22,000.

The town council of Walsall have received 28 tenders for lighting the streets with electricity, these ranging from £6,712 to £22,733. A committee has been instructed to visit half a dozen towns where an electric-lighting installation has been adopted before accepting any tender.

At the meeting on Monday of the Gainsborough local board the chairman announced his intention of presenting to the town the new clock which has been ordered for the new market buildings from Messrs. Potts and Sons, of Leeds, at a cost of £85. He regretted that the structure of the building did not permit of the chimneys being added. The offer was accepted with thanks.

An inquest was held on Friday at Liverpool on the body of John Donnelly, a bricklayer, aged 23, who was killed on the previous day while working at the Atlas Warehouses in Love-lane, in that city, which are being rebuilt after their destruction by fire. He was working on an internal scaffold about 44ft. from the ground, setting an arch over a window. He was seen to stand on the wooden centre-piece of the window, and was warned that it was not meant to bear his weight, but only to carry the centre of the arch. He took no notice of the warning, and it gave way, and he sustained a fracture of the base of the skull. Verdict, "Accidental death."

The death is announced of Mr. Thomas Fletcher Hill, builder, of Woolton, near Liverpool. Deceased, who was 46 years of age, took a prominent part in public affairs in Wootton, being chairman of the gas company, and a member of the local board. He leaves a widow and ten children.

The vestry of St. Pancras has decided to build new municipal buildings on the vacant site at the south-east corner of Great College-street, Camden Town, and the Works Committee has been instructed by the vestry to obtain plans. The existing vestry hall buildings in King's-road, which are inadequate for the purpose to which they are at present devoted, are to be pulled down, and the site utilised for an extension of the workhouse.

In the bankruptcy case of John How, of St. James's-street, Walthamstow, builder, the discharge has been suspended for three years, ending June 23, 1895.

The memorial stone of the western extension and tower of the district church of All Saints, Norwich-road, Ipswich, was laid on Wednesday week. The works now in hand will complete the church, which has been built since 1887, from plans by Mr. S. Wright, of Morecambe, selected in competition. The western extension will raise the accommodation from 500 to 800 sittings, and will cost £3,000. Messrs. Grimwood, of Ipswich and Sudbury, are the contractors.

A full-length subscription portrait of Sir John Harwood was presented to the Mayor and Corporation of Manchester last week to be placed in the State apartments of the building. The portrait has been painted by Mr. H. T. Manns, of Birmingham. A local journal mentions in connection with the presentation that Sir John Harwood came to Manchester in 1853, at the age of 21, and worked for several years in the city as a journeyman painter and plasterer.

Trade News.

WAGES MOVEMENTS.

THE RECENT CARPENTERS' STRIKE.—The balance sheet of the eight hours' committee on the building trade, dealing with the strike in the building trade last year for an eight hours' working day, was issued on Wednesday by the strike committee. The agitation for shorter hours of labour and increased rates of pay culminated on May 2, 1891, in a strike of the men at three of the largest London firms. This was followed by a general lock-out on the part of the masters' association and a strike of the men employed by 90 firms not connected with that association. Of these 50 conceded the men's demands pending the final settlement of the dispute, and the men resumed work on the terms asked for—namely, 47 hours a week and 10d. per hour. Altogether the strike affected 218 firms and 5,000 men. After a struggle lasting over several months, the dispute was, it will be remembered, referred to Mr. J. MacVicar Anderson, F.R.I.B.A., who gave his award on November 19, reducing the hours of labour to 47 in winter and 51½ in summer, without any increase of pay. The balance-sheet showed a total income of £26,959, and an expenditure of £26,771. The income was made up of levies on the trade in London, including trade subscriptions. The provincial levies amounted to £15,813, including Ireland and Scotland £4,768 2s. America and colonial subscription £130, and grant from other trades £3,937. The expenditure consisted of strike pay, £23,571; committee's salaries and other expenses, £1,452; legal expenses, £283; and printing and stationery, £193. This excludes the amount expended by the various carpenters' and joiners' societies, amounting to upwards of £20,000.

AMALGAMATED SOCIETY OF CARPENTERS AND JOINERS.—The report for August states that four new branches of the society have been opened at Acton, Colne, Llanely, and Wanstead. Considerable progress has been made in the welfare of members in the south-western counties. In Falmouth and Penryn the members, co-operating with the other trades, have succeeded in establishing the hour system instead of the day, leaving work at 5.30 p.m. instead of 6 p.m., and also the Saturday half-holiday. In Exeter a half-penny per hour advance has been secured, with shorter hours for the winter months and extra remuneration for overtime. Gainsborough, Huddersfield, Waterford, and Grays each report that increased wages have been obtained.

THE AMALGAMATED UNION OF BUILDERS' LABOURERS.—The third annual convention of the Amalgamated Builders' Union of Great Britain and Ireland was held last week at the Volunteer Inn, St. Peter's-street, Leeds. Mr. John Judge (president of the Leeds branch) in the chair. The following towns were represented:—Leeds, Bradford, Shipley, Hull, Sheffield, Rotherham, Castleford, Nelson, York, Barnsley, Grimsby, Morley, Wakefield, and Doncaster. The delegates represented 16,000 members. It was agreed that Leeds should be the central branch of the union. The following officers were appointed:—Mr. J. Judge, president; Mr. J. Nolan, secretary to the conference; Mr. H. Hart, corresponding secretary for the next twelve months; Mr. P. Lowrey, corresponding secretary pro tem.

ROCHDALE.—The plasterers are on strike in this town for an advance of ½d. per hour—from 8d. to 8½d.—and a revision of the working rules.

The Lords of the Admiralty have again awarded the United Asbestos Company (Limited) the contract for the supply of all asbestos goods required in the Royal Navy during the ensuing twelve months, the principal articles being "Victor" block packing, "Victor" metallic packing, and hard-spun yarn packing for glands; "Victor" metallic sheeting, tape, rings, ovals, &c., for steam and hydraulic joints; asbestos millboard, asbestos tape, covering for steam pipes, &c.

The new church of the Redemptorist Fathers at St. Joseph's, Dundalk, was dedicated by the Most Rev. Dr. Logue, R.C. Archbishop of Armagh, and Primate of all Ireland, on Sunday.

A new Cambridge quarter-clock, showing the time upon three 7ft. copper disks, with all the latest improvements inserted, has just been set going at St. Paul's Church, Alnwick, Northumberland. The work has been carried out by Messrs. W. Potts and Sons, clock manufacturers, Guildford-street and Cookridge-street, Leeds.

Alterations have been made to the Guildhall School of Music, embracing the ventilation, which is now carried out on the Boyle system, the latest improved form of the Self-acting Air-pump Ventilator being adopted for the extraction of the vitiated air, and fresh air admitted by their improved air-inlets.

TENDERS.

city council : —			
Hill and Smith (accepted)	£982	0	0

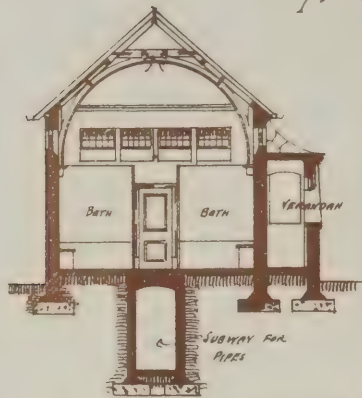
• B.N.D.C. •

PLACED • SECOND •

• A SEASIDE BATH HOUSE •

by "SMILASH-THE-GOTH"

May 1892.



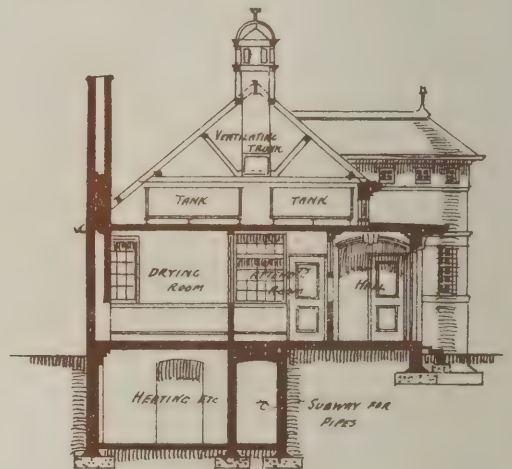
• SECTION BB •



SKETCH



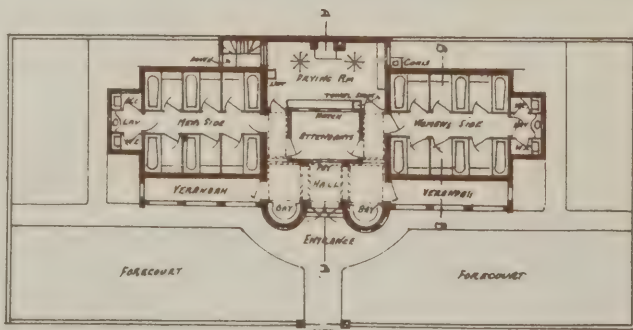
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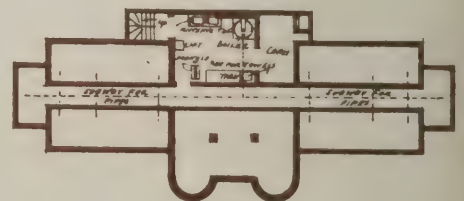
• SECTION AA •



• FRONT ELEVATION •



• GROUND PLAN •



BASEMENT PLAN

SCALE 1 2 3 4 5 6 7 8 9 10 11 12 FEET

• TO ELEVATIONS & SECTIONS •

B.N.D.C.

PLACED FIRST.

Design for
A SMALL BATH HOUSE.

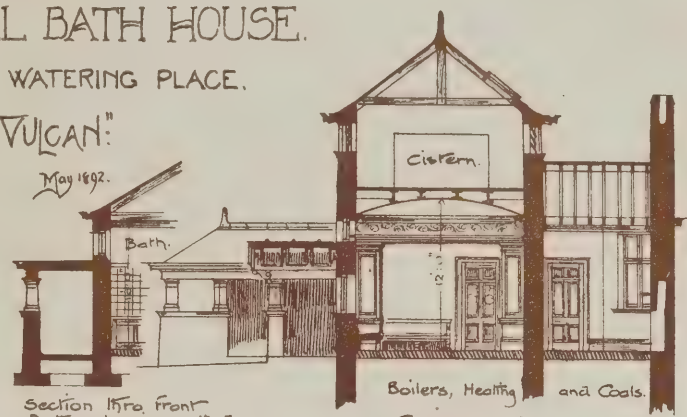
FOR A WATERING PLACE.

BY "VULCAN:"

May 1892.



SIDE ELEVATION.



Boilers, Heating and Coals.
SECTION A.B.

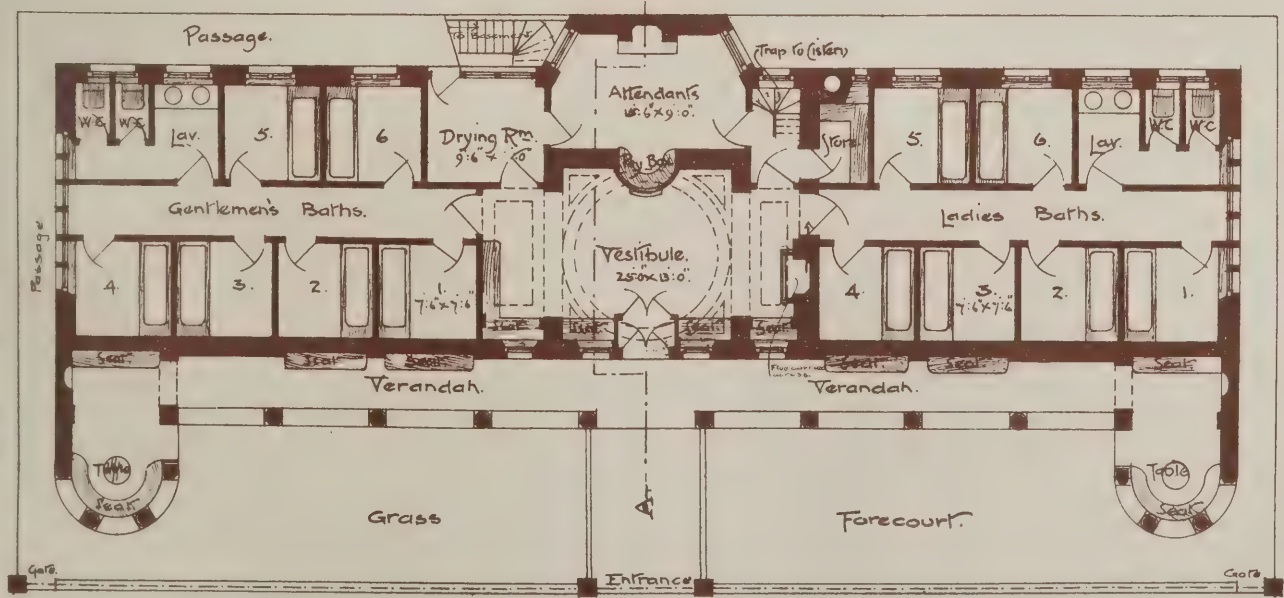
Section thro front
Baths shewing method
of lighting.



Perspective Sketch.

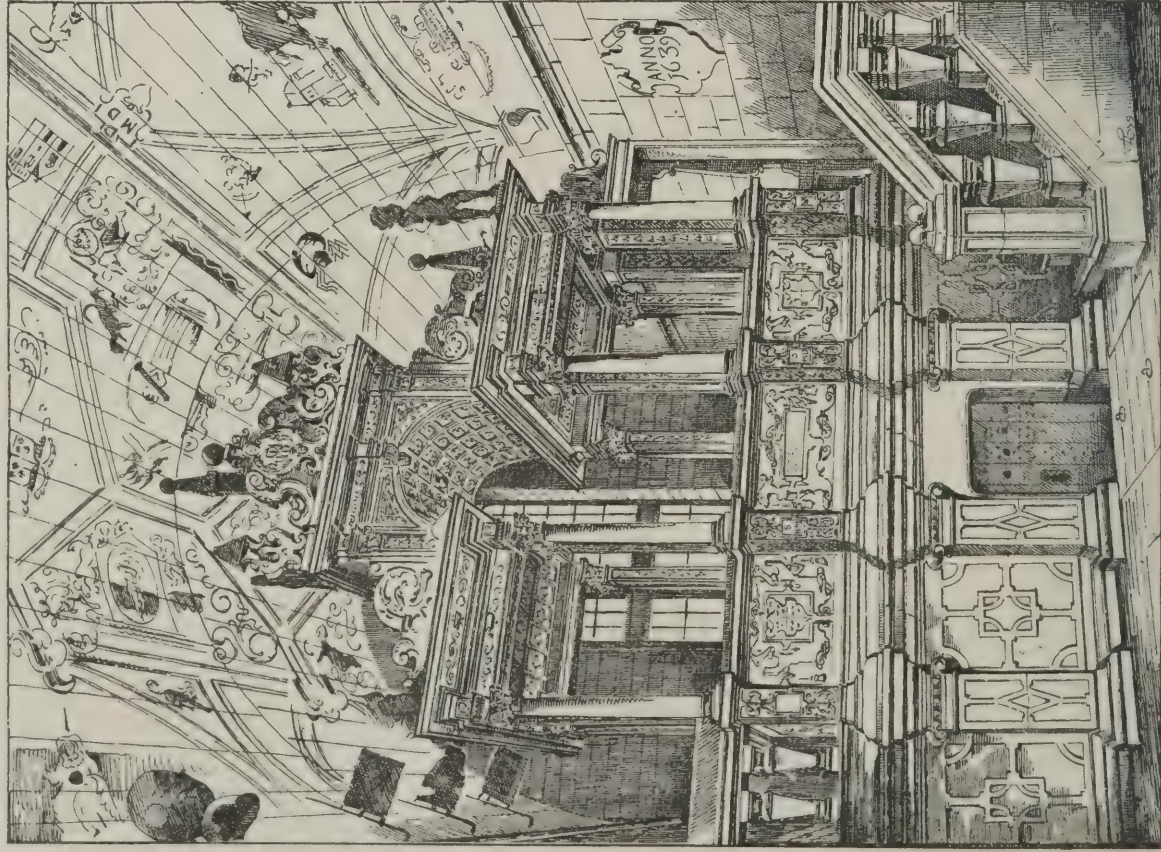


FRONT ELEVATION.

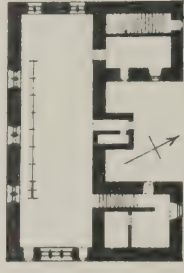


GROUND PLAN.

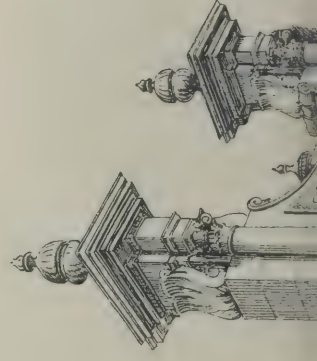
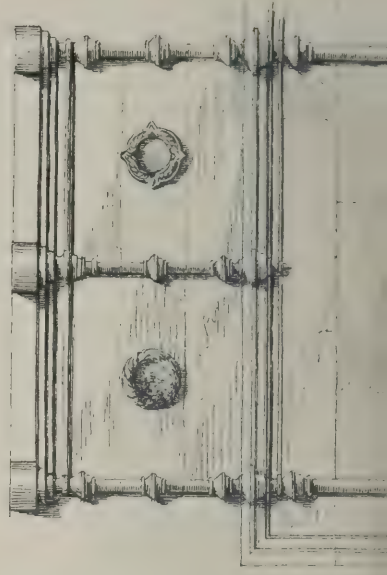
Parade.

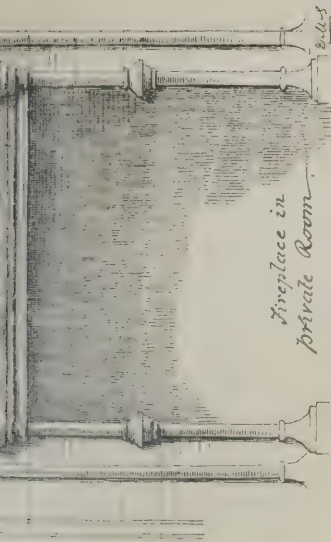
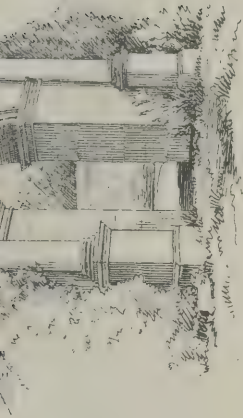


CASTELLATED AND DOMESTIC ARCHITECTURE.

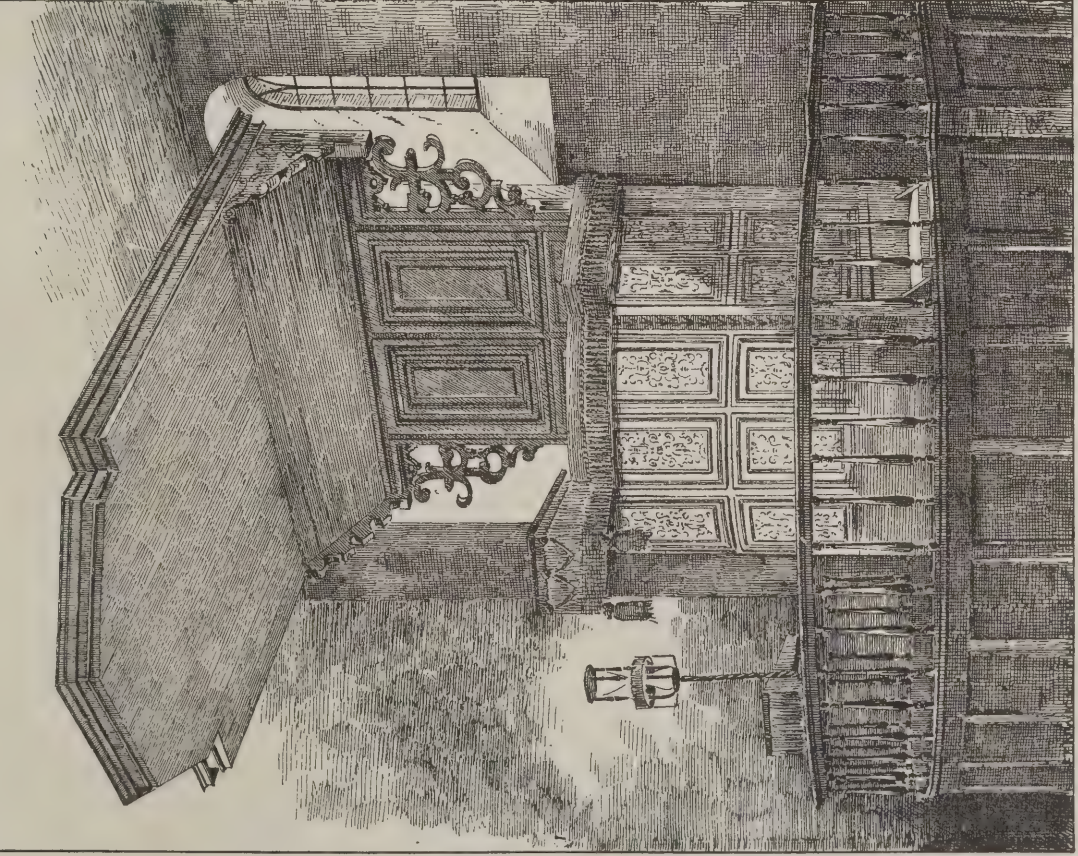


Coman's Hospital, Stirling

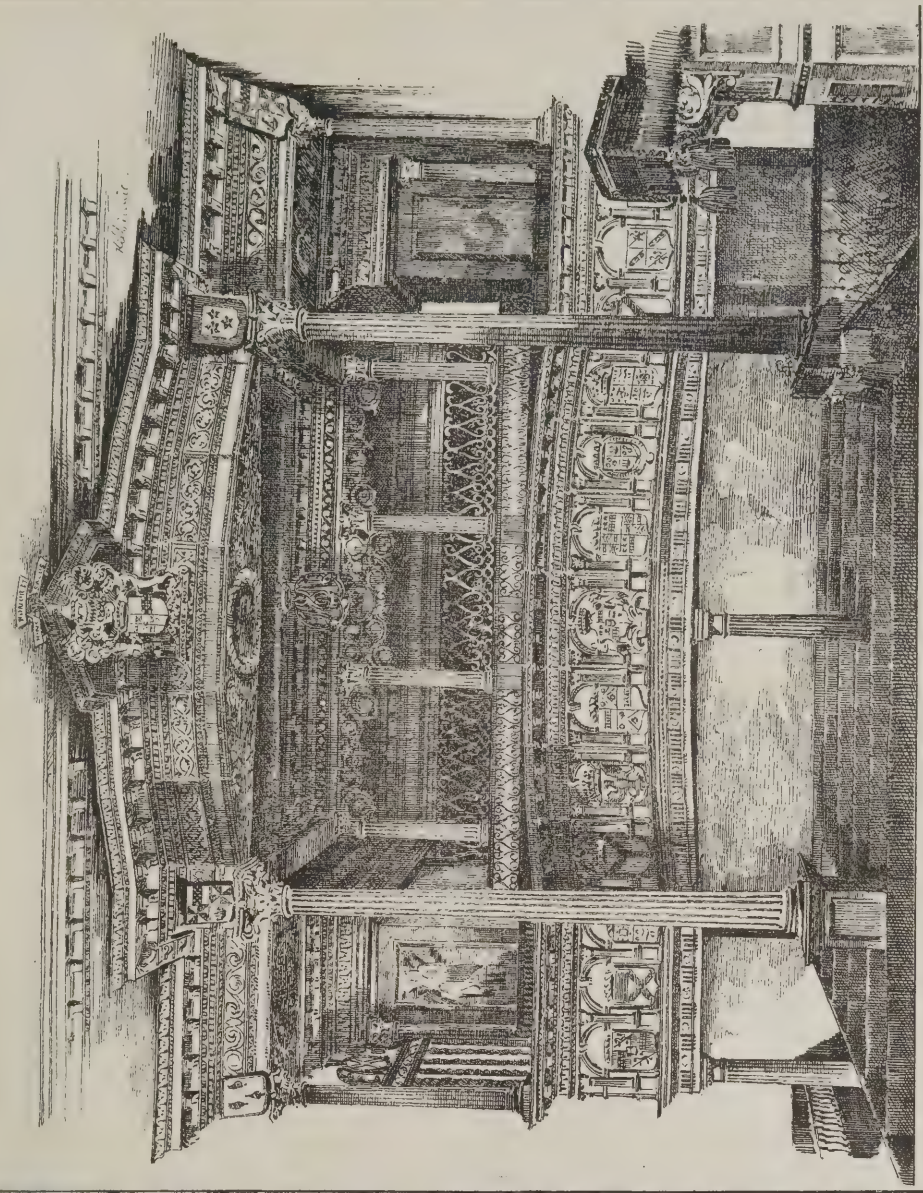




Pollack Castle.



Hearthplace in
Private Room.





DURHAM COLLEGE OF SCIENCE
IN COURSE OF CONSTRUCTION
THE LATE ROBERT J. WILSON

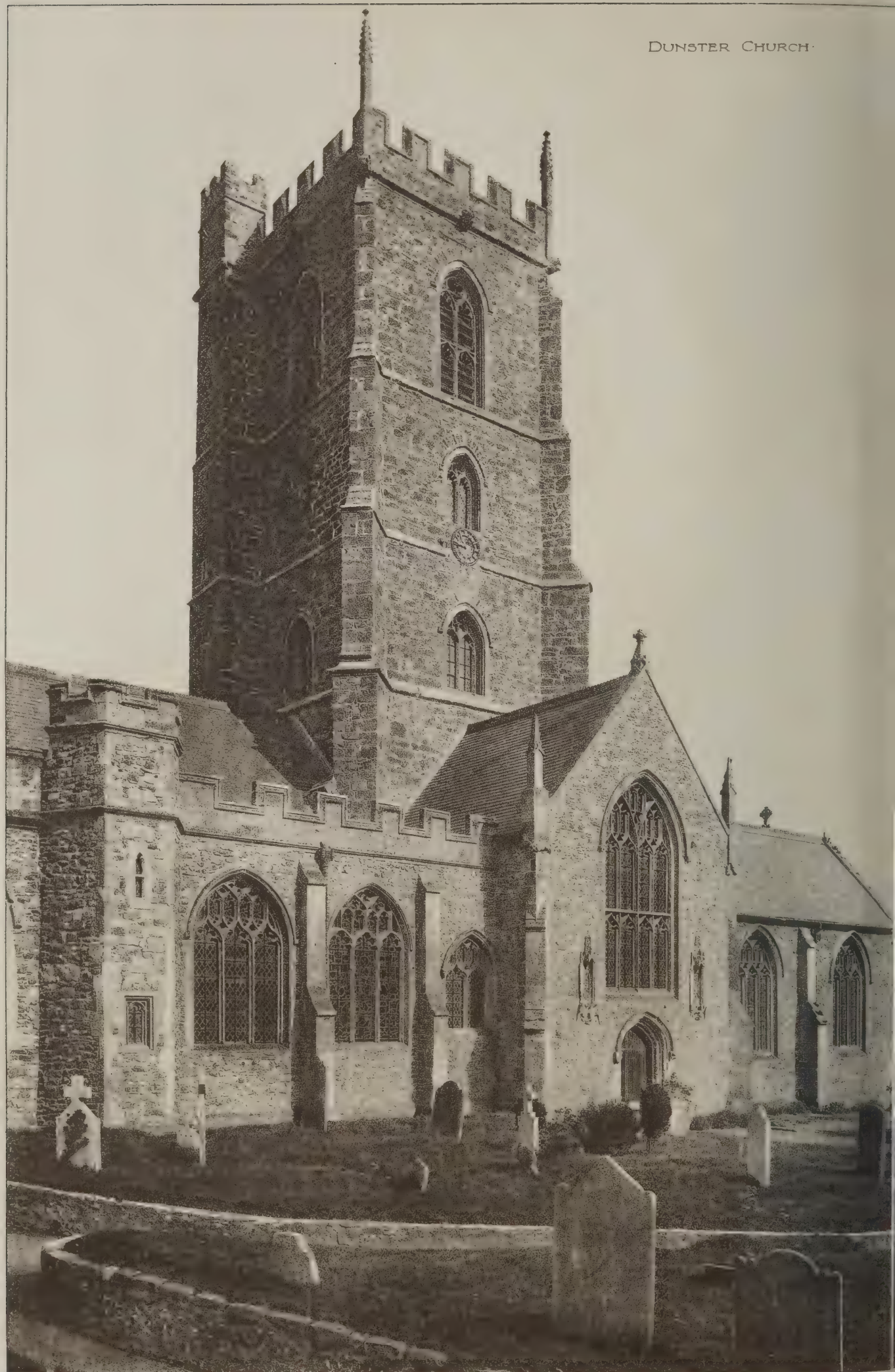
AUG. 12, 1892.



NEWCASTLE UPON TYNE.
RECTION.
ON. F.S.A. ARCHITECT.

"PHOTO-TINT" by James Akerman, 6, Queen Square, London, W.C.

DUNSTER CHURCH.



FROM PHOTOS BY MESSRS F. FRITH & CO

AUG. 12, 1892.



"PHOTO-TINT," by James Akerman & Co. Queen Square, London, W.C.

ION. 1892. NORTH. SOMERSETSHIRE.

THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1963.

FRIDAY, AUGUST 19, 1892.

ARCHITECTURAL TOURISTS.

THE annual holidays have come round, and architects and students are either engaged in making pleasure tours, or are trying to combine the convivialities of social intercourse with just as much sketching and photography as will serve to show something for the time and costs of the journey. In these days of easy transit by railway and steamboat, guide-books and publications, excursions are beginning to fall rather flat—or perhaps we ought to say, the greater facilities have rather reduced the keen relish there once was for exploring architectural antiquities. On the other hand, a larger number of persons avail themselves of the yearly tour, and a greater variety of minds are employed in the work of exploration. How these excursions may be made practically useful as well as entertaining, is a matter for inquiry. After drawings, specifications, or quantities, the mind demands a period of repose once at least in the year. But recreation is not merely relaxation of body and mind, but a fresh storing up of the energy required in everyday work, the re-creation of new stimuli. Who has not felt the expenditure of mental energy due to prolonged labour on one large building? The artistic mind gets exhausted of its store of ideas in preparing detail after detail; the draughtsman constantly wielding his pencil falls into a mannered style of drawing, and the designer is apt to revolve upon himself if he is not taken out of the groove of his own making.

As a means of instruction, the holidays afford ceaseless opportunities, if they are properly directed. It is not the guide-book idea of a holiday tour that is of much value: it may be of use in directing where buildings and other objects are to be seen, and in economising time by instructing in the topography of the locality; but there it ends—it does not supply brains. It is rather going fully prepared to discover the peculiarities of each building or object that is presented to our view, to note distinguishing features, whether of the geological formation of a district, its fauna or flora, or those of the architecture. Even in the forest we may glean something from the soil and the character of the trees—the mode of cottage construction; the seaside resort may afford interest in rocks and beach, and the class of its buildings; an agricultural district, in the planning and construction of its homesteads. As the ornamentist may find some plant or leaf from which he may abstract beauty, so the architectural student will take care to notice and examine any peculiarity of structure or treatment of material that he can adapt to his use—not merely in the style of the architecture, but in the plan, the mode of construction and execution, and the detail. And the art of doing this efficiently is what is most needed in the architect's travel. The sketchbook has its value if, in addition to perspective sketches, it contains sketches of details and measured plans that may lead to useful comparisons being made. But the facile artist is apt to be more intent to fill his pages with examples than to detect beauties of design or methods of workmanship. With the aid of the camera the examination and analysis of old buildings might certainly be more pursued. Notes might be made to supplement the photograph or sketch, and these ought to be directed to such points as plan, the materials used, whether brick, stone, or wood, the

jointing and details of masonry and carpentry.

What infinite diversity of design may be found in study, for example, of towers and spires! From careful observations and slight sketches the architectural student may, for instance, compare the peculiarities of the construction and plan of the towers of Somersetshire and East Anglia. The angle design of the buttresses and pinnacles, and the methods adopted in tapering are alone worth the special attention of the tourist in Somersetshire, and he may attack this peculiarity as found in such examples of towers as those of Wrington, Evercreech, and Huish Episcopi, relying on photographs for general views. Especially to be observed is the way in which the builders of those fine Perpendicular towers managed to set in the angle of the tower, and to poise the upper tier of buttresses on those below. Sometimes they are set diagonally on the lower buttresses, and joined by webs of masonry to the tower, or form engaged pinnacles on the upper stage, as at St. Mary's, Taunton. The corbelled pinnacle, so conspicuous also here and at Huish, and the manner of finishing the angle of tower so as to give a batter, are points of masonry which are worth study, as well as are the numerous kinds of parapet and angle turret. In spire construction, the methods of jointing and springing are little known, and would repay study. Attention hitherto has been chiefly bestowed on general characteristics, such as tracery. Roof construction, as we see it in old churches, has not by any means been exhausted. We have only had general views and drawings, but no reliable information as to the framing or the timberused. Stone vaulting is equally worthy of attention. Access to the parts we have mentioned is not easily obtained; but when a party of students make a visit, it would not be difficult to obtain permission to examine. A ladder would be generally all that was required. But this probably is not the young gentleman's idea of making a holiday: it would mean disarranging his attire or spoiling his hat. However, we repeat that a knowledge of methods and detail is much more valuable than an ordinary unmeasured sketch.

There are many things that can be learned without the ladder or the measuring rod. A knowledge of the materials of the district—notably, the building stone and its state of preservation in the older edifices, is one of great practical importance to the architect. His general geological acquaintance could be greatly extended, and made more practical if in every visit he made he did not neglect to note the local use of any particular limestone or sandstone, its bed, colour, state of preservation, and other qualities. To the lithologists the buildings of a certain locality have a special value apart from its architecture, and if the young architect had a general knowledge of the particular sandstone or limestone of the county he visits, he would have a much wider and more complete knowledge of the architectural development of that district, because he can appreciate and understand why the old masons used certain sections and details in preference to others—why, in fact, the architecture of Yorkshire and Northamptonshire differs from that of Somersetshire; why the style of the ecclesiastical structures of the West of England is richer in detail and sculpturing than that of the North or East. An acquaintance with such a formation as the Great or Bath Oolite, and its upper and lower zones, how its character alters from a freestone into a flagstone, gives the tourist an instructive clue to many peculiarities of local building met with in Oxfordshire, Northamptonshire, and Lincolnshire. The petrological peculiarities of the building stones is also a point of

interest. Distinct bands are noticeable, as in the oolites, of which there are recognised four formations, and as these rocks cross the country from the Dorsetshire to the Yorkshire coast, some of the more important architectural districts are influenced thereby. Observations on the decay of building stones in the older edifices are of special value. These can easily be made, and ought to have reference to those portions of buildings which have most suffered the effect of smoke and other acids, and in what manner the decay proceeds—whether by disintegration or exfoliation. There are other ways in which local information may be of value to the architect, and which he can obtain in no other way than by travel. Reports and published results of the most durable stones are unreliable for many obvious reasons: they cannot be tested personally, the particular beds from which they have been quarried are no longer available. Many stones which have resisted the atmosphere are little known or have escaped notice. Landscape scenery in its relation to architecture, roof coverings, and features of building that give each locality a special character of its own, and many other things which go to make up the local colouring of a place, are matters which escape the ordinary guide-book compilers, but are just those which make travel one of the most potent factors in the education of the architect.

THEATRES.—V.

By ERNEST A. E. WOODROW, A.R.I.B.A.

IT is easily conceived that for the requirements of a theatre, it is not sufficient to overcome the difficulty of obtaining an uninterrupted view of the stage for each spectator; but, it is also necessary for all that is said or sung to be heard with ease in every part of the auditorium, in order that the slightest variation and modulation of the actor's voice may not be lost to the nearest occupant of the stalls or the farthest spectator in the gallery.

The science of acoustics, especially in relation to theatres, seems to be but little understood, and success or failure in the properties of the auditorium is never absolutely assured. M. Charles Garnier, architect of the Grand Opera House of Paris, in concluding a discourse on the science of acoustics in relation to theatres, remarks that the results are but chances. I must, however, differ from the views thus expressed, even by so great an authority, for I believe that there are certain fundamental rules which it is most necessary to observe in order to obtain a building in which it is easy to hear in, speak in, and sing in, more especially such rules as relate to proportion and the employment of suitable materials.

Saunders, writing on the subject of theatres,

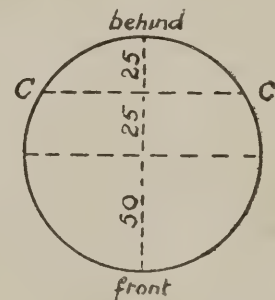


FIG. 1.

relates in full the results of certain experiments made by him with the human voice. Having traced a circle of 100ft. in diameter, he placed the speaker in the centre. The hearer moving on the circumference of this circle heard most distinctly when in front of the speaker, not much less so at the sides, but scarcely at all behind (Fig. 1). The speaker was then placed 25ft. from the centre or three-fourths of the diameter, or 75ft. to the front and 25ft. behind. He was heard best at the sides at CC (Fig. 1), and indifferently in front and behind.

On repeating the experiments, and changing

the situation of the speaker, it was found that the voice reached the circumference most equally when he was placed 17ft. from the centre (Fig. 2). The voice was next traced the extreme distance at which it could be distinctly heard every way, and the line formed was that described in Fig. 2. The situation of the speaker was at A,

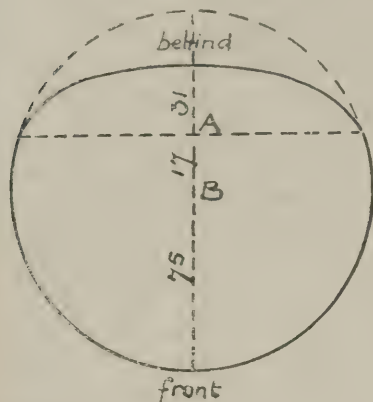


Fig. 2.

from which point B, the centre of the circle, was at the distance of 17ft. in front. The distance from speaker to hearer was 92ft. in front, 75ft. on each side, and 31ft. behind. These experiments were tried on a calm day in the open air, where the sound-waves would die away gradually from friction with the surrounding air. When sound is confined within the limits of a building, experience teaches that the dimensions given above would be too far for the human voice to reach, without considerable effort. The same writer advises that with regard to the size of a theatre, it would not be advisable to have a greater distance than 60ft. from the stage to the farthest spectator on a level with the speaker. Speaking of the height, he asserts that the proportioned height appears to be three-quarters of the diameter. Supposing the diameter to be 60ft., it will follow that the height should be 45ft. from the level of the stage, which height includes all the visual rays within the angle of 45° .

The difference of the sound made by the voice and that made by a fixed sound is evidently occasioned by the voice being pushed forward from the mouth, and the difference is always in proportion to the exertion of the speaker.

With regard to the ascension and descension of the human voice, allowing the difference of the density of the air at the top and bottom, it has been ascertained that it may reasonably be concluded that could the air be found of the same medium throughout, sound would expand equally every way, and form a perfect sphere. In the experiments which I am now quoting, it was found that the proper distance for distinct hearing was nearly the same in a long narrow room or passage as in a large square room. In making this assertion, the writer remarks that it must not be supposed that it is the same in long narrow tubes which have a small bore proportioned to the volley of air issuing from the lungs through the mouth, for it will be equally affected at the end by the displacement of so much air.

The delicate nature of the sound-waves created by the human voice requires a direct and free passage, for a trifling circumstance will check it in its progress; the lightness of the air and gentle impulsion occasioned by the voice will account for its not travelling readily round any obstacle: the time necessary for its arrival gives opportunity for its being destroyed. As any solid obstacle will divert the progress of the sound-wave, so will currents of air affect its direction; therefore in scheming the ventilation of the theatre, it must be remembered that the sound varies in proportion to the density of the air. The direction of the ventilation should be the same as that in which it is desired that the voice should travel. Some doubt has arisen in my mind as to the injurious effect upon the acoustic qualities of the theatre that must be brought about, by the employment of large exhaust ventilators over the stage roof, for if they are made to act as a strong up-draught through the stage, the current of air must tend to divert the direction, and greatly weaken, the sound-

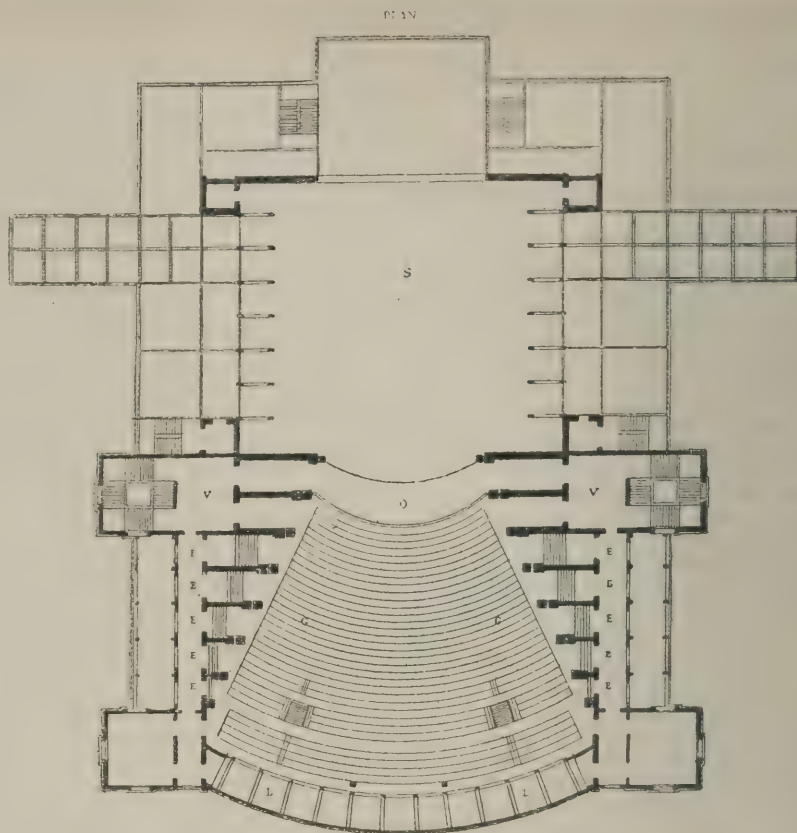


Fig. 3.

S, stage; O, orchestra; V, vestibule; G, seats; L, boxes; E, entrances.

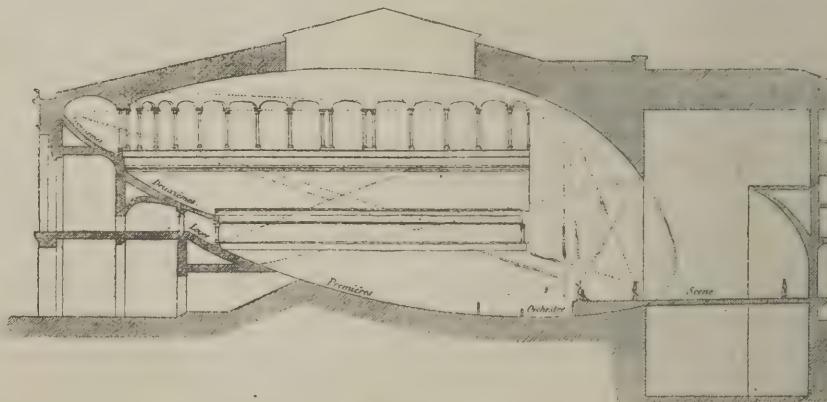


Fig. 4.

waves issuing from the mouth of the actor facing the audience. The ventilation of the auditorium by the sun burner in the ceiling or "dome" has always assisted the sound to travel upwards towards the gallery. As sound does not travel against the current, a ventilation from the auditorium through the stage must be fatal to sound.

Sound, as is well-known, travels in waves in all directions, like the wave created by dropping a stone in water, and when these waves are created in the open air they die away naturally as they become worn out by the friction with the atmosphere; but when they are confined within a limited space by walls, floors, and ceilings, they are reflected in various degrees in accordance with the substance of which such walls, &c., are made.

Materials, therefore, quite as much as form, play an important part in the perfection of the acoustic properties of the auditorium—a part equal in magnitude to the size, shape, and siting of a house. In a theatre the materials demanded by the absolute necessity for creating a fireproof building, contend with the materials which have generally been accepted as desirable for the acoustic qualities of such a building. The architect may experience some difficulty in providing a fireproof building which will possess qualities of acoustic excellence.

It has rightly been observed that we must at all times distinguish between the house designed for the performance of music only and that for the representation of the dramatic art. In the former case a certain amount of resonance is necessary, while in the latter it is all important that the words of the actor should be clear and distinct. The experience gathered from the recently-built so-called fireproof theatres teaches us that if the materials used are not so porous, as to absorb the sound to a large extent, certain forms of fireproof construction are acceptable in houses erected for the drama. Concrete formed of breeze or ground ballast appears to have a certain amount of elasticity, and does not possess the reflecting qualities of denser materials—an echo is not, therefore, produced. Concrete and plaster possess a power of absorption of sound, and fulfil conditions deemed necessary by a French writer on this subject—M. Lachéz—who claims that sound should be killed on the ceilings, box fronts, and walls, and for this reason he considers solid construction more desirable than wooden construction by which the sound would be reinforced. In fireproof buildings there is little difficulty in securing a homogeneous character, and obtaining that amount of vibration, elasticity, resonance, and sympathy between the materials and the sound-waves which are requisite for a

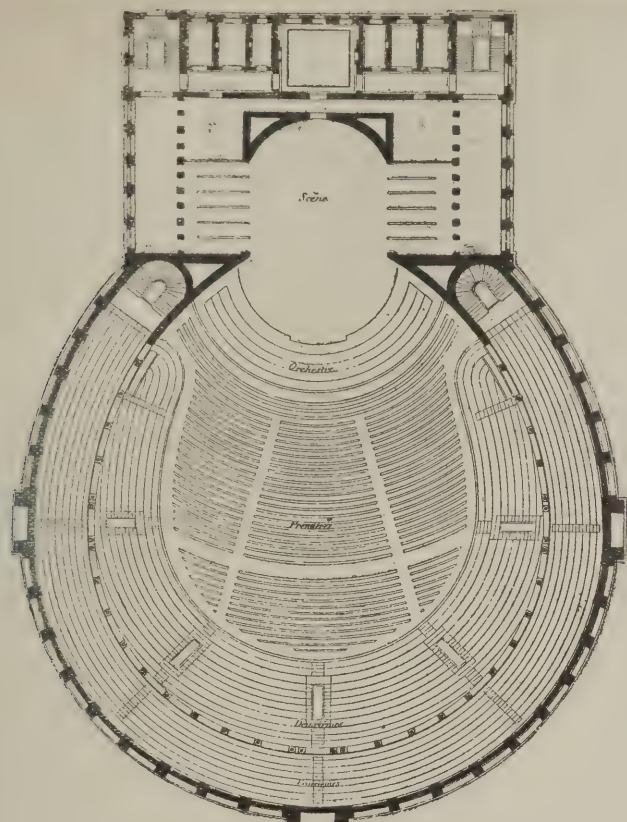


FIG. 5.

theatre of the limited size required by managers of modern times.

One cannot pass away from the consideration of materials in relation to sound without referring to opinions which have been expressed from time to time, as to the desirability of using wood for improving sound in theatres. One writer, who certainly had not the opportunity of gaining the experience we have obtained of late years from the modern theatres, says that wood being of all materials the most favourable to sound, should be adopted in a theatre in preference to every other, not only in the divisions, but the walls, and even the ceiling should be lined with it, care being taken to leave sufficient room behind not to hurt the elastic property of the boards; they should be united in a most artful manner, and the bearers placed at the greatest possible distance. Wood, it has been stated, is the proper material to choose in order to augment the energy of sound in a room adapted for music. M. Lachéz, however, has expressed a very different opinion, and I believe his theory as regards theatres constructed of fireproof materials has proved to be the right one.

Woollen materials are prejudicial to sound, as they absorb it to a great extent, as all materials do which will absorb water. For this reason, a number of persons seated in any part of a theatre prevent the voice reaching those behind, and hence it is we hear better in the front row of the galleries than in other situations which may be nearer the stage, but behind other persons. If the seats of the modern theatre rose clear above each other, as in the ancient theatres, or as in Mr. Wagner's theatre in Bayreuth, this difficulty would be overcome.

In buildings devoted exclusively to music and opera, it is most desirable not to allow the circles to advance too far into the auditorium, to prevent the sound-waves being broken up against the projecting box-fronts. The abolition of columns, which the recent improvement in the construction of theatres has permitted, has done much to improve the acoustic qualities of the theatre. Columns acted as obstructions to the sound-waves, breaking them up, and scattering them in different directions. High partitions dividing the various sections of the audience are bad, as they form a hindrance to the free passage of sound. To inclose the orchestra within, as it were, a ditch, partly buried under the stage, is a self-evident error. The orchestra should only be divided from the audience by an open railing or posts with cord. In America, in Madison-square

Theatre, I believe, the orchestra was placed over the proscenium arch; this proved a failure, for the sound was heard but indistinctly by those below it.

Richard Wagner, the great composer, has designed his own theatre at Bayreuth, a diagram of which I extract from M. Gosset's treatise on the Construction of Theatres. (Fig. 3.) In this house the auditorium is narrowed towards the stage, columns are avoided, and there are no overhanging balconies, the "parterre" sloping rapidly towards the boxes in the rear. There are no stage boxes in this theatre, and there is no doubt that they are always prejudicial to sound.

In the accompanying diagram, which appears in M. Gosset's work on Theatres, was prepared by MM. Davioud and Bourdais in 1875 as a project for a popular opera-house for 9,000 people, with a view to explain their principles of acoustics, it will be observed that there is a large cove over the proscenium, and the stage advances a considerable distance into the auditorium to allow the singers to sing among the audience. The orchestra is spread over a large area. The cove and curved wall at the back of the stage do not appear to me to be of much use, as the scenery and flats which must be placed before them, would naturally destroy all possibility of sound being reflected or enforced by these surfaces.

As shown in MM. Davioud and Bourdais's scheme, the ceiling forms an important function in perfecting the sound qualities of the house. Frequently an auditorium is made too high, and still more frequently the gallery is carried far above the auditorium ceiling. A ceiling sloping upward from the proscenium arch towards the gallery was adopted by Mr. D'Oyly Carte in the New English Opera House, and there is no doubt this form of ceiling is admirable, as it does not hinder the sound-waves travelling upwards to the gallery.

Closely associated with the question of sound is the equally important question of sighting to be dealt with in the next chapter; but before leaving this point, I must remark that of the two forms which I have borrowed for illustrations, that of MM. Davioud and Bourdais show a serious defect, as several of the audience would obtain from the sides little or no view of the stage. These two illustrations show the two extreme examples of the form of auditorium adaptable to modern requirement; but as is well known, horseshoe and prolonged circles of various forms and curves are

more common nowadays, and prove excellent from an acoustic point of view.

Whatever shape the architect may adopt, one thing is certain: he must clothe his theatre in a form agreeable to the eye as well as to the ear; it is also certain that the hard, smooth surfaces of a fireproof building do not prevent the architect from providing a house that is good to hear in. No doubt the upholsterer materially assists with his box hanging and stuffed chairs to prevent the sound being too harsh, and the audience themselves play an important part in the perfection of the acoustic qualities of a fireproof building.

THE ARCHITECTURAL ASSOCIATION EXCURSION.—II.

[WITH ILLUSTRATIONS.]

THE weather was all that could be desired at the start of these proceedings on Monday, when the excursionists began the programme with Bishop's Hull, which is quite close to Taunton. The manor-house is an E-shaped building hard by the roadside, plain enough in general style, which is of a Jacobean kind, with mullioned windows and a good entrance porch, flanked by fluted columns. Upstairs there is a panelled room having a shield-carved frieze round the apartment, which really is suggestive. The church close by has an octagonal tower after the type of Somerton in the same county, and of smaller dimensions. The hideous nave in Churchwarden Gothic was erected in 1824, an early instance of compliance with the requirements of the Incorporated Church Building Society for the contrivance of so many sittings *pro rata* of grant.

Trull parish Church has a square tower, and externally the architect will not find much of interest; but within the sacred edifice the nearly perfect and highly elaborated rood screen, with the florid pulpit and famous oak seating throughout the naves and aisles, will well repay a visit. The style of this work is very late, a mixture of Gothic and Jacobean ornament curiously devised and boldly cut. Some linen panelling at the west end is dated 1560. The pulpit has very boldly carved statues of four Doctors of the Church under ogee canopies, which blend into angel figures above. In the chancel there is some old glass *in situ*, that in the east window representing the Crucifix and SS. Mary and John.

Poundisford Park, once the seat of the Bourdillon family, is a rambling, low-proportioned, and many gabled Tudor-like house with plastered walls externally, and inside some refined and delicately-detailed ceilings contemporary with the building with others of later character. The mullioned windows are very similar in design throughout, and the Georgian addition, comprising a dining-room set at right angles to the entrance front, destroys the symmetry of the composition, which illustrates a somewhat uncommon arrangement. On the extremities of the façade are two big gables, and slightly recessed from these are two smaller ones, that on the left surmounting the porch towards the garden, and the other a bay. In between these is another gable, treated dormer-ways over the main wall, in which is the great window of the hall. The richly-treated lead water cistern, with the water spoutings and stack-pipe heads of elaborate design, is indicated in the small sketch printed with these notes. This is on the entrance side, and formed by the short projecting wings is a small sort of quad. The lead cistern, dated 1671, is enriched with frieze of figures indicative of the chase, wood-cutting, &c., and in the panels are centres of flowers in vases, mermaids, and the like. The hall, which is nearly square, has a sort of fan-vaulted or rather pendent-drop ceiling, with panels relieved by foliated centre-pieces. Over the Jacobean screen is an oriel window projecting into the hall, and between the screen doors is a lantern cupboard glazed on both sides, breaking forwards on both faces, and enriched with baluster uprights, making a little quaint feature. The Carolinian ceiling in the drawing-room is flat and heavy in treatment, with a dove bearing the olive branch as a middle piece of the composition. There is a picturesque brick-built Georgian garden house in the grounds, in harmony with the surroundings. Next week we shall give a general view of the house.

Ruishton Church has a handsome and sturdy

tower, denuded of its parapet or battlements, so that the eye is the more readily concentrated upon the exceptionally rich belfry stages. The lower of these has a central window over a deep string of quatrefoils, and it is filled with pierced stone tracery of corresponding design. On either side of the central window on each face are niches with pinnacled canopies and carved corbels; but the statues there have been removed. The upper stage has two windows of exactly the same design on each front, repeating the detail of the windows below. These are of the Perpendicular period, and are divided by angle-set wall piers, terminating above the springing of the hood moulds as spirelets. The buttresses to the four corners of the tower finish at the string level at the base of these windows, and grow from that point upwards into boldly designed disengaged diagonally placed piers which have gabled faces and crocketed pinnacles finishing below the cornice of the tower itself. The same idea less happily worked out is seen in the great belfry of St. Mary's, Taunton, and in the beautiful tower of Bishop Lydeard Church, which also resembles Ruishton in the arrangement of the belfry windows, which are likewise filled with pierced quatrefoils.

An exceedingly common feature in these parts, as at Kingdon St. Mary, and St. James's, Taunton, as well as at Staple Fitzpaine St. Peter, an extremely nice tower; but in all of these towers the belfry looks in perspective as if it set inwards from the main face of the tower behind the buttress pinnacles. Huish Episcopi is the same, but St. Cuthbert's Wells and at Wrington the buttresses run up into spires above the parapets. The west door and big window over it enhance the richness of the Ruishton tower, which is picturesquely located, as seen in the accompanying reproduction of a photograph by Messrs. J. Chaffin and Sons, of Taunton.

The last visit on Monday was made to the church of Creech St. Michael, which, although by no means a remarkable building in any way, is worth seeing, failing more notable material. The old stocks in the churchyard remind the faithful on their way to and from the sanctuary how evil-doers at one time were punished in this world. The church has a west front which gains interest from the three niches round about the big windows, one on either side, and one over, containing the mutilated statue of The Majesty. From the N.E. the group is interesting, on account of the tower being half-way down the N. aisle. It is earlier than the church, and originally was groined in the early 14th century. An old prayer-desk of Jacobean Gothic stands in the choir, and there are a few niches devoid of their statuary. The south porch is a glory-hole.

Tuesday's weather at the outset was extremely wet; but after leaving Dunster Castle, about twelve, it cleared, and the afternoon was truly tropical. The first halt was made at Minehead, which was reached by rail from Taunton. Minehead comprises, as most visitors know, three divisions, Upper or Church Town, Lower or Quay Town, and Middle Town, though this central distinction is hardly ever now used. The churchyard affords a view of exceptional beauty over the swelling uplands beyond the level plain; or, standing under the weather-beaten Scotch firs, we glance down the slope of the steep hill, neath which lies the roof-tops in the town. The rocky islets of the Holmes break the crested waters of the Channel, and yonder skirt the coasts of Wales and Somerset. Fashion has done much to spoil Minehead, and so-called improvements follow in the train of contemporary events and desirable building sites for the horrors peculiar to the speculating builder. Much, in spite of all, remains, and although the church has been restored, it has been done carefully, and serves its sacred purposes without the hindrances of dirt and neglect, once the peculiar characteristics of too many ancient churches. We publish a view drawn from one of Frith's capital photographs, and a plan of the church supplied by Mr. J. P. St. Aubyn, who repaired and re-seated the fabric a few years ago. The screen, too, is represented among our illustrations from a drawing lent us by the architect; but the modern panelling at top has been removed. Few churches in the West of England are placed, says Mr. Page, in a situation so commanding as that at Minehead on the hill-side, with the quaint old thatched cottages with their yellow walls to give it scale against the sky, giving an almost

Continental effect. The church itself is mostly of 14th-century date, the tower having been erected somewhat later by perhaps a hundred years. There are some sculptures of interest on this building, as the majestic group on the towers, representative of the Trinity and St. Michael weighing souls. The screen forming the chancel dates from 1499, but it is not so fine as that of Dunster. The school children used to be located in the rood loft. The Bacton table monument is one over which many a discussion has been held, and the skeleton within it was found, they say, to have had two rows of upper teeth in the skull, sharklike—for Bacton was a lawyer. The chest in the vestry is particularly beautiful, with delicate and rich tracery panels, almost German in feeling, and the font, as well as the Jacobean altar-table, deserves special mention. Dunster, which we described last week, was next seen, and Mr. Luttrell received the party at the castle with great kindness, showing the plans and points of interest in the mansion. The church was greatly admired, for it is a grand building, and the screen is truly a fine piece of lace-like woodwork, set off greatly by the masonry of the central tower.

Next followed the Cistercian Abbey of St. Mary in the Vale of Flowers. Clive, better known as Old Cleeve, lies within easy walking distance from Washford Station, on the way from Taunton to Minehead, and is fairly familiar to all who know anything about the religious houses of England. It was one of the Dunster Mohuns, a liberal benefactor in the early days of this abbey's history, who named the place the "Vallis Florida," calling to mind "Strata Florida," the Westminster Abbey of Wales. The rapid stream, which runs with a brawling gurgle at the west side of the abbey precincts, was known as the Rood Water from the Holy Cross Chapel at Watchet, once called Watchet Ford, where the stream flows into the sea. Damp and low-lying sites were thus mostly chosen by the stern Cistercians, so that "the monks being often"—as St. Bernard says—"in ill health, and having death before their eyes, should not lead a careless life." The grounds are approached by way of an old bridge spanning the Washford Brook, and the whole place, thanks to the conservative care of Mr. G. F. Luttrell, of Dunster Castle, is now scrupulously preserved from further destruction. The beautiful ruin no longer serves as sheds for cattle or storehouses for farm produce, so that the architect and lover of old buildings need not, as heretofore, clamber up over sheaves of straw before being able to examine the grand chestnut roof of the refectory or the exquisite tracery of its windows.

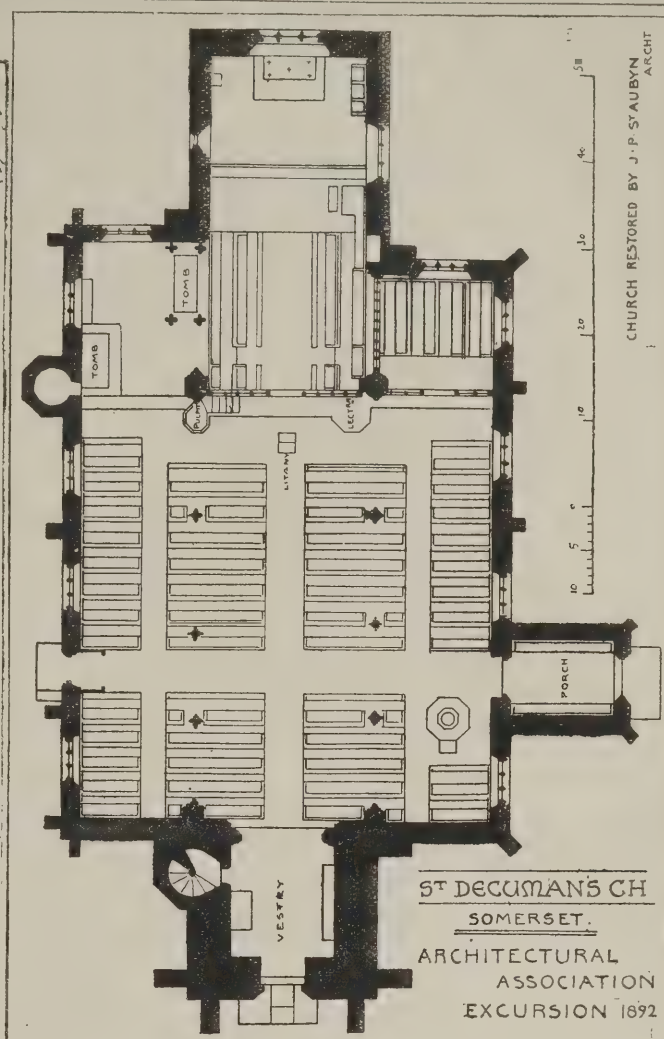
The first Abbot Ralph, with his twelve brethren, came from Revesby, among the fens in Lincolnshire, and the site for their new home was staked out with crosses of wood to mark the ground as intended for sacred purposes by Hugh the Abbot of Revesby, the very foundations of which have themselves been entirely eradicated. The founder of St. Mary's at Cleeve—William of Romare, Lord of Brlingbroke, grandson of the Earl of Lincoln—died in 1182, and the permanent buildings which he provided for were probably commenced some ten years later. "Cleeve," said the late Rev. Mackenzie Walcott, "was the grand-daughter of Rievaulx, to which Clairvaux, in France, sent the first colony." Every Cistercian minster had the statutable dedication of St. Mary. The church was excavated in 1875 at considerable expense, masons being employed under the zealous direction of Mr. C. H. Samson, F.R.I.B.A., to open up the doorways and windows still existing, and build in the openings which had been cut at various times in the conventual buildings. Carpenters renewed the floors, and the supervision of so eminent an authority as the late Mr. Walcott insured the discovery of anything likely to throw light upon a proper restoration of the long-lost plan of the entire foundation. A copy of this we print today with our two sketches of the refectory as it now stands.

The ruined minster measures 161ft. long, and, like Buildwas, which the A.A. excursionists saw last summer on the Shropshire excursion, was very severe in type, though somewhat later in style, being of the earliest form of 13th-century work generally known as the "Transitional." The floor of the church was covered with heraldic tiles, with the arms of many county names, some of which are still found at

St. Decuman's and Leighland. Similar tiles with floriated patterns are at Muchelney, which was seen on the Yeovil excursion. The piers in the nave were circular, and those in the transept were polygonal. The choir, as usual, was built first, with walls 6ft. 4in. thick. In the nave they do not exceed 4ft. in thickness. It measured 140ft. by 60ft., and was of five bays in length. Only the south walls towards the cloister now exist. The ritual choir, 40ft. by 20ft., accommodated the monks. Westward of this stood the rood screen, and the unusual arrangement of a longitudinal choir-screen also occurred here. The presbytery was square-ended and aisleless, measuring 17ft. deep by 29ft. in breadth. The usual eastern side chapels occur in both transepts. The conventual buildings, dismantled when

"Bluff Harry broke into the spence
And turned the cows adrift,"

soon became decayed, and at length a quarry. Cows calved in the sacristy, and pigs littered in the cloister; filth fouled the garth, while straw choked the calefactory. The central garden, with its pillared arcades and fountain, was, to the monk's eye, representative of the heavenly paradise, and the surrounding chambers, the Chapter house, the refectory, the cellarage, the dormitory, and the chapel, taught severally spiritual lessons to those who knew the mystic language of the age. The sacristy contains two aumbries, a recess for towels, and a laver where the celebrant washed his hands both before and after saying mass. The regular parlour was in the next chamber, and, like the last apartment, has a barrel vault, and is lighted by one lancet window. The Chapter House is an oblong, but is not divided on the common Cistercian plan into three aisles. This room measured 47ft. by 24ft., though the eastern bay under the munitment room has, unfortunately, been destroyed, two bays alone standing. They have quadripartite vaulting springing from the low shafts. The portal, as usual, to permit an unimpeded view of the interior from the cloister, consists of a large central arch flanked by unglazed windows. The sketch which we give shows the ruin as seen from the east, looking from the Chapter house into the cloister garth. A similar triple arcade exists at Buildwas and at Haughmond, visited during the Salopian excursion last August, and numerous other like examples could be mentioned. The daystairs leading to the dormitory come in front of the library or cloister ambury, then follows the slype, with cupboards for the monks to leave books and other things as they passed out to their work in the fields. The calefactory measures 60ft. by 22ft., and formed the "cella communis," with a fireplace which gave it its name. Doorways led from this to the convent garden on one side and into the Lower Gong on the other. The dormitory extends over the entire length of the eastern range of buildings, some 137ft. long by 24ft. 5in. wide, and is lighted by thirteen lancets on the west side and eight on the east. The dormitory for novices lost its floor at the extreme southern end, and in the S.W. angle is the door of the Upper Gong, or latrine, with a skew window. The arch is so ingeniously constructed, that the door, travelling on a spindle, always left half of the aperture open. The south side of the cloister was altered during the Perpendicular period. On the east side is the tresaunt, 30ft. long, leading to the garden. This shows as the first opening to the left of our upper sketch. At the end of it is the usher's door. The undercroft contains three chambers, originally intended for cellars. They are snug little rooms overlooking the garden, and excesses are thought sometimes to have been carried on here by weak brothers of the order, such as eating meat by stealth, and other minor wicked things. The large moulded arch in the wall marks the lavatory, which was thus in a recess. Shaving and hair-cutting took place here under the pent roof, now gone. The refectory on the first floor measures 51ft. 6in. by 22ft. 4in., and is Late Perpendicular in style, with a bell-cot high up in the wall, resembling one at Netley. The large traceried windows occur on both sides, the richer ones being on the south front, shown in the larger drawing on our double-page plate herewith. On this side is the fireplace, and flanking it is the reader's pulpit. The handsome, coved, hammer-beamed ceiling of chestnut springs from angel corbels, and over the dais are the remains of a painting of the rood, St. Mary and St. John, within a trefoiled arch. The buttery, called the painted chamber, and the abbot's solar are apart-



ments of interest, and the gatehouse, with its moulded arches, deserves mention. The holy rood is sculptured on the face of the abbey great gatehouse wall, but the building has suffered much from wanton mischief and impious folly. The upper part was recast in the 16th century.

The last place visited on Tuesday was St. Decuman's, where the beautiful ceilings over nave, chancel, and aisles are the great feature for study. They are perfect, and *en suite*. The barrel vault is divided in each case into panels by moulded and enriched oak ribs, and angel corbels occur along the exquisite frieze cornices. The slate-on-edge paving in the porch is a suggestion worth remembering. The commanding eminence occupied by the church makes it a very prominent object both from land and sea, set as it is on a hill overlooking Bridgwater Bay. St. Decuman, the legend says, was a Welshman, and his means of locomotion seems to have been peculiar, though exact details of his singular passage over the Bristol Channel from Wales are uncertain. Authorities differ—some saying the saint's method of transit was on a faggot or hurdle, and his lactiferous companion, the cow who afforded him sustenance, came of her own accord, and accompanied him in all his wanderings. He made his home on this hill where the church now stands, and here it was that the martyrdom of the hermit saint took place. He was decapitated; but rising above the difficulty of the situation, he picked up his head and bore it to the spring of the Holy Rood at Watchet to wash away the gore. Then jumping into the sea, he swam back to Wales with his head under his arm. History fails to state what became of the cow.

We publish herewith a plan of the church, which has been restored by Mr. J. Piers St. Aubyn. It is also remarkable for the loyal Wyndham tombs and ancient brasses on the east wall of the north chapel. The brazen bas-reliefs and heraldic bearings of these personal memorials are particularly well cut with interesting inscriptions. Sir John and Lady Florence Windham, who died in 1572 and 1596 respectively, hold converse thus with Fate on theirs:—

'MARITUS. When changeless Fate to death did change my life
I pray'd it to be gentle to my wife
Vxon. But shee who hart and hand to thee did wedd
Desired nothing more than this thie bedd
FATUM. I brought ye soules that linckt were each in either
To rest above ye Bodies here together."

John and Joan Wyndham have embossed and gilded portraits of about 40 years later, and note also the Caroline pew. Edmund Windham, whose figure lies in front of the altar rails, died in 1616. Hard by to this is the loyal Sir Hugh Wyndham, who served that selfish profligate, Charles II., and died unrewarded—

Here lies beneath this ragged stone
One more his Princes then his owne
And in his martred Father's warres
Lost Fortune Blood gained nought but scarres
And for his sufferings as reward
Had neither countenance or regard
And earth affording no release
Is gone to Heaven to ease his greese."

The table monument with the rich slab of blue marble is to the Earl of Egremont, in the north chapel of the choir. The font stands on a carved shaft upheld by angels. The chancel contains some Early English work; but the church is chiefly Perpendicular in style. It has a plain tower, and there are the remains of a screen more simple in design than others hereabouts, and some of the pillars have niches; but the iconoclasts removed the figures long ago; but one still has an ecclesiastical worthy in each of the four recesses, while to the rear of the Jacobean pulpit, with its sounding-board, are effigies of St. George and the Dragon, together with a Bishop. An hour's railway journey brought the excursionists back to Taunton, after an enjoyable and somewhat tiring day. The illuminations in the town concluded the proceedings so far; but we shall finish our notes of the rest of the week's doings next Friday.

STABILITY OF WALLS ON SOILS.—III.

Frictional Stability of Soils.

THE lateral frictional reinforcement of the support of piers afforded by the contact of the soil with the peripheries of their foundations is not so generally recognised as it ought to be, as frequently its power of reinforcing the sup-

port due to the actual pier-base is of so sensible an amount, that its effects are unmistakably evident, and cannot be ignored.

The support of bearing piles in soft soils is frequently due solely to this source of friction of the soil against their submerged periphery, and in this manner each pile frequently sustains a load of 20 tons and upwards. Mr. Bidder, C.E., considered 12 tons per pile of 12in. sides square section a safe load for piles driven in clay (*Proc. Inst.C.E.*, June 23, 1846).

It may be useful to note the following confirmatory practical data in connection with the subject of lateral frictional support. Mr. A. C. Hurtzig, C.E., in 1880* made tests of the power required to draw each of 420 12½in. square piles of rough-hewn Memel balk timber, which had

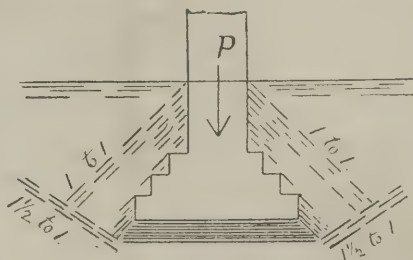


FIG. 10.

been driven five years in the Hull Docks, in about 13ft. of stiff blue clay, with 3ft. to 5ft. each of peat and silt and sand above it. The piles had an average superficial submergence of 76sq.ft. The net resistance to drawing was 1,875lb. per square foot in contact with the soil. Mr. Hurtzig made a comparison of the frictional resistance of these piles to driving, as taken from existing records of driving them, and found a very close correspondence between it and the amount of frictional resistance in drawing the

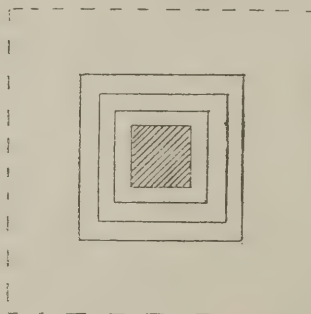


FIG. 11.

same piles, and also with their supporting power.

The following ultimate loads were applied to test piles, chiefly in connection with the construction of American works:—

- 600lb. per square foot of surface immersed in 9ft. sandy mud, 5ft. sand, 5ft. sandy clay, and 10ft. of fine clay = 29ft.
- 320lb. do. 15ft. in soft river-mud.
- 1,900lb. do. 16ft. in clean white sand.
- 1,850lb. do. 20ft. = 2ft. blue clay, 3ft. gravel, 5ft. stiff red clay, 2ft. quicksand, 3ft. red clay, 2ft. gravel and sand, and 3ft. stiff blue clay.
- 600lb. do. 32ft. in river-sand.
- 800lb. do. 16ft. in "alluvial mud."
- 1,400lb. do. 35ft. in sand and gravel.

The lateral frictional support of piles, and likewise of masonry piers, is, as may be observed from the foregoing, in proportion to the nature and extent of their immersed perimeter, as well as the frictional character of the soil with which they are in contact. Isolated piers of square or rectangular section present the largest perimeter per area-unit of its section to the action of lateral friction. The nearer their form is to the exact square section, the greater is the lateral support derived. The smaller the area of this or other form of section, the larger is the proportion of the perimeter. Thus, for a square area, the area equals the square of the side, whereas the peri-

meter equals the sum of the sides, or four times the square root of the area of a square. For rectangles, the area = product of two adjacent sides, the perimeter = the sum of the four sides. The smaller the measuring unit employed, the more apparent does the advancing excess of area over perimeter become. Thus, if inches instead of feet be used in measuring a 2ft. square section:—

Side.	Area.	Perimeter.
2ft.	4ft.	8ft.
24in.	576in.	96in.

An oblong made up of two equal squares placed side by side will have double the area of the single square pier-base, but will only have three-fourths of the single perimeters of both the single squares. Hence, in designing pier foundations, it is obvious that the loads should be distributed into a series of equal weights, so that the supporting piers may be of uniform size and geometrical shape, and also be constructed of like materials and prepared in similar class of workmanship. Thus only can a uniform co-efficient of lateral frictional support be assured in the same soil so as to insure uniform settlement of the building throughout its extent in all its parts. The following experimental data are added to form an idea of comparison between timber and masonry frictions in soils. These co-efficients of friction are the proportion of the pressure which produced them at the beginning of motion:—

	Dry.	Wet.
Granite, roughly worked, on gravel and sand	·43 ..	·41
Granite, roughly worked, on sand ..	·65 ..	·47
Granite, point dressed, on sand ..	·40 ..	—
Granite, point dressed on gravel ..	·60 ..	—
Ditto on dry clay	·51 ..	·33
American marble, sawed, on clay ..	·40 ..	·55
Pine, sawed, on gravel and sand ..	·41 ..	·41
Ditto on sand	·66 ..	·58

Note.—American marble with sawed surface may be taken as about equivalent to sawed limestone or sandstone.

A square pier, represented in elevation and plan by Figs. 10 and 11, may be assumed to produce lateral frictional area equivalent to the base of a truncated pyramid spreading round it in more or less extent of inclination of its sides according to the nature of the soils in contact with its periphery, the natural slope of the soil upon itself, and also upon the material of the pier surface. A circular pier likewise produces the equivalent of the base of a truncated cone. The extent of the base of such assumed equivalent pyramid or cone is, roughly speaking, represented at a line of intersection of the plane of rupture of the soil upon itself, say 1½ to 1, and the plane of the slope of repose of the soil upon the material of the pier, say, 1 to 1. The extent of such assumed reinforcing frictional base is here indicated by the space in the plan, Fig. 11, included between the dotted square around the square foundation and its outline.

In this assumed method of illustrating the equivalent of the lateral frictional action of the soil, when there has been a slight subsidence of the portion of the soil immediately underneath the pier base, a plane of rupture is brought to a bearing against the base of a pyramid of soil, and thus the lateral friction induces a reaction of the supporting soil which reinforces that immediately underneath the pier base.

It is not insisted that such an arrangement of masses of the soil is exactly reproduced in practice with such methodical disposition of planes, counterplanes, pyramids, and cones, as the conditions of the soil, active or passive, attending the initial settlement of the pier may create a multiplicity of annular planes and concentric sections of pyramids up around the sides of the pier, or of cones for round piers, as the case may be.

Ground Slips and Subsidences.—Another important condition which may vitally affect the stability of foundations is whether the surface of contact of underlying beds of the soils be level or inclined. If this surface of inter-contact be inclined, the upper bed will in time slide down upon the lower bed and carry the building with it. This is more liable to occur when permeable beds cover impermeable strata, and moisture has access to the impermeable surface. Such cases occur in connection with the London clay. The red or reddish-drab variety of clay is the weathered crust of the blue clay which it overlies; its reddish colour is due to the oxidation of the iron components. The surface which separates them from the blue may be more or less well defined, and when occurring in rising ground

may cause slips and subsidences, even where the geological deposit is quite level. Incidental drainage in the locality arising from wells, deep pits, cuttings or tunnels, drainage works, or dry weather may cause contraction of the mass and produce deep fissures, with the attendant facilities for access of moisture.

Landslips on Sidelong Ground.—Foundations on sidelong or hillside sites are frequently attended with landslips of a more or less serious character. The disposition of the stratification is sometimes favourable to such slips, especially when pervious and impervious soils are contiguous, and a disturbance of the surface soil as sod, &c., at upper levels permits of the percolation of surface water. On other occasions drainage of the upper levels of the ground by natural or incidental causes, and a succession of dry weather, may cause deep fissures that receive surface water, which may thereby have access to clay beds, shale, &c., which thus become softened.

Slips caused by "made" ground, infillings of stone and lime quarries, or ballast, gravel, sand, and clay pits and deep cuttings which have been done several years, may not be suspected. Any set of conditions which admit of the percolation of water at upper levels of the ground, and its subsequent access to masses of clay, loose earth, sand, &c., may cause dispersion of the one or softening of the other, or the damming up of water between imperious beds may cause the bursting out of springs or water-courses which permeate the intersurfaces of contiguous superimposed beds which are disposed to separate along their surfaces of contact.

Any alteration in the surface or other change which tends to localise the permeation or flow of ground or surface waters, or that aids in creating water seams, through fissures, veins, or the junction surfaces of superimposed beds, will cause subdivisions of the masses. Conditions of this nature are specially liable in chalks, which have a strong affinity for water, when affected by rain, frost, or thaw, or by the vibration caused by moving masses, as heavy machinery, railway trains, blasting operations, firing of heavy artillery, &c.

"Firm Earth."—The term "firm earth" frequently occurs in describing soils of foundations; but probably no two persons would give the proportional constituents of what they call "firm earth" precisely alike. What it really means to one person and in one locality will differ more or less widely from those of other persons and other localities, not only as regards actual present bearing power, but also as regards permanence of stability, as well as degree of tendency to processes of transitional forms, in which the bearing power may be greatly decreased. The term "earth" in this respect is of very vague significance, as it may mean any of the various materials as they occur in natural mixture in the composition of the crust of the earth, as distinguished from solid rock, unmixed sand, or gravel. Earth may therefore mean clay, loam (or sandy clay), marls (in which clay and lime are considerable ingredients), or any mixtures of these with vegetable matters, or their derivatives, in all variety of composition; or it may mean clean, dry gravel—clean, sharp sand. Such a term is too vague to be used in describing foundation soils, and it is surprising that it is so used in textbooks. It is much better to use terms which will indicate the main ingredients of the soil.

Law of Subsidence in Alluvial Soft Soils.—

1. When the pressure upon the soil increases in an arithmetical ratio, the subsidence increases in a geometrical ratio.
2. When the depth of the foundation from the surface of the soil increases in arithmetical progression, the subsidence decreases according to a geometrical series.

The above law is of great importance, and should be carefully considered. No. 1 shows how aggravated is the subsidence as compared with increase of pressure, and explains the reason of the serious displacement which occurs when a soil is unequally loaded by contiguous parts of the same building, or when the unit area pressure of adjacent buildings is unequal. No. 2 is equally important, as it explains how much more liable buildings are to settle when the foundations are put too near the surface, which is a frequent vice in jerry building; but likewise occurs, through want of appreciation of the law, principally in country districts, when small houses of one or two stories will develop cracks and fissures in the fenestrated walls.

"Made Ground" in Building Sites.—"Made" or artificially filled-up ground is to be met with in many building districts. Where it occurs, it frequently occasions more or less disaster to the building, even where provision has been made, which proved inadequate. Many disastrous cases have occurred where made ground had not been suspected, and hence sufficiently intelligent examination of the soil had not been made. Greater danger occurs when made ground only covers a part of the site, and hence when the bearing power of the made ground may be but a small fraction of that of the adjacent natural ground. Most of the "fills" consist of city or town refuse, mixed with animal and vegetable matter, asphalt and furnace ashes, &c., which has been dumped into old quarries or pits from which sand, gravel, ballast, or clay has been taken, old privy vaults, &c. It is seldom that made ground can safely be trusted with more than a quarter to one-third of a ton per foot square of footing base, and much of it would be unsafe with one-eighth to one-tenth of a ton per square foot.

Bearing Power of Foundation Strata.—The use of the term "rock" for foundation stratum is of vague significance, as it includes chalks, limestones, sandstones, granites, ragstones, &c., all of which kinds have widely different cohesive powers and densities, as well as different qualities in each kind, and there is likewise great difference in permanence of each kind and quality. The term "hard" prefixed to rock is likewise indefinite, and likely to be interpreted differently by different minds, the surface of rock foundation being more or less oxidised, and its cohesion thereby lessened.

The following safe bearing powers are taken at about one-tenth of crushing resistance in tons per square foot:—Chalk, $1\frac{1}{2}$ ton per square foot, when solid. Limestone—crystalline, 25 tons to 70 tons; dolomite, 28; oolites, 7 to 10 tons; soft limestone, $5\frac{1}{2}$ tons. Sandstones—strong, 25 tons; ordinary, 19 tons; weak, 10 tons. Granites, 76 to 140 tons; when in large tracts in thick, solid masses, 180 to 200 tons. Factor of safety in the following is 3 to 5:—Gravel and coarse sand, well compacted *in situ*, and protected from water and lateral "flow," 4 to 6 tons; sand well compacted, and not liable to lateral disturbance, 6 to 8 tons; sand not well compacted, 1 to $1\frac{1}{2}$ ton; clay, in thick, compact beds, and always dry, 4 tons; clay, moderately dry and compact, 2 tons; clay, moist, moderately soft, 1 to $1\frac{1}{2}$ ton; London blue clay, $1\frac{1}{2}$ to 2 tons; red ditto, hard, when not too near surface or containing gravel, 4 tons; blue clay, $\frac{1}{2}$ to $\frac{3}{4}$ fine sand and $\frac{1}{2}$ water, weighing 80lb. to 100lb. per cube foot, 2 tons; yellow clay, mixed with sand, $2\frac{1}{2}$ tons; ditto, near surface, and subject to moisture, $\frac{1}{2}$ ton; compact sand, with slight mixture of clay, $2\frac{1}{2}$ to 3 tons; compact clay, stony, 5 tons; alluvial soil or quicksand, according to moisture present, $\frac{1}{2}$ to $\frac{3}{4}$ ton. The stability of clay and alluvial soils is increased by admixture of sand and gravel. A 3ft. or 4ft. layer of hard clay resting on soft mud, which overlies a stratum of quicksand, $1\frac{1}{2}$ to 2 tons produced subsidence of 1in. per ton in one year. Loose gravel is compacted by grouting. Foundation soil of Hotel Métropole, Brighton, consists of 90 per cent. of geological debris of flint and gravel, of pieces of 3in. and smaller, and 10 per cent. of chalky clay, almost dry— $2\frac{1}{4}$ tons. In a recorded case a blue clay that contained one-third of its bulk of fine sand, and one-fourth to two-fifths of water in its composition, showed an ultimate bearing power of 6 tons per square foot. This was considered safe with a permanent load of one-third, or 2 tons per square foot. The permanent unit pressure on the foundation substratum of tall chimney-shafts, high towers, steeples, &c., should include due allowance for the vertical component of wind-pressure according to the range of its intensity. Light structures which have heavy running machinery that causes a maximum of vibratory disturbance, should have a minimum unit of static pressure on the foundations. Heavy structures with quiescent loads should have maximum unit of static pressure.

Unequal Settlements of Adjacent Parts of Building.

—These can only be avoided by the exercise of due skilfulness in all the processes of the design. (a) In systematically concentrating the loads and pressures at convenient points, and as far as possible in equality of amounts, to obtain a large duplication of parts; (b) in placing the supporting bases concentrically under the axis of these

points of load concentration; (c) in neutralising all abutting thrusts by a proper disposition and form of the masonry or other structural materials to insure vertical resultants of forces and economical execution; (d) the correct statical analysis of loads of all fenestrated walls; (e) correct estimation of all loads and pressures, and their due adaptation to the bearing capability of the soils dealt with.

Note.—The more compressible the soil the more exact should be the estimation of the loads. The "law of subsidence in alluvial soils" should be kept in view.

(To be continued.)

MORTAR.

IN a previous article, under the heading "Brickwork," was stated the surprising strength of waterbound brickwork, as illustrated by the difficulty experienced of separating its constituent parts by means of steel-pointed wedges driven by sledge-hammers, or, as they are more frequently named by those who use them, "flogging-hammers."

The cohesive and adhesive strength of mortar in waterbound brickwork is due not to its peculiar hardness, for that is a quality which it cannot be said to largely possess, but is due rather to its elasticity; for it is frequently found when cutting away or removing portions of this kind of work that a stout chisel may, without experiencing much resistive force, be driven into the mortar joints without any apparent effect beyond that of displacing so much of the mortar as previously occupied the space taken up by the chisel; the larger portion of the displaced mortar being driven into a closer molecular proximity than previously existed. The ancient Romans, who seem to have done all things well, are accredited with the practice, in the preparation of their mortars, of forming pits and burying the newly-made mortars for a considerable time before using them; a statement sometimes adduced (and not unreasonably so) to account for the strength and durability of their work. In criticising the remains of old work, it is well to remember that in that, as in all things, we have the survival of the fittest; that the bad work of the ancients (if they did any) is gone, like Prospero's "insubstantial pageant faded," leaving "not a rack behind," and we are left only with the good from which to draw our inference of the whole.

Such a process of mortar-making, however desirable, cannot in these go-a-head days, heavy city ground rents and suburban building of mushroom growth be now indulged in. But the really practical man is often astonished to find in specifications emanating from high places the following words:—"No more mortar to be made up at one time than is necessary for the day's consumption." This is a necessary provision when building in the winter season, and it is necessary to provide at other seasons that the mortar shall not lie about in thin isolated beds or layers until all moisture is extracted from it. But it is desirable under all other circumstances that it be allowed to lie sufficiently long to admit of the unequally burnt parts of lime taking in sufficient moisture to make them soluble, as lime that is not well burnt imbibes water very tardily.

Where this is not done these parts will slake in the brickwork, forcing out portions of joints in their immediate vicinity, and raising considerable portions of the overlying brickwork off its beds. Such under-burnt parts of lime are, when slaked, distinguishable by a dark bluish-grey colour, and if exposed sufficiently long to the air, will resolve themselves into a fine powder.

The limes in general use in and about London are the Dorking, the Merstham, and Hailing, and are known as grey or stone lime. These limes are used for the first and second coats of the plasterer—viz., the rendering and floating coats—as they acquire in setting a hardness which the chalk or pure limes never attain, the chalk lime being suitable only for the third or finishing coat, known technically as "setting," and which acquires its hardness by the process of trowelling to which it is subjected by the plasterer when mixed with about one-third of fine washed sand, or are otherwise gauged with plaster of Paris.

Well-burnt greystone limes imbibe water greedily, slake freely and quickly if supplied with sufficient water, while the eminently hydraulic limes imbibe water less freely, and slake very tardily, and for this reason blue lias

lime, when in the lump, should be covered over with sand for two or three days, and copiously supplied with water, before putting it in the mortar-pan, the wet sand retaining some of the water applied, and to some extent preventing the escape of the heat generated in the incipient stage of the slaking process, which two factors combined are generally considered to accelerate the slaking.

The advantage claimed for mortar that has been made up sufficiently long to allow it to properly cool is that the outer skin of the mortar-heap becomes sufficiently hard by the process of surface evaporation and the attraction of atmospheric carbon to imprison within the bulk sufficient moisture to slake the badly-burnt portions of lime, in the shape of "core," that may be in the mortar, to set up in its incipient stage the chemical action which we are told takes place between *silex* or sand-grains and dissolved lime, coating the individual grains or *nuclei*, and filling up the microscopic spaces which must exist between all angular grains, however small they may be.

By a proper process of retempering the mortar, the particles are driven closer together, the excess water is eliminated, and the mortar acquires a characteristic known to workmen practised in the use of mortar by the name of *toughness*, in which state it can be used with infinitely less liability to shrinkage than a newly-made mortar.

Walls built with retempered mortar and bricks sufficiently wetted—that is, wetted to a degree short of absolute saturation—a degree which can be better determined by the practical workman than prescribed here—produces the best results. By all means avoid the use of super-saturated bricks.

It not infrequently happens that a bad mortar is produced from good material, and the one chief thing productive of this is the modern mortar-pan, coupled with the impractical idea of many of our so-called builders of to-day (largely—very largely—recruited from the ranks of builders' clerks, with a knowledge of building commensurate to the making out a list of items under the head £ s. d., and circumscribed by the four edges of a sheet of foolscap) that any unskilled workman (i.e., unskilled in that particular branch) can turn out a bed of bricklayers' mortar. This work more often than not is assigned to the engine-driver, who does the double duty of engine-driver and mortar-pan attendant. If he be a competent driver, the chances are that he knows little, and cares less, about mortar; and years of practical experience in the supervision of work has taught the writer that the mortar is turned out of the pan either imperfectly incorporated, or, what is more frequently the case, is overground to such a degree as to be little better than mere dust when dry, the grit and body of the sand being ground out of it.

The objection to loam in sand is that it deteriorates the setting and indurating properties of the lime, coating the sand grains and forming a separating medium between them and the lime, to the injury of the tensile and cohesive strength of the resulting mortar. Mortars made of unclean or loamy sand are very liable to shrinkage and cracks. The use of water impregnated with loam or clay should be avoided, both in slaking the lime and in retempering the mortar.

F. WALKER.

PRIVATE ROAD AND STREET-MAKING.

THE necessity of controlling the formation of private roads and streets in the Metropolis is yearly increasing in importance. The estate building mania continues to an alarming degree; roads and streets are multiplied without hindrance, and the ratepayers are called upon to pay their proportion towards the formation and maintenance of new streets, which are not only uncalled for as public routes, but destructive of all privacy and residential quiet. We have called attention to the necessity of imposing some restraint on owners of estates and speculative builders in this respect, for we see quite plainly that the principle of the estate owner who lets his land to middlemen and builders, is to allow as many roads as can be cut through the land for the sake of improved ground-rents. Cover the land with houses is the idea of the speculator, who wishes to recoup himself for the outlay, not heeding the sensible advice that it is better to wait than to build upon the land all at once, as every estate

agent knows nothing depreciates a building estate more than to see a large number of new and unlet houses and carcasses. In every part of the Metropolis we find an unseemly haste to utilise every foot of frontage that can be got out of the land. Roads are run through an estate in parallel lines every 70ft. to 80ft. apart, which allow only houses and back yards, about 35ft. or 40ft. deep inclusive, to be placed back to back. This hurry on the part of the land-jobbers is intentional; the roads restrict the requirements of would-be purchasers and tenants; that is, they prevent them from obtaining a longer back area as a garden, and when once the houses are plotted out or commenced, alterations cannot be made, and tenants are obliged to be satisfied with what they can get. Proposed legislation has also hastened the formation of estates, and we believe many of the new roads and streets have been made before any regulation comes into operation to enforce a sufficient area of open space to be given to every dwelling-house. It is for the London County Council to be equally alert, and to pass as quickly as possible a law to compel every builder to give a curtilage of sufficient depth to every new house that is built in or near the Metropolis. This open space or curtilage should increase as the distance from the centre of London increased; instead of which, we find the open areas allowed in new suburbs three or even five miles from the City much smaller than they are in houses of a mile or two distant—an anomaly that legislation only can remove. The Building Act Committee of the London County Council have suggested, as our readers know, a rule by which the open space in the rear of buildings can be regulated with something like efficiency; but we think this rule, or angle of 45°, should be the minimum, and that the angle bounding the premises should be reduced in the suburbs. In fact, the Metropolis could be divided into zones for this purpose. But the question of open area resolves itself into the distance apart of new streets in the first instance, and if these were ruled by a schedule, the evil of overcrowding would be abated as a consequence. The architectural profession has a stake in this question. Many of the surveyors having control of building estates have an interest in maintaining the architectural character of the estate—that is to say, in having buildings erected of good design, which can only be possible when the roads are planned at such a distance from each other as will enable artistic elevations to be erected. The more numerous the streets, the closer are houses placed, and the more remote is the opportunity of the architect's employment. The Private Streets Works Act, which is to apply to any urban sanitary district, might be usefully extended to restrict the number of private streets.

OBITUARY.

MR. WALTER KIRKWOOD, senior partner in the firm of W. and J. Kirkwood, contractors, Edinburgh, died on Thursday in last week at the age of 61. Mr. Kirkwood was widely known in the building trade, having been concerned in the erection of several of the most important buildings in Edinburgh and neighbourhood—amongst others, St. Mary's Cathedral, the new University buildings, and the McEwan Hall, the National Portrait Gallery, the new Caltoun Gaol, Gosford House, and many other noblemen's mansions throughout the country. He was also engaged at the time of his death in arranging for the erection of the Scottish National Observatory on Blackford Hill, recently illustrated in these pages. Mr. Kirkwood always took a sympathetic and enlightened view on all matters relating to the wages and well-being of his firm's workmen, and, as the originator and president of the Boards of Conciliation between employer and employed, he was very largely instrumental in promoting harmony between capital and labour. He was also at the time of his death president of the Edinburgh and Leith Master Builders' Association. According to the *Scotsman*, "the point of Mr. Kirkwood's character which was most striking was his unflinching uprightness and honesty of purpose, which gained him the deep respect of everyone with whom he came in contact. This outstanding quality was combined in a rare degree with great business capacity." He had been in his usual health till Wednesday, when he was seized with a shock of paralysis, and death ensued the following day.

Mr. Kirkwood is survived by a widow, four sons, and three daughters.

Mr. Robert Wilkins, the founder and for many years the principal of the firm of R. Wilkins and Sons, builders and contractors, of Surrey-street, Bristol, died at Ilfracombe on Tuesday week, aged 82 years. The funeral took place on Saturday at St. Paul's Church, Portland-square, Bristol, and was largely attended. For the past few years, owing to age, Mr. Wilkins had been unable to take an active part in the business of the firm. He commenced business in 1851, and retired from the firm in 1882. During the last few years of his business career he was engaged in the erection of many large public buildings, churches, and chapels in the city and its suburbs, among the more prominent being the Congregational Church, Clifton Down; rebuilding St. Paul's Church, Clifton; enlargement of Merchants' Hall, Grammar School, Assize Courts, taking down St. Werburgh's Church and rebuilding the same, and Messrs. Dunlop's premises.

CHIPS.

At Salonica, in the ruins of the mosque of St. Sophia, destroyed in the fire of 1890, important discoveries have been made bearing on the Byzantine period. On the top of the minaret, which, before the fire, could be ascended only by Moslems, Professor P. N. Papageorgion has discovered and deciphered the sepulchral stone of an archbishop of Thessalonica hitherto unrecorded. It bears the name of Gregorius, and the date of his death is 1335. Some mural paintings of Greek saints bearing inscriptions have also been found.

In executing some works at the port of Carystus in Euboea, many blocks of stone, formerly united together by iron staples fixed by molten lead, have been found, together with fragments of sculpture and inscriptions. Near them were found marble columns, with fragments of sculpture. The inscriptions brought up by the dredge are, for the most part, dedicatory and sepulchral, and belong to the period of the Roman occupation.

The parish church of Rothwell, North Northamptonshire, is undergoing restoration at a cost of about £800, from plans prepared by the late Mr. J. D. Sedding. In the chancel the floor has been repaved with Devonshire marble, new stalls of oak provided, and also new hangings for the sanctuary. These works have been carried out by Messrs. Trask and Son, of Norton, Somerset. The bells are being re-hung by Messrs. Warner and Son, of London.

The ceremony of laying the memorial stone of a new bridge over the Clyde at Cambuslang was performed last week. The engineer of the bridge is Mr. Crouch, C.E., Glasgow, while the contract is let to Messrs. Paton and Thomson, Glasgow; the ironwork being done by Messrs. Alexander, Findlay, and Co., Motherwell. The structure will cost about £10,000.

A new Mission Room in Brick House-lane, West Bromwich, was opened by the Lord Bishop of Lichfield on Wednesday week. Messrs. H. Smith and Son, of West Bromwich, were the contractors. Messrs. H. Smith and Son's tender has also been accepted, and the contract signed, for a new vicarage for the Vicar of St. Paul's, Gold's Hill, West Bromwich, and the work will be proceeded with at once. The designs in both instances have been prepared by Mr. Jno. W. Allen, of West Bromwich.

On Tuesday last the Mayor and Corporation of Stafford visited the new baths to start the large clock which has been given to the town by the Right Hon. Earl of Shrewsbury and Talbot. The construction generally is from the designs of Lord Grimthorpe. Messrs. John Smith and Sons, Midland Clock Works, Derby, carried out the whole of the work.

The Llanelly School Board have instructed their architect, Mr. J. B. Morgan, M.S.A., to prepare plans of a school for the Dock district, to accommodate 300 children; also one for Machynis for 200, and to enlarge Powlyeats School.

Messrs. C. C. Dunkerley and Co., the old-established iron and steel merchants, of Manchester, have, we understand, decided to stock steel girders in large assortment, and their arrangements are so far advanced, that several consignments, embracing all the leading sections, are now in course of transit to their Manchester warehouses. This firm has maintained for many years past a large and varied stock of iron girders, channels, flitches, &c., and is favourably known throughout the building, engineering, and allied trades of the country. To this stock, steel girders will now form a very useful supplement, and we have no doubt whatever that Messrs. Dunkerley and Co. are acting wisely in thus keeping pace with the times.

CONTENTS.

Architectural Tourists...	237
Theatres.—V...	237
The Architectural Association Excursion.—II...	239
Stability of Walls on Soils.—III...	242
Mortar...	243
Private Road and Street Making...	244
Obituary...	244
The Building News Directory...	XIII
Our Illustrations...	245
The Select Committee's Report on Theatres and Music Halls...	245
Competitions...	245
Architectural and Archaeological Societies...	245
Wayside Notes...	264
Collapse of Flooring at a Bakery...	264
Prices.—XLIII...	265
Osborne House...	266
Building Intelligence...	267
Engineering Notes...	268
Correspondence...	268
Intercommunication...	268
Legal...	268
Legal Intelligence...	269
Water Supply and Sanitary Matters...	270
Our Office Table...	270
Trade News...	270
Tenders...	271

ILLUSTRATIONS.

ARCHITECTURAL EXCURSION SKETCHES.—MOSLEY HOTEL, PICCADILLY, MANCHESTER.—ALTAR-PIECE, BY CARLO CRIVELLI, AT THE NATIONAL GALLERY.

Our Illustrations.

ARCHITECTURAL ASSOCIATION EXCURSION SKETCHES.

THE account of the proceedings, which we print on p. 239, contains descriptions of or references to these drawings of Old Cleeve Abbey, Minehead Church, and the Yarn Market at Dunster. The illustrations printed with the text show the Rood Screen, Minehead Church; Poundisford Park; Ruishton Church; a plan of Bishop Lydeard Church, and two further views of the monastic buildings at Old Cleeve.

MOSLEY HOTEL, PICCADILLY, MANCHESTER.

THIS hotel, which is now in course of re-erection, partly on its old site and partly on land adjoining, and belonging to the same proprietors, is one of the oldest commercial hotels, and occupies one of the most commanding sites in this city, being immediately opposite the very large open space in front of the Royal Infirmary. For many years the Lord of the Manor, Sir Oswald Moseley, held his court in the old buildings, which was followed by the usual dinner to the tenantry, and until recent times the rent audit has also been held here. The premises are intended as a high-class commercial and family hotel, and will be fitted especially with a view to these purposes. On the ground floor will be commodious smoke and stock rooms, under which will be the billiard-room, and on the first floor will be the coffee, commercial, drawing, and writing rooms, together with arbitration rooms and a large room for restaurant and auction sale purposes. On the five floors above this will be about eighty good bed and sitting rooms, and the kitchens and sculleries are placed on the top floor. The premises will be fitted with passenger elevator and luggage lift, and lighted with electric light. Great care will be taken to make the heating and ventilation successful, and the lavatories and bathrooms throughout will be fitted with all the latest and most efficient sanitary appliances. The new buildings are being erected from the designs and under the superintendence of Mr. J. H. Andrews, architect and surveyor, of 20, Cross-street, Manchester, and the contractors for the whole of the works are Messrs. W. A. Peters and Sons, of Rochdale.

ALTAR-PIECE BY CARLO CRIVELLI, ST. PETER AND ST. CATHERINE.

THE Madonna and Child which form the centre of this altar-piece were illustrated in our pages on May 6th last, and we publish Mr. W. S. Weatherley's drawings of the remaining two figures, SS. Peter and Catherine, to-day, thus completing the central panels of this great work by Carlo Crivelli, which comprises thirteen compartments in all. The altar-piece is dated 1476, and is in the National Gallery. We refer our readers to the BUILDING NEWS of the above date for further particulars concerning it.

THE SELECT COMMITTEE'S REPORT ON THEATRES AND MUSIC HALLS.

THE Select Committee of the House of Commons appointed to inquire into matters relating to the licensing and regulation of theatres and places of entertainment have just issued their report as a bulky blue-book of nearly 600 pages. The committee, of whose members, it may be mentioned, only one, Mr. Lewis H. Isaacs, was an architect, do not suggest any alteration in the management of theatres or music halls by public authorities in the provinces, or in Scotland or Ireland. With regard to the Metropolis, they recommend that a standing arbitrator be permanently attached to Her Majesty's Office of Works, to whom any dispute on structural matters be referred. They also strongly recommend that in the exercise by the London County Council of its functions as regards structural matters generally, the professional adviser of the Council should be given as far as practicable a position of independence, a free hand, and an undivided responsibility, in order to secure a uniform policy and procedure, and to avert causes of controversy. They do not concur with the desire of the London County Council to act as the licensing authority of London theatres, the evidence showing that the jurisdiction of the Lord Chamberlain, as at present existing, gives entire satisfaction. They suggest that the licensing authority for London music-halls should be a small standing joint committee of the County Council and of the Quarter Sessions. The framers of the report state that the vast improvement in the structure of London theatres during recent years has been mainly due to the zealous efforts, first, of the Metropolitan Board of Works, and afterwards of the County Council working through its Theatres Committee. The committee agree with the County Council that when owners or lessees have fairly fulfilled obligations imposed upon them by the Council, they should have safeguards against unnecessary interference during a certain term of years, during which no further requisition for structural alterations shall be made. The witnesses examined by the Committee, and whose evidence is given in full, included Mr. T. Blashill, superintending architect L.C.C., Mr. C. J. Phipps, and Mr. Walter Emden.

CHIPS.

An unpleasant duty fell upon Col. C. O. Ellison, the first president of the Society of Architects, on Wednesday, as one of the magistrates for Liverpool. Col. Ellison received a peremptory message on the previous afternoon from the Governor of Walton Gaol that his presence would be required at the execution of one Patrick Gibbons, who was to be hanged for the murder of his mother. Col. Ellison duly attended, when the governor explained it was absolutely necessary that a borough magistrate should sign certain documents in connection with the execution. At a meeting of the city justices, Col. Ellison indignantly protested against the custom, and the magistrates' clerk was instructed to look into the legal aspects of the question.

The chairman of the Colwyn Bay Local Board formally opened on Wednesday a new marine drive at that watering-place, which has been constructed at a cost of £8,000.

During the absence of the Queen and Court extensive renovations are being carried out at Windsor Castle. The interior of the grand reception-room in the Cornwall Tower, which is adorned with the "Golden Fleece" tapestries, is being regilded, and new heating apparatus is being arranged for the warming of the royal apartments on the south side of the palace. The roof of the library on the north terrace is being repaired.

Professor Reginald Stuart Poole will retire from his post as keeper of the department of Coins and Medals in the British Museum in the ensuing autumn, after a period of service of over forty years, twenty-two of which he has been the head of the department. During his tenure of office Mr. Poole has edited the official catalogues of Greek, Roman, and Oriental coins, of which thirty-one volumes have been published by the trustees of the British Museum. He is also an honorary secretary of the Egypt Exploration Fund. It is understood that Mr. Poole will continue to hold the professorship of archaeology at University College.

The Acton School Board discussed at great length at their last meeting a claim for £39 10s. made by Mr. E. Monson, their architect for the Beaumont Park schools, being commission at the rate of three per cent. upon work to the amount of £1,316 originally included in the contract, but omitted in execution. The account was eventually passed.

COMPETITIONS.

MANCHESTER.—The proposal of the committee of the Manchester Infirmary for the extension of the building—a proposal which, in one form or another, has been under discussion for some months—has now been definitely rejected. Some of the leading medical men wish to have a branch hospital at Stanley-grove, where it would be convenient for the professors and students at Owens College. The objections to this have been that it would entail too much administrative expense, and that there is plenty of land surrounding the present building, upon which wings could be erected. The trustees have been called upon to vote in the matter, and they have decided, by 414 to 284, against any extension on the present site, although, as we announced three weeks since, a sub-committee recommended the adoption of the scheme prepared in competition by Mr. Alexander Graham, F.S.A., of Regent-street, S.W., which showed two new wings, an operating theatre, and the enlargement of the nurses' house, and were estimated to cost £40,720.

SOUTHPORT.—In a limited competition among thirteen firms of architects for a new infirmary to commemorate the centenary of the town, the committee, acting on the advice of a professional assessor, have adopted the plans sent in by Mr. C. Sydney Ingham, of Manchester and Southport. The work is to commence at once, and it is to be hoped that the foundation stone may be laid towards the end of October. The style is Free Flemish, the materials are stock bricks and stone dressings, and the cost will be £13,000, exclusive of site.

ARCHITECTURAL & ARCHAEOLOGICAL SOCIETIES.

YORK MASTER BUILDERS' ASSOCIATION.—The annual excursion of this association took place on Wednesday week, when Grantham and Belvoir Castle were visited. To the number of 35 the party left York by rail in special saloon, arriving at Grantham shortly after nine. Breakfast was partaken of at an hotel, and subsequently the members proceeded in conveyances to Belvoir Castle. Here they were shown through the interior of the castle, the plate, jewelry, &c., while the grounds, the stables, and the kennels were also viewed. Journeying back to Grantham, dinner was served at the hotel, after which the places of interest in the town were visited.

The 44th annual meeting of the Somersetshire Archaeological Society was opened at Wellington on Tuesday. An address, chiefly dealing with pre-historic remains, was given by the new president, Mr. W. A. Sanford, and visits were afterwards paid to the parish churches of Wellington, Bradford, and West Buckland, and to Werbestone House.

A discussion in the town council of Hull as to the necessity of framing a more stringent code of building regulations has been followed up by some correspondence on the subject in the local newspapers. Well-defined frontage lines and some powers over the height of buildings are the chief requirements, together with a proviso that approval of a plan shall be invalid if the proposed building is not carried out within some definite period—say, two years.

The foundation stone of a bridge across the river Skell, between Ripon and Bondgate, was laid on Friday. The bridge replaces a narrow stone one of high gradients, and will be of iron girders with stone piers. The bridge is to be built to the plan of Mr. Henry Dearden, late city surveyor, who has since been appointed borough surveyor of Batley, the work now being superintended by the present city engineer, Mr. T. Kidd. The contractors are, Messrs. DeBergue and Co., for iron work, £920; Mr. W. F. M. Blackburn, for stone work, £595; new walks, kerbing, channelling, and asphalt road-way to be carried out by the corporation, £171, total, £1,686.

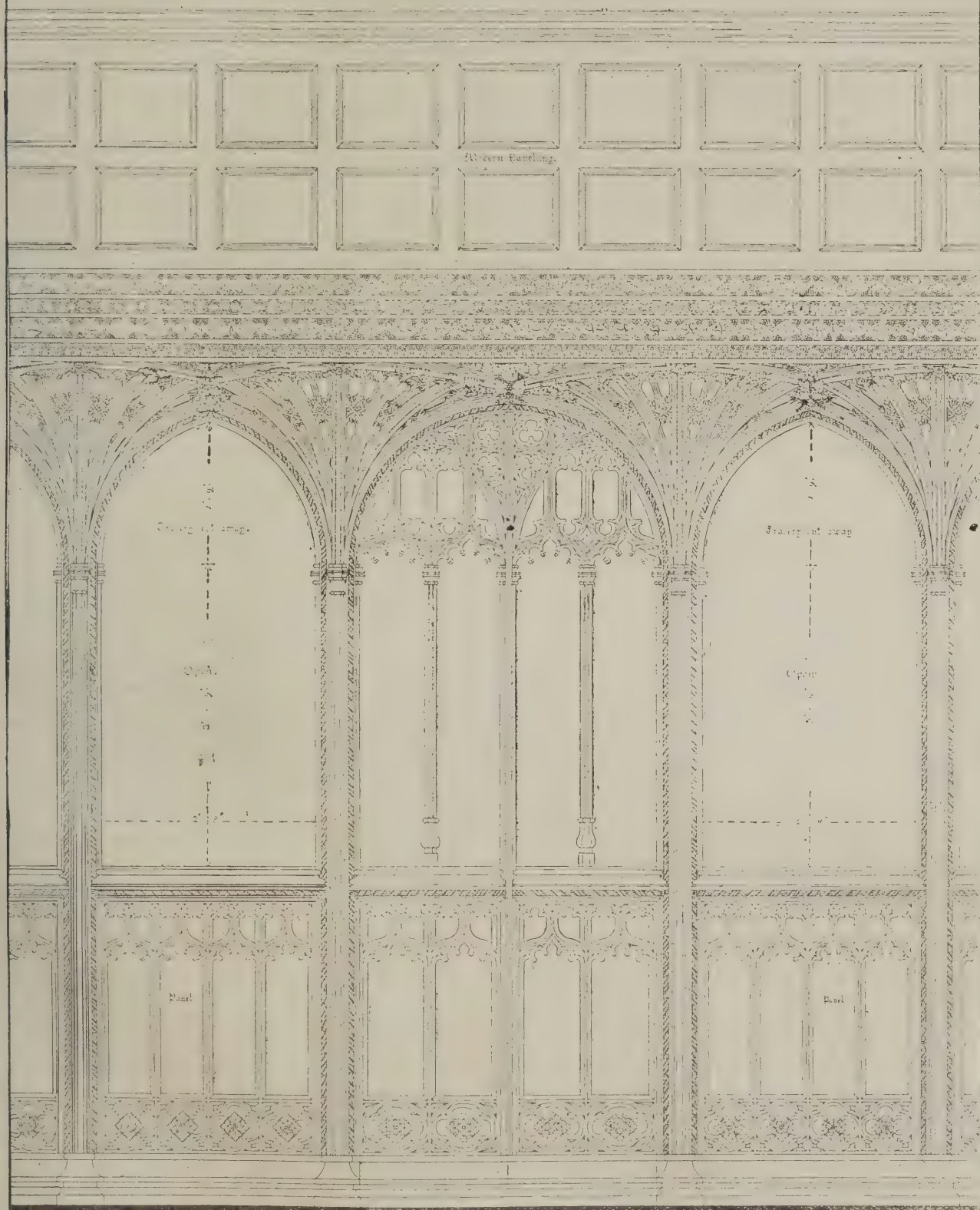
A new Wesleyan chapel at Whitewell Bottom, Rawtenstall, was opened on Tuesday week. The cost of the new building and internal alterations in the old building, which is to be used as a school, is £1,600. The nave is 50ft. by 30ft. There is a small chancel to accommodate the choir, the minister's vestry and organ-chamber being arranged to the right and left respectively. The style is Early Gothic. At the prominent angle there is an octagonal spirelet to the height of 56ft., terminating in an open flèche in Stettin oak. The chapel is erected in stone, and the internal woodwork is of pitchpine. The architects were Messrs. William Waddington and Son, Manchester and Burnley, and the contractors were Messrs. Moore Brothers, of Rawtenstall.



ARCHITECTURAL ASSOCIATION EXCURSION 1892
SOMERSETSHIRE.



St. Michaels · Minehead · Somersetshire ·
· Portion of Rood Screen ·



Seven Bays on this side including bays from A Aisle.

Elevation
Looking East.

Three Bays on this Side.

Plan through Open part

Plan through Panels

Boarding

Door.

Scale of

1 Foot.

WAYSIDE NOTES.

OUR English watering-places should do well this year. The cholera scare will keep thousands of persons at home who would be off to foreign parts. Scotland, they say, too, is wonderfully patronised this season, and North Wales doubtless follows suit. It may be that the *canards* respecting the sanitary condition of our seaside resorts come from abroad; anyhow, it is astonishing how numerous they have been this year. Here there has been fever, there small-pox, and the drainage of this and that watering-place is defective. More or less of this sort of thing is to be noticed every season; but I seem to have observed more complaints than usual. It may be that certain individuals have a habit of looking with hypercritical eye upon the sanitary arrangements of each new town with which they make acquaintance. I refrain from suggesting that inspectors of nuisances, when holiday-making, are wont to spend their leisure hours in discovering defects of drainage, &c., or a higher rate of mortality from certain infectious complaints than they deem compatible with a healthy town.

Yet there may be something in this; for we may observe that every seaside place has its turn, just as though some individual or individuals resorted to a new field for enterprise year by year, and duly addressed a communication to his or their particular "morning." Brighton long ago had its day, and was reported in such a state as would lead one to expect direful results to man and beast, yet the town remains with its enviably low death-rate. Worthing is now having a turn, and correspondent "Sanitas" has discovered some dreadful things. Among them may be a mare's nest. Margate was once very favourite game with these discoverers of insanitation. Someone manufactured an epidemic of smallpox at Yarmouth this year, and I was glad to see that the mayor of the town denied the existence of any cases of the disease. Smallpox is rather a cheap line with mongers of this kind of news: a little rumour makes a great scare. During the strawberry season it was reported that smallpox was raging among the gipsy fruit-pickers in the Cray valley, and that tons of strawberries had been condemned. The latter may be true; but most probably the "epidemic" consisted of one or two cases promptly hurried off to the floating hospital at Purfleet. Yet I know that many near residents shunned the Cray district for months, as though it were a plague-spot.

The *Times* has recently concluded a series of articles dealing with the question of the water-supply of London. The writer makes out no more cheerful a case than others have done. So great has been the increase in consumption during the past few years that we are stated to be within reasonable distance of a water famine. Add to this the fact that about one-half of the present supply is drawn from the Thames and the Lea, and the outlook is not encouraging. The only hopeful feature about the water supply question is the great and continual increase in consumption. "More water, more health," would be a very true aphorism. The water, however, should be pure, and not highly-diluted sewage, as we are frequently informed by statistical statements to be the case with regard to much London water. The conclusion of the writer with regard to the question of new sources of supply is that London must go far afield. New supplies are only to be gained near at hand by seriously injuring the population of the districts whence the water is procured. To drain away all the water of a certain area of country in order to supply a distant city is manifestly unfair. More water, it is said, may be procured from the chalk hills. In Kent there is, however, at the present time, a considerable drain upon the supplies. As an example of the difference the institution of a pumping-station may make, there is at the south end of the village of Orpington a deep hollow, which in former days was periodically full of spring-water. Since, however, the erection of the pumping-engines, that may be noticed below the steep embankment of the South-Eastern Railway, the hollow has been as dry as a bone, although fully half a mile from the pumps.

Grand old Carshalton Park is to be parcelled out at last. On Monday a first portion of the

estate was sold by auction, 10 acres realising £3,869. The entertaining auctioneer, I am told, made many humorous references to the effect that the deer in the park constituted an attraction worth an additional £5 a year of anyone's money, while other benefits and advantages were worth a like sum; but the real gain would be residence near so charming a village, if indeed Carshalton with its Park turned into a building estate, and its old church restored out of all knowledge, will be anything like Carshalton of old.

We have so little Saxon work left that it is always of great interest to hear of any reputed discovery of pre-Norman architecture. At St. Augustine's Church, East Langdon, Dover, which was reopened on Friday last after complete restoration, it is said that two Saxon windows have been discovered, and a date of 700 B.C.—the supposed date of the older part of the church—has been assigned to the work. The windows had been blocked up, and were discovered in the course of taking down the old gallery. If these features are of genuine Saxon workmanship, the building should become noteworthy. Of what Saxon architecture remains in this country, Kent possesses—or has hitherto been supposed to possess—little or none. Bloxham mentions the substructure of the south wall of Lyminge Church as containing vestiges of Anglo-Saxon architecture, and as having been personally visited and examined. Among other buildings reputed to contain vestiges of this style of architecture this authority puts Swanscombe Church. I know the latter, but the traces of the Saxon method of building are very meagre. If St. Augustine's, East Langdon, does not possess anything more plainly Saxon than this, there will be little to go out of the way to see. If, on the other hand, there be something like Sompington, Sussex, the discovery is remarkable. On, or near, the coast of Kent, one would be surprised to find even a trace of Saxon architecture, it being presumed that the rebuilding in Norman times would be very general and thorough.

The best club—so far as instruction is concerned—for juniors is where there are plenty of seniors. Shall the blind lead the blind? I have some sympathy, though, with your correspondent's aspirations. The Architectural Association is growing more and more academical and less social; young men may feel the want of a new mutual aid society. But under eighteen! Why, there would have to be a matron and nurses!

Your Glasgow architect seems to have solved the problem—"Architecture—a profession or an art?"—by designating architecture a "business." His championing the cause of Scotch pupils is a praiseworthy act, seeing that the pupil as an individual is little championed, whilst we all write vaguely of "students" in the *bu'k*. Architects' pupils in Scotland have certainly not the advantages of London students; but then neither have the provincial pupils in England these advantages. Still, the architectural student in Scotland is thrown more on his own resources. Other things being equal, this should produce a self-reliant youth—one who digs out for himself—quite the young man for me. The desirability of careful training, however, has been fully demonstrated by this time, and the Scotch pupils, if they themselves feel the drawbacks referred to by your correspondent at Glasgow—should endeavour to have the want of educational facilities supplied. Glasgow being the second city of the British Isles, and a city of which the British nation may well be proud, ought not to lack educational facilities of any kind. This is surely a matter for Scotch architects who are something more than business hunters and practitioners.

GOTH.

Preparations are being made for the erection at Eccles of new day and Sunday schools for St. Andrew's Church. The cost will be about £6,000. Mr. H. Lord, of Manchester, is the architect, and Messrs. William Brown and Sons the builders.

A stained-glass window, representing the commissions given to St. Peter, has been placed in one of the side lights of the chancel of Tysoe Church, Warwickshire. It has been executed by Messrs. Lavers, Barrand, and Westlake, of London, the artists of all the other stained-glass windows in the same church.

COLLAPSE OF FLOORING AT A BAKERY.

AN accident of an alarming nature is reported in the Scotch papers as having occurred on Saturday in M'Neill-street, Glasgow. A bakery was being built as an addition to the United Co-operative Baking Society's premises, which partially collapsed, fortunately without incurring loss of life, though involving serious destruction to property and injury to a workman. To insure fireproof construction, the floors were formed of arches of white enamelled bricks, and sprung from iron beams fixed to the walls, tied together by iron tie-rods, which are continued through the length of each floor. One of these in the third story snapped, when the gable yielding to the pressure of the arches bulged out, causing the arches to fall crashing through the floors beneath. Men were engaged laying cement on the floor, and hearing the loud report caused by the snapping of the tie-rod rushed to the staircase just in time to avoid being precipitated. A man named Brown jumped from a window and broke his left-leg. The bakery is an ornate brick structure of four stories and attics, with a frontage to M'Neill-street, a portion of this building has been in use some years, and the addition was made at the north end as a continuation about 60ft. long. The contractors are Messrs. Bell, Hornsby, and Co.

CHIPS.

Works in connection with the erection of the Central Electric Lighting Station at Temple Back, Bristol, which were stopped for a month owing to the recent builders' strike in that city, have been recommenced this week. Mr. H. J. Williams, of Bristol, is the architect. A Local Government Board inquiry was held at the Council House, Bristol, on Friday, before Mr. Rienzi Walton, inspector, into an application from the city council for sanction to borrow £66,000 to carry out the lighting scheme.

A small Wesleyan chapel is being built at Gaws-worth, near Macclesfield, by Mr. John Clayton. Services have been held in the surrounding farm-houses for upwards of 100 years.

The town council of Stafford last week voted a gratuity of £50 to Mr. Blackshaw, the borough surveyor, for his services in connection with the public baths.

A large block of buildings is in course of erection for a corner site at St. Anne's-on-Sea from plans by Mr. Herbert Wade, of that town, at a cost of over £5,000. The premises will consist of shops on the ground floor, and on the floors above, suites of offices and a public hall, seated for 200 people, and having two exits. At the angle of the two thoroughfares will be a clock tower. The frontages of the building will be of Accrington brick with stone dressings, and the block throughout will be lighted by electricity.

The London and South-Western Railway Company, which on November 1 next takes possession of the Southampton Docks, recently purchased by it for the sum of £1,350,000, last week applied to the Southampton Corporation for a grant of 20 acres of mudlands south of the new Empress Dock, for a proposed new dock and quay-wall, which will be 1,800ft. long. This will involve a further outlay of £250,000. It is understood that the Inman Steamship Company are prepared to take advantage of this new accommodation as soon as it can be provided. The corporation have granted the land applied for on the condition that a steamship company make it their headquarters for a period of not less than ten years.

The foundation stone of a R.C. church was laid at Bideford last week. The church will be cruciform on plan, and built of local stone with a slated roof. It will be 58ft. in length by 22ft. across the nave. Mr. Lethbridge, of Plymouth, is the architect.

On Tuesday week the new infant school in Talbot-street, Rugeley, was formally opened by the Bishop of Lichfield. The new building, which is built of brick with stone dressings, consists of a large room 50ft. by 20ft., a classroom 20ft. by 20ft., and a cloak-room. The school will accommodate 175 infants, and has cost over £1,100, the architect being Mr. John Greensill, of Great Wyrley, and the builder Mr. Thomas Mason, of Rugeley and Hednesford.

The Bristol town council have approved of plans prepared by the city surveyor for an infectious diseases hospital to be built on a site of 13 acres at the Novers, Bedminster. The buildings will eventually consist of 14 wards containing 220 beds, and are expected to cost in all £32,500; but at present only half the scheme, consisting of seven ward blocks, and two administrative blocks are to be carried out.

PRICES.*—XLIII.

(All Prices Include Profit, and have had all Trade Discounts taken off.)

IRONMONGER (continued).

HOBBS' LOCKS.

DOOR FURNITURE, fixed—		£	s.	d.
No. 216 H per set	each	0	12	0
309 H ditto	ditto	0	7	0
109 H ditto	ditto	0	15	6
80 H ditto	ditto	0	4	3
60 H ditto	ditto	0	3	9
60 H ditto	ditto	0	3	4
312 H ditto	ditto	0	7	9
115 H ditto porcelain	ditto	0	15	0
112 H ditto	ditto	0	7	3
113 H ditto	ditto	0	15	0

80 H 2½ cushion pattern ebony or oak per set	ditto	0	4	6
2½ ditto ditto	ditto	0	6	0
60 H 2½ round knobs, ebony or oak	ditto	0	3	6
2½ ditto ditto	ditto	0	4	0
2½ ditto ditto	ditto	0	4	6
2½ Salisbury pattern, ivory or oak	ditto	0	7	6
2½ ditto ditto	ditto	0	8	6
90 H 2½ stag pattern	ditto	0	7	3
2½ ditto ditto	ditto	0	8	3

Lignum vitae, 1s. extra per set. Cocus wood, 6d. ditto.				
No. 180 H 2½ fine carved Burlington pattern	ditto	0	9	3

All the above 1s. per set extra if with metal roses bronzed or bright lacquered.

No. 322 H 2½ real buffalo horn, plain	each	0	6	6
2½ ditto ditto	ditto	0	7	3
2½ ditto ditto	ditto	0	8	3
525 H 2½ inlaid with pearl, very choice	ditto	0	8	6
2½ ditto ditto	ditto	0	9	3
2½ ditto ditto	ditto	0	10	0
65 H pointed crystal	ditto	0	16	0
Amber	ditto	0	18	6
67 H flat top	ditto	0	11	0
Flat top amber	ditto	0	14	3

62 H strong round brass knobs with solid necks, cast roses and escutcheons	ditto	0	3	3
2½ ditto ditto	ditto	0	3	9
2½ ditto ditto	ditto	0	4	6
2½ ditto ditto	ditto	0	5	0
220 H 2½ solid milled edges, round brass knobs	ditto	0	4	6
2½ ditto ditto	ditto	0	6	0

225 H 2½ octagon flat top, brass or bronze knobs	ditto	0	6	3
2½ ditto ditto	ditto	0	7	3
2½ ditto ditto	ditto	0	8	3
3 ditto ditto	ditto	0	9	6

Furniture with slotted steel spindles 6d. per set less than those with double spindles.

FINGER PLATES, fixed—		£	s.	d.
No. 52 H with rosettes, ebony or oak, 10 by 2½	each	0	1	9
Ditto long, 12 by 2½	ditto	0	2	0
Ditto special long, 18 by 2½	ditto	0	2	9
Ditto ditto 24 by 2½	ditto	0	3	6

70 H ditto, with rosettes, as 70 H Salisbury pattern knobs, 14 by 3	ditto	0	4	0
152 H 10 by 3, Cairn's pattern, ebony	ditto	0	2	6
60 H 14 by 3, Burlington's carved ebony	ditto	0	11	9
525 H Buffalo horn, pearl rosettes, short size	ditto	0	5	6
Ditto long	ditto	0	5	9
Ditto with plain rosettes, 524 H less	ditto	0	1	6

PORCELAIN, best fine quality, fixed—		£	s.	d.
No. 110 H Guilloche pattern	ditto	0	4	6
111 H Zigzag ditto	ditto	0	3	6
112 H Laurel ditto	ditto	0	3	6
113 H Rich black ditto	ditto	0	7	3
101 H white and two lines	ditto	0	2	0
103 H Black and ditto	ditto	0	2	0
104 H Ivory and ditto	ditto	0	2	6

COMMON POTTERY CHINA FINGER PLATES, fixed—		£	s.	d.
No. 40 H plain white	each	0	0	6
42 H gold lines	ditto	0	1	5
41 H black	ditto	0	0	9
43 H ditto two gold lines	ditto	0	1	7
Two-bolt mortise sets, white	ditto	0	1	6
Ditto ditto black	ditto	0	1	8
Ditto ditto extra for two gold lines	ditto	0	1	5

TUCKER AND REEVES' LOCKS, fixed—

PREMIER 2-bolt Rim Locks—		£	s.	d.
5in. and 2 keyed, machine-made	each	0	14	6
6 ditto ditto	ditto	0	15	6
7 ditto ditto	ditto	0	18	0
8 ditto ditto	ditto	1	5	0
9 ditto hand-made	ditto	1	6	6
6 ditto ditto	ditto	1	8	6
7 ditto ditto	ditto	1	10	6
8 ditto ditto	ditto	1	14	6

If not Premier, 1s. 6d. per lock less.

RIM SPRING and three-bolt locks for doors, fixed—		£	s.	d.
6in. 2-keyed, 5 and 6 lever	each	1	11	0
7 ditto ditto	ditto	1	15	0
8 ditto ditto	ditto	2	0	0
9 ditto ditto	ditto	2	7	0
10 ditto ditto	ditto	2	12	6

PREMIER mortise two-bolt locks, fixed—		£	s.	d.
6in. 2-keyed	ditto	0	18	6
7 ditto	ditto	1	0	6
6 ditto hand-made	ditto	1	8	6
7 ditto ditto	ditto	1	11	6

Full rebated locks 6s. each extra and upwards. Half rebated locks extra, 2s. and upwards. If with only one key per lock, less 2s.

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Mortise locks made to differ from each other, and with a master key to pass, the whole charged at 2s. 3d. each extra. Master keys 2s. 6d. each. If without the Premier latch 2s. 6d. per lock less.

MORTISE NIGHT LATCHES for front doors, fixed—		£	s.	d.
3 and 4in., with 2 small keys, hand made	each	1	1	0
5in. ditto	ditto	1	3	0

RIM LATCHES for front doors, fixed—		£	s.	d.
4in. 2 keyed 3-slide, machine made	ditto	0	7	6
4 ditto 5	ditto	0	9	9
5 ditto 5	ditto	0	12	0
6 ditto 6	ditto	0	18	0
6 ditto 6 hand made	ditto	0	19	0
6 ditto 6	ditto	0	4	0

If to lock, extra

MORTISE SPRING LOCKS for front doors, fixed—		£	s.	d.
3 to 4in., with 2 small keys, 5 and 6 lever	ditto	1	10	0
5in. ditto	ditto	1	11	0
6 ditto	ditto	1	13	0
7 ditto	ditto	1	15	6

FLUSH LATCHES for street doors, fixed—		£	s.	d.
4in. 2-keyed 3-slide	ditto	0	9	6
4 ditto 5	ditto	0	11	9
5 ditto 5	ditto	0	14	6
5 ditto 6 home made	ditto	1	1	0
6 ditto 6	ditto	1	2	6
If to lock, extra	ditto	0	4	0

PREMIER LATCHES, fixed—		£	s.	d.
4in. mortise	ditto	0	9	9
6 ditto	ditto	0	10	6
3 run	ditto	0	7	9
4 ditto	ditto	0	8	6
5 ditto	ditto	0	9	3
4 pulpit latch, including furniture	ditto	0	6	3

With the mortise and rim latches a small knob is included in the price, for the purpose of locking the bolt out.

MORTISE DEAD LOCKS, fixed—		£	s.	d.
5in. hand made, with 2 keys	each	0	18	0
4 ditto ditto	ditto	0	18	0
5 ditto ditto	ditto	1	0	0
6 ditto ditto	ditto	1	2	0
7 ditto ditto	ditto	1	4	0
8 ditto ditto	ditto	1	10	0
9 ditto ditto	ditto	1	16	0

RIM DEAD LOCKS, fixed—		£	s.	d.
4in. hand made, with 2 keys	ditto	0	16	0
5 ditto ditto	ditto	0	16	0
6 ditto ditto	ditto	0	17	0
7 ditto ditto	ditto	0	19	6
8 ditto ditto	ditto	1	3	0
9 ditto ditto	ditto	1	8	0
10 ditto ditto	ditto	1	16	0
12 ditto ditto	ditto	2	7	0
Two-sided, ditto, to 6in., extra	ditto	0	2	0
Above 6in., and to 10in., extra	ditto	0	4	0

NEW SAFEGUARD Cabinet Locks, fixed—		£	s.	d.
2 by 1in., 2 keys, till or draw locks	ditto	0	5	9
2 by 2½ ditto ditto	ditto	0	4	9
2 by 2½ ditto ditto	ditto	0	4	9
2 by 3 ditto ditto	ditto	0	4	9
If extra strong, per lock extra	ditto	0	1	0
2by1 2 keyed hand made	ditto	0	8	9
2½ ditto ditto	ditto	0	7	9
2½ ditto ditto	ditto	0	7	9
3 ditto ditto	ditto	0	7	9
2by1 2 keyed straight cupboard locks	ditto	0	6	3
2 ditto ditto	ditto	0	5	3
2½ ditto ditto	ditto	0	5	3
3 ditto ditto	ditto	0	5	3
3½ ditto ditto	ditto	0	6	0
4 ditto ditto	ditto	0	7	0
If extra strong padlocks, extra	ditto	0	1	0
2by1 2-keyed hand made cupboard locks	ditto	0	8	3
2 ditto ditto	ditto	0	8	3
2½ ditto ditto	ditto	0	8	3
3 ditto ditto	ditto	0	8	3
3½ ditto ditto	ditto	0	10	3
4 ditto ditto	ditto	0	10	3
2by1 2 keyed cut cupboard locks	ditto	0	5	9
3 ditto ditto	ditto	0	4	9
3½ ditto ditto	ditto	0	5	6
4 ditto ditto	ditto	0	6	6
2by1 ditto ditto hand made	ditto	0	8	9
3 ditto ditto	ditto	0	7	9
3½ ditto ditto	ditto	0	8	3
4 ditto ditto	ditto	0	9	9
If extra strong padlocks, extra	ditto	0	1	0

TWO-BOLT WARDROBE LOCKS, fixed—		£	s.	d.
3½in. 2 keyed hand made	ditto	0	11	9
4 ditto ditto	ditto	0	12	9

CHEST, desk, pedestal, and linkplate cupboard locks—		£	s.	d.
2by1 2 keyed	ditto	0	6	9
2½ ditto	ditto	0	5	6
3 ditto	ditto	0	6	0
3½ ditto	ditto	0	6	6
4 ditto	ditto	0	7	3

2by1 2 keyed hand made		£	s.	d.
2½ ditto	ditto	0	10	3
3 ditto	ditto	0	9	3
3½ ditto	ditto	0	10	3
4 ditto	ditto	0	11	3
4½ ditto	ditto	0	12	9

If extra strong padlock, extra

Escutcheon lock	ditto	1	1	0
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3½in. 6 lever sliding door cupboard lock, machine made	ditto	0	11	6
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Locks made to differ, but with a master key to pass, are charged at 1s. 9d. per lock extra.

Cabinet locks with only one key are 6d. per lock less than 2 keyed.

All Cabinet locks made on suite are charged at 3d. per lock more than 1 keyed.

PATENT HOLDFAST LOCKS, fixed—till or drawer to spring—		£	s.	d.
2½in. 2 keyed machine made	each	0	10	3
3 ditto ditto	ditto	0	10	3

STRAIGHT CUPBOARD LOCKS to spring, fixed—		£	s.	d.
2½in. 2 keyed machine made	ditto	0	10	0
3 ditto ditto	ditto	0	10	9
3½ ditto ditto	ditto	0	12	3

CUT CUPBOARD locks to spring—		£	s.	d.
3in. 2 keyed, machine made	ditto	0	10	3
2½ ditto ditto	ditto	0	11	3

PATENT Hold-Fast Self-Acting Spring Locks, unfixed—

Pillar and wall letter box locks, 3 keys	each	1	1	0
Ditto ditto 4	ditto	1	4	0
Ditto ditto 5	ditto	1	7	0
Ditto ditto 6	ditto	1	9	6
Ditto ditto 7	ditto	1	12	6
Ditto ditto 8	ditto	1	15	6
3in. 2 keyed drawer locks	ditto	0	10	6
3in. 2 ditto cut cupboard locks	ditto	0	10	6
3½ ditto ditto	ditto	0	11	6
3 2 keyed straight ditto	ditto	0	11	0
3½ ditto ditto	ditto	0	12	0

PATENT Iron Holdfast padlocks—		£	s.	d.
2in. 2 keyed	ditto	0	4	9
2½ ditto	ditto	0	4	9
3 ditto	ditto	0	5	3
3½ ditto	ditto	0	5	9

BRASS ditto—		£	s.	d.
1in. 2 keyed machine made	ditto	0	4	9
1½ ditto ditto	ditto	0	4	0
1½ ditto ditto	ditto	0	4	3
1½ ditto ditto	ditto	0	4	9
2 ditto ditto	ditto	0	5	3
2½ ditto ditto	ditto	0	5	9
2½ ditto ditto	ditto	0	7	0
3 ditto ditto	ditto	0	8	9
3½ ditto ditto	ditto	0	11	0
1 ditto hand made	ditto	0	9	3
1½ ditto ditto	ditto	0	8	9
1½ ditto ditto	ditto	0	9	3
1½ ditto ditto	ditto	0	9	9
2 ditto ditto	ditto	0	10	6

Rim Locks, 2 brass bolts, No. 36, fixed—	£ s. d.
6in. 1 nickel-plated key and 2 levers	each 0 4 8
7 ditto ditto	ditto 0 5 6
KAYE'S Push and Pull Locks, fixed—	
2-bolt mortise lock, iron lock bolts and adjustable plate 4in. to spindle of lock, 2 levers	ditto 0 5 6
Ditto ditto 4 levers	ditto 0 6 6
Ditto with brass bolts and adjustable plates 5in. to spindle	ditto 0 7 0
Ditto ditto 4 levers	ditto 0 8 6
Two-bolt very strong brass mortise lock, 4 lever, 6in. to spindle, and highly finished	ditto 0 10 6
Ditto ditto 6 levers	ditto 0 12 6
Large sized brass mortise lock, 5 lever, with strong brass adjustable striking plate	ditto 0 17 6
Ditto ditto 6 levers	ditto 1 0 0
Brass rebated dead mortise lock, with 4 levers	ditto 0 11 6
Ditto ditto 6 levers	ditto 0 12 6
Brass mortise latch, 5in. to spindle	ditto 0 5 6
Adjustable striking plate for large lock	ditto 0 2 10
Ditto for small ditto	ditto 0 2 4
Ditto for latch	ditto 0 1 4
Furniture per set, fixed	0 3 0
Spring cupboard catches	2s. to 3s.
Strong bar handles, with polished brass plates, including latch and adjustable striking plates, for public entrance and other doors which fasten and open automatically by the handle, unisex ..	each 2 2 0
Ditto small size	ditto 1 13 0
Master key locks in suite to differ, extra ..	ditto 0 2 0

VERITT'S Patent dead-weight locks, fixed—	
6in. mortise lock, iron case, 1 lever	each 0 6 0
Ditto ditto 2 ditto	ditto 0 7 0
Ditto ditto 3 ditto	ditto 0 8 0
7 ditto ditto 1 ditto	ditto 0 7 0
Ditto ditto 2 ditto	ditto 0 8 0
Ditto ditto 3 ditto	ditto 0 9 0
Ditto ditto 4 ditto	ditto 0 10 0
6in. brass-cased	ditto 0 12 0
Ditto ditto 2 ditto	ditto 0 13 0
Ditto ditto 3 ditto	ditto 0 14 0
Ditto ditto 4 ditto	ditto 0 16 0
7 ditto ditto 1 ditto	ditto 0 14 0
Ditto ditto 2 ditto	ditto 0 15 0
Ditto ditto 3 ditto	ditto 0 16 0
Ditto ditto 4 ditto	ditto 0 18 0
6in. rim lock with iron case, 1 ditto	ditto 0 3 6
Ditto ditto 2 ditto	ditto 0 4 0
Ditto ditto 3 ditto	ditto 0 4 6
Ditto ditto 4 ditto	ditto 0 5 6
8 ditto ditto 1 ditto	ditto 0 5 6
Ditto ditto 2 ditto	ditto 0 6 0
Ditto ditto 3 ditto	ditto 0 7 0
Ditto ditto 4 ditto	ditto 0 8 0
6in. ditto with brass case, 1 ditto	ditto 0 9 0
Ditto ditto 2 ditto	ditto 0 10 0
Ditto ditto 3 ditto	ditto 0 11 0
Ditto ditto 4 ditto	ditto 0 12 0
8 ditto ditto 1 ditto	ditto 0 15 0
Ditto ditto 2 ditto	ditto 0 17 0
Ditto ditto 3 ditto	ditto 0 19 0
Ditto ditto 4 ditto	ditto 1 1 0
All furniture extra.	

HILL'S LOCKS, fixed—	
6in. patent reversible rim lock, 2 levers and two iron bolts	each 0 3 8
Ditto with two brass bolts	ditto 0 4 3
6in. brass bushed, solid brass wards, Scotch spring	ditto 0 3 9
7in. ditto ditto	ditto 0 4 6
8in. ditto ditto	ditto 0 5 0
6in. brass, two-bolt ward	ditto 0 7 0
Ditto with two levers	ditto 0 9 0
Ditto reeded and polished	ditto 0 11 3
Ditto 4 lever	ditto 0 11 6
Ditto ditto reeded and polished	ditto 0 13 6
3in. reversible upright rim locks	ditto 0 2 10
3 ditto 2 levers and 2 brass bolts ..	ditto 0 4 0
Ditto, all polished brass	ditto 0 8 6
3in. upright mortise locks	ditto 0 8 6
3 ditto ditto	ditto 0 8 9
Half rebating, each extra	ditto 0 1 9
6in. reversible mortise locks, with 2 levers ..	ditto 0 7 6
7 ditto ditto	ditto 0 9 9
6 ditto with 4 levers and 2 iron bolts	ditto 0 9 3
6 ditto and 2 brass bolts	ditto 0 10 6
7 ditto ditto	ditto 0 11 9
6 ditto all brass	ditto 0 12 0

REVERSIBLE Centrebit Mortise Locks—	
6in. 1 lever 2 iron bolts	ditto 0 5 6
ditto 2 brass bolts	ditto 0 6 6
3 lever ditto	ditto 0 7 6
ditto half rebated	ditto 0 9 0
2-lever double-handed roller bolt mortise locks, with gunmetal roller and steel follower	ditto 0 9 3
7 ditto ditto	ditto 0 11 0
If with master key, extra	ditto 0 1 3

YALE LOCKS, fixed—	
Rim or drawback	each 23 0 to 35 0
Ditto ditto	ditto 10 0 to 16 0
Mortise, 2 side, dead	ditto 16 0 to 35 0
Ditto ditto locking latches	ditto 8 6 to 14 6
Night latches	from 9 6
Mortise locks, 2 bolt	ditto 28 0 to 39 0
2in. box or desk lock	each 0 5 6
3 ditto ditto	ditto 0 7 0
4 ditto ditto	ditto 0 11 6
2 ditto ditto	ditto 0 5 0
3 ditto	ditto 0 6 0
2 cut cupboard ditto	ditto 0 5 9
4 ditto	ditto 0 6 6
4 ditto	ditto 0 8 0
3 straight ditto ditto	ditto 0 5 9
3 ditto ditto	ditto 0 6 3
4 ditto ditto	ditto 0 7 9

BROMHEAD-DOUGLAS springless locks, fixed—	
6in. rim 4 lever with brass bolts	each 0 10 6
7 ditto ditto	ditto 0 11 6
6 ditto 2 lever ditto	ditto 0 8 0
7 ditto ditto	ditto 0 9 0
6in. mortise 4 lever and brass bolts	ditto 0 12 6
Ditto 2 ditto ditto	ditto 0 10 6
Ditto 3 ditto ditto	ditto 0 9 6
5in. mortise night latch, 2 keys and brass bolts	ditto 0 13 6

OSBORNE HOUSE.

THE important new addition to Her Majesty the Queen's marine residence at Osborne, Isle of Wight, is now virtually completed, but there is still a month's work for the decorators in the Durbar room. The design of Mr. J. R. Mann, A.M.I.C.E., surveyor of works to the Osborne Estate, was approved over two years ago, April 1890, and the work was immediately commenced by Messrs. W. Cubitt and Co., Gray's Inn-road, London, who have carried out all the work with the exception of the ornamentation of the Indian room, to be known in future as the Durbar room, which is being done by Messrs. Geo. Jackson and Sons, Rathbone-place, London. The carcass was completed in eight months, and the entire block, with the above exception, in sixteen months. During the several occasions the Court was in residence the work was stopped, thus delaying the work a good deal.

The extreme dimensions are 120ft. long, 43ft. wide, and 45ft. high. The central 70ft. projects nearly 2ft. before, and is also higher than the ends. It runs parallel to the building joining the main and household wings, which has a colonnade on the first floor. A long connecting corridor was necessary in order to obtain a symmetrical elevation. Junction is made with the nearly square pavilion building (that occupied by the Queen and other members of the Royal family) at the corner to the left of the entrance portico, near the foot of the flag tower. The new design is, of course, in harmony with the older buildings in the Italian Renaissance style, rustications and pilasters being the main features. The new building is only two-storied, the older blocks being, without exception, of three.

The building returns to the pavilion only wide enough for a 10ft. corridor; at the terrace or lower end a large serving-room is fitted up with the necessary appurtenances, hot closets, &c. Two doors lead from this one across the landing of the principal stairs into the Durbar Room; the other on to the serving-stairs from the basement landing, and by a second door into the Durbar Room. The Durbar Room, with its large bay window, is on the lawn side of the building, the main corridor being on the quadrangle side. Ahead of the main corridor, and at right angles to it, a passage returns leading into the hall of the front entrance. On the right of the entrance a flight of stairs lead to the floor above; on the left there is a small waiting-room.

The space on the one-pair floor above the Durbar Room (60 by 30ft.) is divided by half-brick partitions into three commodious rooms. The three casements of the centre room communicate with the paved roof of the bay window. At each end of the building there are two bedrooms.

The main staircase is lit by a lantern light; the return passages are also partially lit by borrowed lights in the framed roof. Owing to the different levels of the ceilings of the ground floor, there are three floor-lines to the first floor, necessitating two flights of steps in the main corridor.

Windows with three-quarter Corinthian columns on the ground floor, with a level block cornice, are a novelty in the design, there being so such in the older building. The enriched Ionic caps to the ground-floor pilasters seem to have been suggested by Michael Angelo's design at the Roman College. The caps to the Ionic pilasters above are not enriched. The centre portion has a massive upper block cornice enriched with egg-and-tongue, the plain frieze being cushioned. The cornice below is broken over the pilasters, with cushioned frieze only at the break; it is, together with the upper cornice of the ends, enriched with dentils. The entire building is surmounted by a massive balustrade. Above the dados of the lower portions vases are fixed. The front entrance has a rusticated impost, a voussoir to the circular head returning plain under the soffit; engaged Doric columns are on either side. Above the door leading from the return corridor on to the terrace is an imitation oyster-shell, projecting 2ft. forward, supported by a bracket at

each edge. The letters "V.R." stand out in high relief from a richly-ornamented frieze between the door-head and shell. An architrave runs round the opening.

The work has been done in a very substantial manner. The building is fireproof, with the exception of the roof directly above the Durbar Room, which is queen-framed and slated. The principals are 30ft. span, averaging 8ft. centres; the flat top is only 2ft. above the balustrade. At one spot the exterior wall came directly on the edge of a large well 10ft. diameter and 35ft. deep, being one of a number forming a reserve water supply, the ordinary supply being obtained from one 100,000-gallon covered reservoir one mile away, the water being pumped thence by steam power into the cisterns throughout the house. In order to carry the wall across the well, a monolithic mass of concrete was formed half-way round the 9in. dome; above the footings to the 18in. wall, three double-headed ordinary steel railway bars 21ft. long were firmly bedded and tied in, the brickwork being executed round it in Portland cement. The floors are formed of half-brick arches springing from corbels or rolled joists, the spandrels after being filled in with dry brick rubble. The girders carrying the ceiling of the Durbar Room are built up of wrought iron 21in. and 22in. deep: those carrying the half-brick partitions have an extra thickness to the compression flange. The spandrels of roof arches are filled up with concrete to 6in. above the crowns of the arches, and laid to fall 2in. in 10ft.; two courses of sole tiles (11in. by 6in. by 1in.) were then laid in cement, the surface being finished by an inch rendering of Portland cement. All walls are built solid; all external walls are battened internally, horizontals of oak 3in. by 1 1/2in., 2ft. 6in. centres; verticals 2 1/2in. by 1 1/2in., of deal, 15in. centres. Hot water is laid on to the bath and the sinks, the supply being drawn from a copper cylinder in the roof, in circulation with an inner copper vessel of a small boiler in the basement. On the ground floor there are 2,500ft. of 4in. hot-water pipe. The coils of pipe are laid in brick channels where there is no basement, and incased in the ceiling where there is. Brass hit-or-miss ventilators are placed at convenient points in the corridors both on the ground and first floor for the admission of the warm air, brick shafts carrying the air from the chambers. In order to tie the walls together, and thus materially strengthen the carcass, 3in. by 3in. endless W.I. bond was bedded 2in. from the inner face of the wall at all girder-levels, thus also counteracting the thrust of floor arches. If in any case the thrust of an arch came directly on the wall, the substance of the bond was increased to 3in. by 3in.

The Durbar Room so-called, by its nature an Indian room, is 60ft. long by 30ft. wide, and 19ft. high, with a large bay window 17ft. by 8ft. on the lawn side. It was to supply a room of these dimensions that the wing was built, there being no room, except the drawing-room, in the house approaching this size. For the almost annual visits of the Emperor of Germany, and on such occasions as the visit of the French Fleet, a large dining-room is essential. Bhai Ram Singh, from the School of Art, Lahore, is the artist; the work is a creditable monument to his skill as an artist, and also as a modeller. The design is so intricate and unsymmetrical that it is next to impossible to give a comprehensive description of it. The ceiling is composed of large panels and beams, with ornament, generally in very high relief, covering the entire surface; circular pendants project down from the junction of the beams. Members of the animal and vegetable kingdoms enter largely into the ornament. The profuseness of the enrichment, and being of such a varied and prominent character, produces a wonderfully fantastic effect. The panels were cast in one in fibrous plaster; the beams mitring covered the joints. Double brackets of magnificent design intercept and break the coved cornice at suitable points. A dado 5ft. high (including starting and sub-base) runs round the room, framed in mahogany, with panels in papier-mâché and carton pierre. A gallery intended for musicians projects 6ft. from the wall at the lower end, partly supported on two piers; from floor to floor is about 9ft. The centre 16ft. between the piers has three large openings, the centre one, being widest, leading on to a balcony carved in mahogany, with panels between the stiles of a very intricate and effective geometrical pattern. These panels were executed in India.

The chimneypiece on the opposite side central of the bay window is framed in mahogany with carton-pierre enrichment. Three columns placed triangularly on plan form the jambs. The opening is 5ft. square; thick chamfered pieces of veined marble protect the woodwork from the stove. Above the chimneypiece stands an enormous peacock with extended tail, covering a surface 5ft. square. The large opening to the bay is arched, the domed ceiling to the bay abuts against the arch. The principal entrance is from the main corridor by folding doors (10ft. by 6ft.) Above the door in a recess sits composedly a miniature representation of the Hindoo god Schwiji. Besides the above door there are two at each end. The whole will be painted and finished in white and gold. When completed, this room will look one of the grandest in the country.

CHIPS.

The first section of a steam laundry has just been built in Onslow-street, Guildford, at a cost of £2,000. As at present fitted the laundry will employ between 45 and 50 hands. Messrs. E. and A. Miles have been the builders, and Mr. A. J. Sturges the architect, the work being carried out under the superintendence of Mr. Adams. Messrs. Manlove, Alliott, and Co. supplied the machinery, and the electric light plant has been supplied by Messrs. Appleton, Burbey, and Williamson.

An important work of restoration is being carried on at Ely Cathedral. The roof was found in some parts to be in a bad state, the wood being much decayed. The work of restoration was commenced a month or two ago, but it has proved a more formidable undertaking than was at first anticipated. About 30 tons of new lead have already been used in the re-covering of the roof.

The will of Mr. Henry Brown, late of Highfield, Luton, Beds, timber merchant, who died on May 1st has been proved, the value of the personal estate exceeding £28,000.

The concluding meetings of the annual congress of the Cambrian Archaeological Association were held on Friday at Llanddillo. Excursions were afterwards made to the old British fortress and earthworks of Carnagoch and Castellmeurig, the ancient churches of Llangadock, Llanfairabryn, and Llandingat, Llandovery Castle, and the Roman Station.

The city council of York have resolved to form a promenade on the Clementhorpe bank of the Ouse at an estimated cost of £4,800.

The annual loan collection of pictures at the People's Palace, Mile End-road, London, was opened to the public on Saturday, and will remain on view until the 10th September. This year the show at the People's Palace is quite up to the high level reached in former years, and covers more space than on any previous occasion. The works on loan include examples by Sir J. Gilbert, E. Long, J. E. Hodgson, F. Goodall, Phil Morris, J. W. Waterhouse, Dandy Sadler, H. T. Wells, and Briton Riviere.

The church porch at Ruyton-XI-Towns, Salop, has just been carried out by Mr. Warwick Edwards, from plans by Mr. A. E. Lloyd-Oswell, of Shrewsbury.

At the Pontypridd police-court, on Wednesday, the Pontypridd local board summoned S. F. Lewis, of Llandaf, who is erecting a large number of houses at Pontypridd, for proceeding with the erection of certain dwelling-houses before the plans were passed. The clerk to the board conducted the prosecution, and the defendant, who pleaded that he had committed the offence in ignorance, was fined 10s.

In connection with the restoration of the ancient Grammar School and Guildhall at Stratford-on-Avon, now in progress, some interesting discoveries have been made. Human bones, portions of coffins, and fragments of wrought ironwork have been found wherever it has been necessary to excavate for new foundations. There have also been found pieces of carved and moulded stone, exactly corresponding with the chapel of the Guild of the Holy Cross, which was rebuilt in the time of Henry VII.

The formal opening of the Market House, erected by the Bilston Township Commissioners, upon the old market ground, off Church-street, Bilston, took place on the 9th inst. The plans were prepared by Mr. S. Horton, of Wednesbury, the contract was undertaken by Messrs. Dorset and Son, of Cradley Heath, and the total cost has been £8,000. The premises consist of a single rectangular hall, without structural divisions, but divided up into 140 stalls and shops. Out-offices are provided in Vine-street. The hall is lighted by roof lights. The building is constructed almost entirely of red brick, but in the principal frontage the material is terracotta.

Building Intelligence.

BIRMINGHAM.—Four very important new buildings, or additions to existing buildings, for educational purposes, are, says the *Birmingham Post*, now in hand in that city—namely, large and important additions to Mason College and the Municipal School of Art, a Girls' Grammar School at Camp Hill, and a Seventh Standard School for purposes of technical instruction at Small Heath. The additions to Mason's College are being made at the rear, and consist of medical schools to cost £20,000; Messrs. Cossins and Peacock are the architects, and Messrs. W. and J. Webb, also of Birmingham, are the builders. The Central Municipal School of Art is being enlarged by the addition of a wing of nearly equal size. The extension is being carried out by Messrs. Martin and Chamberlain, and the builder is Mr. John Bowen. The cost of the building, apart from the site, will be about £11,500. This extension will complete a block of important public buildings, consisting of the School of Art, the Parish Offices, the School Board Offices, and the Medical Institute, entirely covering the large area bounded by Edmund-street, Margaret-street, Cornwall-street, and Newhall-street. The girls' department, now being added to the Camp Hill Grammar School, is being built from plans by Messrs. Martin and Chamberlain, Messrs. Moffatt and Son being the builders, and at the same time the accommodation in the boys' school is being increased from 250 to 350 places. The building is Modern Gothic in character, and faced with red brick, terracotta being used for dressings; 312 girls will be accommodated, and the total outlay will be £15,000. The new board school at Small Heath will cost about the same amount, and is a one-story building for 300 boys and 300 girls. Messrs. Martin and Chamberlain are the architects, and Mr. T. Rowbotham, of Coventry-road, Birmingham, is the contractor.

BOWLING, BRADFORD.—The buildings at Bowling Cemetery have been completed by the erection of the Roman Catholic chapel. The chapel occupies a position at the eastern extremity of the central terrace, the Nonconformist chapel being at the western end. The chapel provides sitting accommodation for about one hundred persons. Messrs. Morley and Woodhouse are the architects, and the contractors for the several works have been—W. Farnish, mason; F. Clough, plumber; John Bolton, plasterer; Thornton Brothers, slaters; A. Arundel, painter, all of Bradford; and J. Deacon, joiner, of Shipley.

BROWNEDGE.—The Roman Catholic Church of St. Mary, Brownedge, near Preston, built in 1828, has been practically reconstructed from plans by Messrs. Pugin and Pugin, of Westminster, and was reopened on Sunday week. The edifice is now cruciform in shape. On each side of the nave large transepts have been erected, and on either side of the chancel are chapels. A gallery has been erected at the west end, principally for the accommodation of the choir. A new altar is being erected; it is composed principally of Uttoxeter alabaster and marble shafts; the canopy, when completed, will be 30ft. from the floor. Round the sanctuary, and forming corbels to the shafts between the windows, are angels bearing musical instruments, carved in Stourton stone. The carving has been done under the superintendence of Mr. P. Honan, of Chester, who has the altar in hand. The present accommodation is for 1,100 persons. The contractor was Mr. Charles Walker, of Arthur-street, Preston.

KILDARE CATHEDRAL.—A meeting was held at the courthouse, Kildare, for the purpose of raising funds to complete the restoration of St. Bridgid's Episcopal Cathedral—a building erected in 1229, but allowed to fall into ruin in the 17th century. About twenty years ago £7,000 was subscribed, and the work was commenced, but was suspended, and in December, 1890, a fresh effort was made and another £2,000 was contributed, while the present proposal is to obtain a further £2,000 for the completion of the choir. The committee's report stated that the new choir is being built by Mr. Henry Sharpe, under the superintendence of Mr. J. F. Fuller, F.S.A., diocesan architect. The character of the old masonry is being reproduced as closely as possible in the new, and the architectural features of the building are preserved. The east wall is

pierced by three single-light lancet windows. There are two single lights in each flank. The crenulated finish to the stonework at the level of the eaves will be continued as on the nave and transepts, and the stepped gable will terminate with a cross. Inside it is proposed to finish the walls without plaster. Caen stone arcading carved in diaper work will cover portions of the north and south faces, and run across the east end to the level of the window-sills. On the south side the divisions form the sedilia and credence table. Each compartment is surmounted by a trefoil head and gable, with carved finial. The portion of the arcading immediately behind the holy table has a greater projection from the face of the wall, and is divided into quatrefoiled panels, finishing under the centre light with a crenulated cornice, the whole forming a reredos. The present contract embraces but a portion of the work to be done, but will, when finished, leave this ancient cathedral complete, so far as the structure is concerned, and in the cruciform shape in which it stood before its destruction in 1641. Much, however, remains to be done internally—the finishing of the walls of the nave and transept, filling the windows with rolled cathedral glass, laying a concrete floor and tiling, putting in adequate heating apparatus, stalls, seating accommodation, and an organ.

SOUTHPORT.—The scheme for the erection of a new infirmary in Southport has taken a practical shape. The plans sent in by Mr. C. S. Ingham, of Manchester, have been adopted by the general committee, and working plans are now in course of preparation. The committee originally decided that the cost of the building (apart from furnishing) should not exceed £12,000, but the expenditure will be much greater. The beneficiaries of the Scarisbrick estate have given the site (on Scarisbrick New-road), which is valued at £5,000, and the subscriptions already promised amount to £15,400.

TENBY.—The foundation stone of the new Roman Catholic Church to be built in the Potter's Field at Tenby was laid on Wednesday week. The principal dimensions of the church are:—Chancel, 20ft. by 18ft. 6in.; sacristy, 15ft. 8in. by 12ft.; nave, 63ft. by 30ft. On the south side will be a side chapel and the confessional. The east end will abut on the road, the sanctuary being lighted by two single-light windows. It will have an elevation externally of 47ft., the front being furnished with carvings of saints, the centre niche being filled with a full-sized figure and ornamental carvings. On the south side of the nave will be an arcade, preparatory to the extension of the building by an aisle. In the west end there will be a four-light window, over a gallery, the latter being approached through a turret stair. The turret stair will have an elevation of 40ft., surmounted by a spire 20ft. in height. The church will be built of native stone, with Bath stone dressings for windows. The architect is Mr. F. A. Walters, F.S.A., 4, Great Queen-street, Westminster, and the contractor, Mr. Geo. Richards, builder, Tenby. The cost of the building, exclusive of the site, will be upwards of £2,600.

It is proposed to build a theatre to seat 2,200 people near the Tate Free Library in Brixton-road. The building is to be of red brick with stone dressings; the lighting will be by electricity, and the auditorium is to be free from columns. Messrs. Crewe and Sprague are the architects, and Messrs. Newman the builders.

The Bristol rural sanitary authority have under consideration a scheme for a supply of water for Wotton-under-Edge, to be derived from Hamlin's Brake. Mr. Cotterell, C.E., of Bristol, has prepared the plans and report, and estimated the cost at £6,500.

During last week operations were commenced on the Middlewich section of the North Staffordshire Canal in connection with the scheme for widening and deepening the whole length of the canal from Preston Brook to the Potteries, a distance of about 30 miles. About 500 men are now at work on No. 1 section, which is twelve miles in length, and extends from Middlewich to Anderton. It is intended to widen the canal to a uniform width of 45ft., and to make it a uniform depth of 6ft., so as to allow of the passage of steam barges carrying about 80 tons. This will necessitate extensive alterations, as all the locks have to be widened from 7ft. (as at present) to about 16ft., and the numerous bridges along the canal will have to be taken down and rebuilt. The alterations will cost over £50,000.

Engineering Notes.

THE COST OF THE MANCHESTER SHIP CANAL.—The special committee of the corporation charged with the consideration of the affairs of the Manchester Ship Canal submitted an important report to the city council at its meeting on Wednesday. The report gives detailed statements concerning the financial position of the company, and the estimated cost of works and equipment to open the canal for traffic to Manchester. The estimate of the engineers, Mr. E. Leader Williams, chief engineer of the Canal Company, and Mr. George H. Hill, engineer to the corporation, is that from the 1st June last until the 30th December, 1893—the date at which it is expected the canal will be completed—the total outlay on the works will be £2,182,433. They add that this estimate does not provide for any contingencies such as damage by floods other than a sum of £85,000, which is included in the amount of the total outlay. It appears from this that in addition to the loan of three million already arranged by the Manchester Corporation, a sum of £1,489,282 will be required for the completion of the canal. Consideration of the report has been postponed till Sept. 7th.

CHIPS.

The building to house the Althorpe collection, Mrs. Ryland's gift to Manchester, has for some time been in course of erection on a site between Spinningfield and Wood-street, Deansgate, Manchester. The architect is Mr. Basil Champneys.

The last day for sending in competitive designs for the municipal technical schools at Manchester was Tuesday in this week.

The music-hall in Oxford-street, W., has been pulled down, and will be replaced by a new one built on modern plans, and seating nearly 2,000 persons. Mr. Frank Kirk is the contractor. The memorial stone was laid on Monday by Mr. Charles Morton.

Damage to the extent of over £10,000 was occasioned by the fire which occurred on Monday at Mr. L. Duke's premises, the Alexandra Timber Wharf, on the banks of the Regent's Canal, Hackney.

At Worcester, Ernest W. Sumner, a builder, was committed for trial on Friday, at the assizes, charged with having incited William Sampson, one of his workmen, to set fire to a workshop on August 4. We gave the evidence for the prosecution last week.

The repaving and recausewaying of London Bridge were commenced on Monday, and will occasion some public inconvenience till the end of next week, as only one line of traffic in each direction is allowed in the meanwhile. The contract has been taken at about £5,000 by Messrs. Mowlem and Co., whose men will be employed night and day during the fortnight required for the operations.

The foundation stone of an infants' department which is being added to St. Saviour's Church schools, Herne Hill-road, Camberwell, was laid on Tuesday week. The schools will accommodate 100 infants. Mr. J. R. Manning, M.S.A., is the architect, and Mr. Rodwell the builder.

The corporation of Cardiff have unanimously decided to retain for themselves powers obtained under a provisional order, and electric-light works are to be started at once for supplying current on the moderate high-tension system within the compulsory area of the town. A plan has been prepared by Mr. W. H. Massey, electrical engineer, and the scheme will be carried out by the borough engineer and his staff.

Bruce Castle Park, Lordship-lane, Tottenham, recently acquired by the Tottenham Local Board at a cost of £15,000, to be defrayed out of the rates, was on Saturday thrown open to the public. The park is well timbered and nearly 20 acres in extent. As the name suggests, it contains the modernised remains of the castle built by the grandfather of King Robert the Bruce.

A Royal charter has been granted for the incorporation of Torquay and Southend-on-Sea as boroughs.

The name of Mr. Murray Wyatt Marshall, timber merchant of Godalming, Andover, and Haslemere, has been placed on the commission of the peace for the first-named borough.

The parish church of Stoke-next-Guildford was reopened by the Bishop of Winchester last week, after the reroofing of the nave, and the removal of the organ from the western gallery to the chancel, and the reconstruction of the instrument. Mr. R. Wood, of Guildford, carried out the building operations at a cost of £350, and Messrs. Bishop and Son, of Marylebone-road, N.W., the organ repairs at a further cost of £260.

TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

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ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

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SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL, XLII, XLVI, XLIX, L, LI, LIII, LIV, LVII, LIX, LX., LXI, and LXII may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—G. M. and B. R. Co.—Geologist.—B. S. P.—J. W.—F. T. B. Co.—Lancastrian.—W. T. (Truro).

Correspondence.

A CORRECTION.

To the Editor of the BUILDING NEWS.

SIR,—In your issue of the 12th inst., under the heading "Chips" on p. 235, you state that the parish church of Bourton-on-the-Water is being re-seated and restored by Mr. George Poole, contractor, of Bourton-on-the-Hill.

The real facts of the case are that the church of Bourton-on-the-Hill is being re-seated in pitch-pine by the village carpenter, Mr. George Poole, from my designs and instructions. The fine old church is not being restored or touched in any way, and the church at Bourton-on-the-Water, some eight or nine miles off, has nothing to do with the matter at all. This latter has been restored by Mr. T. G. Jackson.

I shall be glad if you will correct this in your next issue.—I am, &c., E. GUY DAWBER.
22, Buckingham-street, Strand, W.C., Aug. 13.

Mr. S. Towson, surveyor to the Erith Local Board, has been appointed surveyor to the Cheshunt Local Board.

A special service was held last week at Rolleston parish church in celebration of the completion of the restoration and enlargement; Sir Arthur Blomfield and Son, architects. A new north aisle and vestry have been constructed. The vestry is situated at the east end, and is partitioned by an oak screen. The seats and benches in, and the roofing of, the main aisle are of the same wood, while the floors are laid with tiles similar to those in the nave, which, with the south aisle, has also been provided with a fresh roof. The old walls have undergone renovation. The special gifts include a lectern of burnished brass, an oak pulpit, reared on a stone base, with brass hand-rail, and a reredos in alabaster, the latter subject being representative of the Transfiguration, executed by Mr. R. Bridgman, of Lichfield. The three-light east window has been extended.

Intercommunication.

QUESTIONS.

[10825].—**Multiplying Sketches.**—Could any reader tell me of a simple method of producing a number of copies of letters with sketches, &c.? I have tried the "stylograph," but find it unsuitable on account of the dotted line, while the gelatine copier I have is a complete failure!—F. H. S.

[10826].—**Well.**—Having a dumb well to construct about 50 yards from building (residence), and being in doubt as to best means and system of constructing it, I should esteem it a kindness of some reader would give me his opinion as to system, &c. At present I propose building it with open shaft to discharge gases 6ft. above ground, and with an arrangement for separating solid from liquid matter.—XXX.

[10877].—**Boiler.**—Will some reader tell me how to calculate the following? A boiler can be filled by two pipes—one fills it in 40 minutes, and the other in 50 minutes; the discharge-cock empties it in 25 minutes. How long will it take to fill the boiler if the two inflow pipes and the discharge cock are all open together; also if the discharge-cock and one pipe are open.—CIRCULATION.

Legal.

RESTRICTIVE COVENANTS.

RESTRICTIVE covenants in old leases are sometimes found difficult of construction, because of the changes in trade that have taken place since they were drawn up, and the different meanings that some of the old words have since acquired. This is frequently felt in the case of restrictive covenants as to the kind of business that may or may not be carried on upon the premises in question. It may be here noted that if it is intended to prevent a house being used for any other purposes than a private residence, the shortest and simplest way is to declare this by making the lessee covenant to occupy it as a private dwelling-house only, without referring to any trade or business whatever. But if it is desired only to prevent the use of the premises for a certain stated business, whether by lessor or lessee, it is advisable to define and explain the trade that is to be excluded more carefully than is often done by the use of a single word.

In a recent case ("Fitz v. Iles," *Times*, Aug. 12) an action was brought to enforce the performance of a covenant made by the lessor in a lease of 103, Bermondsey-road, and which was let to the lessee as a coffee-shop, whereby the lessor bound himself not to let any other shop in the same street over which he had any control for the purpose of a coffee-house. It appeared that the lessor had let to the two other defendants in the case No. 113, in the same road, under a lease by which they as lessees covenanted not to use the premises as a coffee-house. It appeared, however, that these defendants as such tenants were going to sell cups of tea and coffee and light refreshments generally, and were going to open a billiard-room on the premises. The plaintiff now applied for an injunction to restrain the defendant his lessor from letting these premises as a "coffee-house," in breach of his covenant not to do so, and to restrain the other defendants his lessees from so using the premises. As against the defendant the lessor the Court held there was no case, because he had put a similar restrictive covenant in his lease to his tenants, and had bound them not to open as a coffee-house; but the Judge granted the injunction asked against the other defendants, these tenants, because he thought their business was substantially a breach of the covenant, taking the old word, "coffee-house," in its modern meaning, of a place where cups of tea and coffee could be obtained.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

A museum was opened at Hastings on Tuesday on one floor of the Brassey Institution. The articles on exhibition include the original charter granted to the borough by Queen Elizabeth, and a case of coins of Sussex mints of the time of Athelstan, contributed by Mr. Barlow Webb. Sir Anchtel Ashburnham lends a cloth of gold, part of the corporation canopy used at the coronation of George II. in 1727. The museum has also been enriched by the Rev. J. W. Tottenham, Mr. Felix Joseph, Mr. Charles Dawson, and others.

LEGAL INTELLIGENCE.

FREEDHOLD LAND AT LEYTONSTONE.—Surveyors' Institution, June 23rd and July 14th (before Mr. Charles Bidwell, F.S.I., of Ely and Cambridge, umpire; Mr. Herbert H. Fuller, F.S.I., of 15, Serjeants' Inn, Fleet-street, E.C., arbitrator for the claimant; and Mr. Howard Martin, F.S.I., of the firm of Messrs. Thurgood and Martin, 27, Chancery-lane, W.C., arbitrator for the railway company.)—Taylor v. Tottenham and Forest Gate Railway Company.—The claimant in this compensation case was Mr. Richard Taylor, of Landermere-villas, Granleigh-road, Leytonstone, Essex, and his claim was laid in respect of a parcel of freehold land (with old buildings thereon) situate in Granleigh-road, Leytonstone. The property is about half an acre in extent, or 18,500sq.ft., and had been used by the claimant for eleven years past as a machinery depot. Mr. Atherley-Jones, M.P., and Mr. C. E. Seth-Smith (instructed by Messrs. Morse, Hewitt, and Farman, 37, Walbrook, E.C.) appeared for the claimant; and Mr. H. F. Dickens, Q.C., and Mr. R. J. Parker (instructed by Messrs. F. C. Matthews and Browne, 151, Cannon-street, E.C.) represented the railway company. The case occupied two complete days—viz., June 23 and July 14—and the witnesses examined on behalf of the claimant were Mr. E. H. Bousfield (Messrs. Edwin Fox and Bousfield, 99, Gresham-street, E.C.), Mr. Richard Taylor (the claimant), Mrs. Ada Wallace, Mr. F. Alchin (engineer), Mr. H. H. Fuller, F.S.I., Mr. G. F. Morris, F.S.I. (Messrs. Protheroe and Morris, 67 and 68, Cheapside, E.C., and Leytonstone), Mr. E. F. R. Wyld (Messrs. Wyld and Venables, 69, Moorgate-street, accountants), and others; and the witnesses for the railway company were Mr. Daniel Watney, F.S.I. (Messrs. Daniel Watney and Son, 33, Poultry, E.C.), Mr. Howard Martin, F.S.I., Mr. Christopher Oakley, F.S.I. (Messrs. Daniel Smith, Son, and Oakley, 10, Waterloo-place, S.W.), Mr. Wilfred Airy (civil engineer, Great Queen-street, S.W.), Mr. A. A. Hollingsworth, and Mr. George Shead, accountant, of Laurence Pountney Hill, E.C. From the evidence it appeared that the property had been in the claimant's possession as freeholder since 1831, and that it was partially covered with buildings consisting of stables and a large barn, all of them being ancient brick structures. There was also a large yard, and the claimant let off a portion of the premises, and carried on his business as a dealer in, and repairer of, boilers, engines, and other machinery. The land was alike valuable both as trade premises and as eligible building land. Mr. E. H. Bousfield valued the land, as partly trade premises and partly building sites, at £2,552. Mr. H. H. Fuller valued the land at £2,820, and Mr. G. F. Morris made the total value £2,904. In the claim was included an item for loss sustained by the claimant on a forced sale of his stock-in-trade, and there was also a claim in respect of goodwill. The evidence adduced on behalf of the railway company as to the value of the land was as follows:—Mr. Daniel Watney valued the same at £741; Mr. Martin valued it at £708; Mr. E. L. Curtis valued it at £718; and Mr. Christopher Oakley valued it at £686. The claimant gave evidence to the effect that he had raised the sum of £900 on mortgage of the premises about four years ago. He further gave evidence as to his trade claim and the earnings of his business over a period of three years, and was cross-examined at great length. Mr. Wyld stated that he had examined the claimant's rough day-book (this being the only book kept), and he found that the gross sales for 1888 amounted to £1,869, in 1889 the amount was £3,049, and in 1890 the gross sales were £2,462. Mr. Charles Bidwell has awarded the claimant the sum of £2,345.

TAXATION OF ARBITRATORS' FEES.—In the Queen's Bench Division, on the 11th inst., an application was made *in re* an arbitration between Prebble and Robinson and another. Mr. Moyses, for the defendant, said this was an arbitration between a builder named Prebble and Messrs. Robinson and Fisher, and the question raised was whether arbitrators' fees were subject to taxation. The Master and the Judge at Chambers had held that they were not, and therefore the present appeal. The two arbitrators and the umpire, who were all surveyors, sat at the Imperial Hotel for one day for five or six hours, and for two hours upon a second day, and their charges amounted to £153 odd. The award was that Robinson and Fisher should pay Prebble £310 and costs, and the amount of their charges was paid by Prebble to take up the award. The amount was included in the costs, and upon taxation defendants objected to the amount, but it was held that the question could not be gone into in view of a recent decision. Mr. Marshall, for the plaintiff, said no doubt the arbitrators only sat a day and a part of another day at the Imperial Hotel, but the arbitrators and the umpire had previously met on the spot for the purpose of measuring up the work. Afterwards, moreover, the arbitrators met the umpire for two days, and the award had to be drawn up and submitted to counsel. The £153 also included an amount for the hire of the room, so that upon the whole it might be found to be reason-

able. The Lord Chief Justice and Mr. Justice Cave concurred in allowing the appeal.

BANKRUPTCY OF AN ILFRACOMBE ARCHITECT.—At Barnstaple Bankruptcy Court on Thursday in last week, the case of Joseph Yeardye, architect, of Ilfracombe, was called. The statement of accounts showed that the gross liabilities of £2,824 1s. 11½d. were made up as follows:—Unsecured creditors, £458 10s. 7½d.; fully secured creditors, £1,870; partly secured, £330; contingent liabilities, £132; rent and wages, £33 11s. 4d. The liabilities expected to rank for dividend were £580 10s. 7½d., against which were placed assets amounting to £885 0s. 8d., giving a surplus of £300. £310 of the assets represented surplus from securities in the hands of creditors fully secured.

RE W. F. CONEY.—An adjourned first meeting was held under this failure on Friday. The debtor, a builder and contractor, carrying on business in Fore-street, City, returned his gross liabilities as £25,225, of which £22,255 are treated as fully secured, and assets £1,020. The debtor commenced in December, 1888, with a capital of £500, and his business has consisted in contract work and speculative building in London. A composition of 7s. 6d. in the pound was accepted, payable in two instalments at one and four months.

RE JAMES GREENWOOD.—The bankrupt, who traded as a builder and contractor at 86, Cannon-street, City, and Maltby-street, Bermondsey, under the style of James Greenwood and Son, failed in November last, and applied for his discharge on Friday. Proofs amounting to £5,525 have been made, and the trustee reports that the assets will realise about £9,000, that a dividend of 10s. in the pound has been declared, and that a further dividend of 10s. will be paid. No offence was reported, and Mr. Registrar Hope granted the bankrupt his immediate discharge, together with a certificate that his failure was due solely to misfortune, without misconduct on his part.

IMPORTANT ARBITRATION CASE AT ILFRACOMBE.—**LE LIEVRE AND DENNES V. W. H. GOULD.**—This case, which was referred by Mr. Justice Hawkins on July 2nd, came before Mr. Edward Ridley, Q.C., an Official Referee of the High Court of Justice, at the Town Hall, Ilfracombe, on the 10th inst. The parties were Mrs. Caroline Margaret Le Lievre and Edgar Thomas Martin Dennes (plaintiffs) and W. H. Gould, architect and surveyor, of Ilfracombe (defendant). The action was one for damages for giving certificates which were not trustworthy in the matter of houses at Kingsley-avenue, Ilfracombe. Mr. Montague Lush, in opening the case, stated that Mr. Hunt, of London, was the architect of two houses at Kingsley-avenue, adjoining the Wildercombe Park Estate, and the builder was Wm. Lovering, who, it was arranged, should be financed by the plaintiff Dennes upon certificates being given by Mr. Gould, a local surveyor, that the buildings had reached certain stages, and that they were erected in accordance with a "schedule of advances." The sum of £850 was to be advanced in eight instalments, when certain conditions had been complied with. The double capacity occupied by Mr. Gould of being surveyor to the Local Board, as well as being the agent of the plaintiff, gave him extra opportunities for seeing that the work was properly done. The work of erection by Lovering began, and after about £400 had been advanced by Dennes, he transferred the mortgage deed to the plaintiff Le Lievre, and she advanced the remainder of the sum. In November, 1891, the property was inspected by Mr. Hunt, who interviewed Mr. Gould and told him that, from what he had heard, the houses were not properly built. They inspected the property together, including the drainage, which furnished great cause for complaint, and he believed Mr. Gould expressed his own astonishment at what he saw: the whole of the drainage would have to be reconstructed; the main walls were out of perpendicular, and the houses were worth next to nothing. Judgment was obtained against Lovering in the County Court, but it was fruitless, as they could not obtain a penny. After this a formal complaint was made to Mr. Gould, who replied that he did not undertake to value, but simply gave certificates that the building had reached certain stages, and that the sums previously agreed upon to be advanced were consequently due. Counsel also asserted that Mr. Gould was acting in a third capacity, as builders' merchant, and supplied Lovering with lime and other material. This was not vital, but would serve to show that they were inducements to tempt Mr. Gould to be more free in granting certificates than he otherwise might have been. The Court then adjourned to inspect the buildings, after which Mr. Hunt was called, and corroborated the counsel's statement as to Lovering being financed by the plaintiffs. He afterwards visited Ilfracombe, and examined the buildings, when he found them in a very unsatisfactory condition. Mr. Gould informed him that he had only been paid the sum of 5s. per certificate to report on the progress of the building, and not on the matter of the structure. Mr. Arnold Thorne, F.R.I.B.A., of Barnstaple, said he surveyed the houses in Decem-

ber, 1891, and found the mortar was of a very inferior quality, and hardly contained a vestige of lime: the walls were not perpendicular, and no special provision had been made to keep out the damp. The drainage also was very bad, and he considered that the certificates must have been given in total ignorance of the condition of the building. It would require at least £200 or £250 to make the houses at all habitable. Mr. Harbottle, of Exeter, county surveyor, corroborated the last witness.—On Thursday, the 11th inst., Mr. Finch made a speech for the defence, and evidence was given by Mr. Joliffe, mason, and Mr. Gould. The Official Referee, in giving judgment, said Mr. Gould was certainly much to blame for the negligence he had shown, and he should have given judgment against him in the sum of £300 damages had it not been for a technical objection, which was that he decided that Mr. Dennes, in so far as he had lost interest in the case, was not the proper plaintiff. He should, therefore, give judgment in favour of the defendant, with costs, but give the plaintiff leave to appeal to the Courts on the ground of the objection, and stay costs until September on these grounds.

ARCHITECTS' CLAIM FOR COMMISSION.—**CLEGG AND SONS V. THE INTERNATIONAL OKONITE COMPANY, LIMITED.**—At the Liverpool Assizes, on Thursday, August 11th, judgment was given in this case, which was tried on the previous Tuesday. The action was brought by the plaintiffs, who are architects in Manchester, against the defendants, manufacturers of electrical wires and cables at Newton Heath, for professional services in connection with the erection of defendants' works. The defendants counter-claimed damages for alleged negligence. Mr. Justice Denman said the claim was for £129 13s. 3d., balance of commission earned and work done by the plaintiffs, and the great question was, had the plaintiffs made out that they were entitled to remuneration at the rate of 3 per cent. commission, which was claimed, or at the rate of 2½ per cent. He had carefully looked into the matter, and had come to the conclusion that Mr. Clegg's recollection of the bargain was to be preferred. He thought the plaintiffs had made out that that part of their case, subject to any small deduction with regard to the amount on which the commission was to be claimed. The second item in the claim was for £73 6s., which was for a good many things, such as preparing drawings, original surveys, &c., and he did not think that this claim was other than a fair and reasonable one. With respect to the counter-claim, he did not find that the defendants had suffered any damage by reason of any negligence on the part of the plaintiffs. His lordship therefore gave judgment for the plaintiffs for the amount claimed on the claim and counter-claim, with costs.

IN RE WILLIAM GARDNER, EASTBOURNE.—At a special sitting of the Eastbourne Bankruptcy Court held on Monday, William Gardner, a builder, of Eastbourne, presented himself for his public examination. The gross liabilities, according to the statement of affairs, were £5,362 19s. 9d., of which only £352 14s. 1d. was expected to rank for dividend. The assets were stated to be £332 17s. 9d., showing a surplus of £20 5s. 8d. The debtor was examined by Mr. Cully, the official receiver. He came to Eastbourne eight or nine years ago from Brighton, where he had worked for Mr. Chappell. He started in Eastbourne without capital, and commenced speculative building in 1882. He had not kept books other than a pocket-book. He was closely questioned as to his dealing with the mortgagee of his property, and the examination was adjourned till Oct. 6th.

A new bank is in course of erection at Bowness, for Messrs. Wakefield, Crewdson, and Co. Messrs. T. and M. Atkinson, of Windermere, are the contractors.

At the Milverton Police-court last week, William Slater, surveyor to the Warwickshire County Council, was charged with keeping a carriage for which he had no license. He pleaded guilty, but added that he did not know the carriage was liable, inasmuch as he was allowed a horse and trap as surveyor to the County Council. The Bench thought there had been some misunderstanding, and dismissed the case on payment of 12s. 6d.

The question of providing an ocean mail steamship pier at Portishead, Bristol, is being pushed forward with vigour. The money, about £200,000, is promised by a syndicate, and a provisional contract has been entered into with Messrs. Pearson, of London, who are in negotiation for the purchase of the necessary quarries for raising the stone.

At the Kremlin at Moscow work has recently been resumed on the colossal monument in the course of erection to the Czar Alexander II. This will be 154ft. in width by 123ft. in depth, and is in harmony with the Kremlin itself, which includes features both of the Italian and the Byzantine styles. In the interior will be placed a statue, heroic in scale, of the Emperor, in green bronze, on a pedestal of granite.

WATER SUPPLY AND SANITARY MATTERS.

ELY, CARDIFF.—The rural authority, at their monthly meeting on the 10th inst., accepted the offer of the guardians of Ely schools to contribute £600 towards the drainage of the village of Ely on condition that the sewage of Ely schools was taken in. The guardians are spending about £20,000 on the extension of the schools, and are anxious about the drainage, which at present is very unsatisfactory. Mr. Fraser, A.M.I.C.E., surveyor to the rural sanitary authority, has prepared plans and estimates for a scheme costing about £1,000 and a yearly subsidy to the corporation of Cardiff of about £40 for permission to drain into their sewer, which is to be extended for that purpose. The sanitary authority also resolved to give two months' notice, in accordance with section 53 of the Public Health Act, 1875, of their intention to construct a reservoir for the supply of water for the parish of Padyr, in accordance with plans prepared by their surveyor, Mr. Fraser, A.M.I.C.E., at an estimated cost of about £1,500.

LLANDAFF.—The sewerage of Llandaff Yard and Maindy, in the district of the Cardiff Rural Sanitary Authority, is now, with the exception of the pumping-station, complete. The authorities are very anxious to connect with the joint sewer into which this part of their district is to be drained, but for some unexplained reason permission to connect is withheld by the joint board, although several applications have been made by the rural authority. The cost of this scheme will be about £3,500.

WHITCHURCH.—The Whitchurch vestry held a meeting at the board schools, Whitchurch, on the 5th inst. to consider plans prepared by Mr. Fraser, Assoc.M.Inst.C.E., surveyor to the rural sanitary authority, for the drainage of that parish. The plans, as explained by Mr. Fraser, provide for a large prospective population. The scheme is divided into nine sections, and is estimated to cost about £6,200. The meeting was eventually adjourned for a fortnight, so that the ratepayers of the parish might have a chance of inspecting the plans.

CHIPS.

The Wandsworth district board of works proceeded, on Wednesday week, to elect a surveyor at a salary of £300 a year, rising by regular increments to £450. Out of 83 candidates Mr. P. Dodd, A.M.Inst.C.E., for the past five years surveyor to the local board of Southend-on-Sea, was elected.

The town council of Aberdeen had before them on Monday plans by Mr. W. Dyack, burgh surveyor, showing various alternative sites, six in number, proposed for the Woodside public park. A site at Hilton, recommended by the surveyor, was adopted by the council. The park will be about 13-12 acres in extent, and the cost is estimated at £3,200.

The Aberdeen Town Council have adopted plans for the building of a police-court and offices on the site of the prison in Lodge-walk, at an estimated cost of £10,000.

The works in connection with the erection of a new hospital for Halifax, which have been stopped for some time owing to the lack of funds, have been resumed this week, Mr. Justice Chitty having sanctioned the proposal to sell the old infirmary and apply the proceeds to the new structure. The hospital will be on the one-storied pavilion plan, and is being erected from designs by Messrs. Worthington and Elgood, of Manchester, selected in competition. The estimated cost is £60,000, exclusive of site.

At a Consistory Court of London Diocese held on Tuesday, Dr. Tristram granted a faculty for the erection of a memorial external pulpit at the west end of Holy Trinity Church, Marylebone, and also for a baptistery at the south-east angle, and the introduction of the electric light in the same church, at a total outlay of £2,000. The Chancellor remarked that there were now very few open-air pulpits, though both before and after the Reformation they were by no means unknown. The Court, some years ago, gave its sanction to the erection of such a pulpit outside Whitechapel Church, and much good had resulted from that decision. At the same Court faculties were granted to All Hallows Barking to improve the church and to lay out the churchyard as a recreation ground, at an outlay of £3,000; to St. Giles's, Cripplegate, to make alterations at a cost of £1,200; and to Finchley Parish Church, to build a choir vestry at the cost of £300.

Messrs. Reckitt, of Hull, have informed the infirmary authorities in that town that they have agreed to purchase the large hotel at Withernsea, with 3½ acres of garden and grounds, which premises they propose to hand over for the purpose of a convalescent home. The offer has been cordially accepted.

The Metropolitan Asylums Board held a special meeting on Tuesday, when it was agreed to purchase 15 acres of land in Tottenham for the erection of a hospital to accommodate 400 fever cases.

Our Office Table.

We are able to authoritatively contradict the current rumour that it is intended to pull down Crosby Hall, Bishopsgate, for an extension of the Bank of Scotland. No such scheme of demolition is contemplated. The report probably arose from the fact that Crosby Hall Chambers, in the immediate neighbourhood, were recently removed, and are being rebuilt. They contained little of interest; part of an old ceiling was given to the authorities of South Kensington Court, while a fine chimney-piece has been carefully preserved, and will be set up in the new building to be erected on the site from the plans of Mr. William W. Gwyther, of Temple-chambers, E.C.

In the course of operations connected with the regulation of the outflow from Haining Loch, near Selkirk, there has been discovered a subterranean passage, the existence of which was entirely unknown. The subway is 6ft. in height by 2ft. 6in. wide, and its floor is 17ft. above the present level of the loch, and although the water has been lowered, it can never have been so high as this. It is supposed to have been a secret way of escape to the loch either from the Haining Tower, which was occupied by a cadet branch of the Buccleuch Scotts between 1463 and 1625, or, less probably, from Selkirk Castle on the adjoining Peel Hill. In M'Gibbon and Ross's "Castellated and Domestic Architecture of Scotland," reviewed by us last week, there are several references to similar subways, notably one at Yester Castle.

The building of a hospital for Sydney has revealed that the local hospital board and also the New South Wales Parliament have peculiar views as to what constitutes fair play towards professional men. We mentioned in May last that as far back as 1879 the design by Mr. Thomas Rowe, F.R.I.B.A., of Sydney, was adopted for the hospital, and owing to the growth of the city it was subsequently decided to increase the accommodation by 80 beds. The competition designs were thrown overboard, but Mr. Rowe was appointed architect, and instructed to prepare fresh plans, and to change the facing material from brick to stone. In 1888, when £69,000 out of an estimated £140,000 had been expended, a change of Government took place, and the new Ministry stopped the works. After a long discussion in the House, the Government instructed a Mr. Kirkpatrick to complete the undertaking, although his design was not placed in the original competition. The Sydney Hospital Board have since received a claim from Mr. Rowe for £7,000 for commission for the unexecuted works. The board decided to reply, pointing out that as they had paid Mr. Rowe over £3,450, being 5 per cent. on the portion actually built under his supervision, they considered he had been fully remunerated, and it was pointed out that if litigation should arise, it would necessarily be between Mr. Rowe and the Government, who had taken the work out of the hands of the board. Public opinion in the Australian colonies seems, from this and other incidents which have come under our notice, to be on an even lower level than it was in this country before the Competitions Memorial Committee took action fourteen years ago.

The Parisian Academy of Sciences and Arts, Paris, have awarded the First Class Grand Diploma of Honour and Great Gold Medal to Messrs. Baird, Thompson, and Co., the well-known ventilating, sanitary, and heating engineers, of London and Glasgow; and also conferred upon their Mr. J. D. Gray Thompson the title "Membre d'Honneur," this being the highest honour they could bestow in recognition of their latest improved systems of ventilation, heating, and sanitation.

During a gale in the Rhondda Valley, on Tuesday, a portion of the walling of St. Iltyd's Church at Penycraig, now in course of erection, was blown down, causing serious injury to three of the masons—a father and son named James, and another man named Bryant.

Additions are about to be made to the residence of Professor Huxley, F.R.S., in Staveley-road, Eastbourne. Messrs. Waller and Son are the architects, and Mr. J. Harding is the builder.

The name of W. Macie Leir Seaman, of Victoria-mansions, Victoria-street, Westminster, architect, appears in Tuesday's *Gazette* among the receiving orders in bankruptcy.

Trade News.

WAGES MOVEMENTS.

A UNIFORM WAGE FOR MUNICIPAL EMPLOYEES.
—At a meeting held on Sunday afternoon in Regent's Park, under the auspices of the National Union of Masons, Paviers, Settmakers, Quarrymen, and Labourers of Great Britain and Ireland, for the purpose of considering the question of establishing a uniform weekly wage for all municipal and vestry workers throughout the country, the following resolution was passed:—"That this meeting, having heard the statements of the stoneworkers, calls upon all corporations, councils, vestries, and district boards to pay a uniform weekly wage of not less than 42s. to masons and paviers, 33s. to hammermen, and 30s. to labourers; and, further, that they receive the same privilege as the officials—viz., that full pay should be given for Bank Holidays, as well as one week's holiday in the summer; that half-pay be allowed in sickness, and full pay in cases of accidents on the works; and that local bodies should appoint committees to be the courts of appeal for workmen having grievances."

BRISTOL.—The bricklayers' strike has ended, the men having agreed to return to work on condition that they give notice to all branches of the building trades in Bristol for Feb. 28, 1893, of a proposed reduction of hours to 48 in summer and 45½ in winter.

DUNDEE.—The operative painters at present employed in painting the Dundee public schools went out on strike on Monday. The dispute has arisen in connection with the Dundee School Board having accepted a painting contract for several of the schools from an employer who is alleged to be paying his men less than the standard rate of wages.

HUDDERSFIELD.—The operative masons, who came out on strike in July for an increase of 1d. per hour and half an hour off on Saturdays, have obtained the half-hour and an advance of ¼d. per hour, the advance to commence on Monday last. They have consented to an arbitration clause for the settlement of disputes being inserted in the code of rules regulating the trade in Huddersfield.

NEWCASTLE-ON-TYNE.—The builders' labourers in this city have been on strike for some time for an advance of wages and code of working rules. The master builders and contractors reopened their works on Tuesday, and employed labourers who were willing to resume work on the terms offered. Some went in, but a majority still hold out, and are supported in their demands by the local branches of the Operative Bricklayers' Society.

ROCHDALE.—To end the strike among the plasterers, Mr. W. Shepherd, secretary to the Master Builders' Association, recently offered two proposals to the operative plasterers—namely, 8½d. per hour and the old working rules or 8½d. per hour and the working rules as proposed by the masters, which rules include an alteration in place for payment of wages, extension of local boundary, and date of notice for alteration of rules. The men refuse this, demanding an advance of ¼d. per hour, making wages 8½d. per hour, and the old rules. The masters' offer to submit the dispute to arbitration has also been refused by the operatives.

CHIPS.

A new Masonic hall, specially designed by Mr. George Fenton Lambert, architect, of Bridgend and Aberavon, to accommodate the members of the Ogmere Lodge of Freemasons, has recently been opened in the former town. Special attention has been paid to the ventilation, which is carried out on the Boyle system.

The grammar school, Ormskirk, is being warmed and ventilated by means of Shorland's Patent Manchester Grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

A meeting of the joint committees of Ross, Cromartie, and Sutherland County Councils was held on Monday for the consideration of offers for rebuilding Bonar Bridge. It was moved and seconded that the offer by Sir William Arrol and Co., Glasgow, be accepted, to which an amendment was proposed that the offer by Messrs. Abernethy, Aberdeen, be accepted. On going to the vote, a majority voted for Sir William Arrol's offer to rebuild the bridge in ten months for £12,584 17s. The bridge will be in three spans, composed of bowstring steel girders, with a clear waterway of 315ft., being 55ft. longer than Telford's bridge on the same site, destroyed by floods last winter.

A memorial window has recently been placed in the south aisle of Holy Trinity Church, Bear-lane, Leeds. The subjects are "The Presentation in the Temple" and "The Agnus Dei." It is from the studio of Mr. W. G. Taylor, Berners-street, London.

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TENDERS.
 *Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.
BEDFORD.—For the erection of elementary schools, Clapham-road, Bedford, for the Governors of the Harpur Trust. **Mr. Henry Young**, Midland-road, Bedford, architect:—
 Spencer, T. £5,800 0 0
 Haynes, W. 5,375 0 0
 Wharton, J. 5,590 0 0
 White, J. P. 5,557 0 0
 Corby and Son 5,499 0 0
 Foster, S. (accepted) 5,203 0 0

BROMLEY.—For alterations and additions to 10 and 11, Bromley Common, Kent, for **Mr. Christopher Turner**. Messrs. Bushell and Crosier, 22, Great James-street, Bedford-row, W.C., architects:—
 Graham £829 10 0
 Draper 753 10 0
 Taylor and Son, Bromley* 688 10 0
 Roper 489 0 0
 *Accepted with modifications.

CANNING TOWN, E.—For the erection of a block of schools to accommodate 1,570 children, including caretaker's house and cookery room, and inclosing and tarpaving playgrounds situate in Hermit-road, Canning Town, E., for the West Ham School Board. Messrs. J. T. Newman and Jacques, 2, Fen-court, E.C., architects. Quantities by Messrs. R. L. Curtis and Son:—
 Sharpe, G. £19,250 0 0
 Morter, J. 18,762 0 0
 Catley, J. 18,540 0 0
 Hearle and Farrow 18,448 0 0
 Goodechild, G. and G. C. 17,667 0 0
 Greagar and Son 17,634 0 0
 Maddison, W. J.* 16,867 0 0
 *Accepted subject to approval by the Education Department.

CHORLEY.—For the erection of stables (exclusive of fittings) to the Bay Horse Hotel, Whittle-le-Woods, near Chorley. **Mr. T. C. M. Crook**, Old Cross-chambers, King William-street, Blackburn, architect:—
 Sharples and Lupton, Whittle-le-Woods £304 8 0
 (Accepted).

CONWAY.—For the construction of a water main to be attached to the Tubular Bridge for the conveyance of a water supply across Conway Bay, for the joint committee of the Conway town council, Colwyn Bay local board, and the Conway rural sanitary authority. **Mr. Farrington**, of Conway, engineer:—
 Vaughan and Dimont, Newcastle-on-Tyne (accepted).

CROYDON.—For building six shops and 11 premises at George-street, Croydon. **Mr. G. Warren Cooper, M.S.A., F.S.L.**, Bedford Row House, Bedford-row, W.C., architect. Quantities supplied:—
 Longley and Co., Crawley £7,775 0 0
 Peters, L., Horsham 7,900 0 0
 Jelly, W., Wood-green 7,221 0 0
 Taylor, M., Croydon 7,100 0 0
 Triggs, E., Clapham 6,700 0 0
 Mid-Kent Building and Contracting Works, Beckenham 6,687 0 0
 Bullock, A., Croydon 6,585 0 0
 Bullock and Co., Croydon 6,379 0 0
 Wallis and Sons, Maidstone 6,290 0 0
 Saunders, E. J., Croydon* 6,200 0 0
 *Accepted.

EYE, SUFFOLK.—For work to be executed at the corporation farm, for the town council:—
 Day, D., Eye £85 0 0
 Hines, H., Eye 57 0 0
 Skaffham, H., Eye 53 0 0

GRIMSBY.—For the erection of schools for senior girls at Holme Hill, for the School Board:—
 Marrows, W. £3,527 18 0
 Grey and Gooseman 3,519 14 0
 Hewins and Goodhand 3,495 0 0
 Vickers, H., Nottingham 3,476 11 3
 Grant, F., Cleethorpes 3,452 10 5
 Thompson, J. M., & Son (accepted) 3,236 0 0
 Rest of Grimsby.

HOMERTON.—For cleaning, painting, &c., certain wards at the Infirmary, High-street, Homerton, N.E., for the Guardians of the Hackney Union. **Mr. W. A. Finch**, 76, Finsbury-pavement, E.C., architect:—
 Batclior £1,350 0 0
 Lewis 982 0 0
 Barker 782 0 0
 Porter 697 0 0
 Mills 650 0 0
 Flaxman, G., Islington (accepted) 674 0 0
HORSLEYDOWN.—For various repairs, &c., to premises Nos. 1, 2, and 3, Curlew-street, Horsleydown. **Mr. Lawton E. Ford**, St. Thomas' Chambers, London-bridge, S.E., surveyor:—
 Preston, Wm. (accepted) £205 0 0

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Acton Green	Bureauough	Edgware Road	Kentish Town	Monument	South Bromley	Whitechapel	Eastney	ist College	way Place
Aldersgate-street	Junction	Fallsworth	Kilburn	Newcastle	South Kensington	Whitefield	Fleetwood	Battersea, St. Sutton	
Aldgate	Bury	Farrington	Kiloby	under-Lyme	Speke	Widnes	Fulwood	Mary's Church St. Jude's	
Althorp Park	Borough Road	Fenchurch	King William	New Cross	Spring Grove	Willenhall	Hamilton, Glas-	Birmingham, Tayport	
Altrincham	Mersey Tunnel	Street	Street	Newport	Stechford	Bridge	gow	Cowper Street	Torrington
Aston	Canonbury	Finchley Road	Langley Green	Newton Heath	Stepney	Williesden	Hulme	Clapham	Upton Cross
Ash Street,	Camden Road	Firsby	Latimer Road	North Brentford	Stoke	Wood Green	Knightsbridge	Colchester	Wandsworth
Stockport	Chalk Farm	Forest Gate	Lea Bridge	North Bridge	Stourbridge	Wormwood	Leicester, Glen	Forest Gate	
Birmingham,	Charing Cross	Forest Road	Leamington	Northampton	Stratford	Scrubbs	Parva	Hanway Place	Hospitals.
New Street	Cheddington	Level Crossing	Leyland	(Castle Station)	Stretford	Worsley	Manchester	Harrow	Belfast County
Banbury	Cheetham Hill	Fulham	Leyton	Nottingham	Sudbury	Wolverhampton	Newbridge	Haverstock Hill	Lunatic Asy-
Barnsley	Junction	Geedley	Leytonstone	Oldbury	Sunderland	Wolverton	Newcastle-on-	Orphan Work-	lum
Barnsley	Chequerbent	Gloucester Road	Oldham (Mumps)	Old Ford	Sutton	Barracks.	Tyne	ing School	Greenwich In-
Batley	Clayton	Gower Street	Paddington	Oldham (Mumps)	Sutton Coldfield	Aldershot	Normanton	Jamaica Level	firmway
Bedminster	Clifton	Grantham	Parsons Green	Oldham (Mumps)	Temple	Ashton-under-	Northampton	Leyton, Gram-Guy's Hospital	
Bescot Junction	Clietheroe	Greenwich	Patricroft	Oldham (Mumps)	Thornton	Lyne	Norwich	mar School	Lincolphshire
Birmingham	Crewe	Hackney	Penzance	Oldham (Mumps)	Torquay	Barnet	Portsmouth	Leyton, Church County Asylum	
Bishopsgate	Crooked Billet	Haggerston	Pickle Bridge	Oldham (Mumps)	Tower of London	Belfast	Preston	Road	Middlesex
Blackfriars	Level Crossing	Hammersmith	Plastow	Oldham (Mumps)	Tring	Budbrook	Regent's Park	Newhaven	County Lunatic
Blackfriars	Cross Lane	Heaton Park	Pleek	Oldham (Mumps)	Tynemouth	Burnley	Salford	Old Ford	Asylum
Bridge	Crumpsall	Hereford, Barr's	Plymouth	Oldham (Mumps)	Upton Park	Caterham	Shorncliffe	Poplar, Byron & Peterborough	
Blake Street, Sut-	Cullercoats	Court	Portsmouth	Oldham (Mumps)	Victoria	Chatham	Trim	Bright Streets	Infirmary
ton Coldfield	Cannon Street	Highbury	Presthwich	Oldham (Mumps)	Walham Green	Chester	Warley	Southsea,	Rubery Asylum,
Blaydon-on-Tyne	Dalston	Highdran Road,	Radcliffe	Oldham (Mumps)	Walsall	Coventry	Winchester	Church Path	Northfield
Blethley	Daubhill	Wallsend	Road	Oldham (Mumps)	Walsall	Curragh Camp	Woolwich	Southsea, Omega St. Thomas'	
Bolton	Daybrook	Hollinwood	Salisbury Road	Oldham (Mumps)	Walsall	Dublin, Beggar's	Wrexham	Street	Hospital
Bolts Bridge	Denholme	Holyhead	Seething Lane	Oldham (Mumps)	Walsall	Bush			
Bombay, India	Derby	Homerton	Shedwell	Oldham (Mumps)	Walsall	Dublin, Island			
Bow	Dryolesden	Horley	Shoreditch	Oldham (Mumps)	Walsall	Bridge			
Bowdon Central	Drighlington	Hounslow	Sloane Square	Oldham (Mumps)	Walsall	Dublin, Old-			
Brick Lane	Dudley	Hounsflow Bar-	Snow Hill, Bir-	Oldham (Mumps)	Walsall	Dublin, Street			
Bristol	Dudley Port	racks	mainham	Oldham (Mumps)	Walsall	Dublin Royal			
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For the erection of the bathing boxes and screens:—	
Borrett, Chas. (accepted) ...	£170 0 0

IPSWICH.—For the reconstruction of Handford Bridge, London-road, for the corporation:—

Girling and Coe, Ipswich (accepted) ...	£2,565
(Lowest of seven tenders received.)	

LEAMINGTON.—For making a road at the rear of Euston place, for the town council:—

Jenkins and Son ...	£248 0 0
Smith and Sons (accepted) ...	163 0 0

LONDON.—For alterations at No. 23, Budge-row, E.C. for Messrs. English and Son. Messrs. F. Chambers and Son, College Hill, E.C., architects:—

Greenwood, J. ...	£685 0 0
Grover and Son ...	665 0 0
Hall, Beddall, and Co. ...	650 0 0
Laurence and Son ...	652 0 0
Smith, W. H. ...	597 16 0
Newin Bros. and Co. (accepted) ...	594 0 0

LONDON.—For the erection of new parish hall and library, for the trustees of the St. Mary-le-Strand Freehold Estate Charity in Drury-lane, W.C. Mr. Albert Vicars, Somerset Chambers, 161, Strand, architect:—

A.	B.	C.
Grover and Sons £4,970 ...	£263 0 0	£5,233 0 0
Patman & Fotheringham ...	4,760 ...	225 0 0
Charteris ...	4,450 ...	198 0 0
Shillito ...	4,440 ...	222 0 0
Dove Bros. ...	4,395 ...	215 0 0
Heath ...	4,220 ...	142 11 0
Ashby Bros. ...	4,219 ...	238 0 0
Adamson and Sons ...	4,098 ...	225 0 0
Pattinson ...	4,081 ...	240 0 0
Macey and Sons ...	4,075 ...	204 0 0
A.—General contract.	B.—Supplemental estimates.	C.—Total.

LONDON.—For the supply and erection of the constructional ironwork for the Meredith's Wharf depot of the City of London Electric Lighting Co., Ltd. Major-General Webber, C.B., and Colonel Seddon, engineers:—

Peirson & Co., Fenchurch-street (accepted) ...	£2,896
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LONDON.—For the erection of huts at the North Western Hospital, Havestock Hill. Messrs. Pennington and Bridgen, architects:—

Wall, H., and Co., Carlton Works, Kentish Town (accepted) ...	£3,459 0 0
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LONDON.—For the erection of huts, nurse's room, &c., at the Northern Hospital, Winchmore Hill. Messrs. Pennington and Bridgen, architects:—

Todd ...	£945 0 0
Leslie ...	8,297 0 0
Brass and Son ...	7,910 0 0
Shurmer ...	7,514 0 0
Kirk and Randall ...	7,466 0 0

[The above appeared in your last week's issue, but, we are informed, was by mistake given Charles Wall and Co., and is causing confusion.]

LONDON.—For sundry works in extending the Bayswater Jewish Mixed Schools. Messrs. N. S. Joseph and Smithem, 45, Finsbury-pavement, E.C., architects:—

S. Barnett (accepted) ...	£950 0 0
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LONDON.—For decorative work at No. 21, Pembridge-villas, Baywater. Messrs. N. S. Joseph and Smithem, 45, Finsbury-pavement, architects:—

Dagnall, J. ...	£299 13 0
Barnett, S. ...	585 0 0
Hanks, H. (accepted) ...	213 0 0

LONDON.—For sundry structural works at 15, Hyde Park-square, W. Messrs. N. S. Joseph and Smithem, 45, Finsbury-pavement, E.C., architects:—

Vare Bros. (accepted) ...	£247 0 0
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NEWPORT, MON.—For the erection of a gas receiver for the town council:—

Walker and Co., London (accepted) ...	£6,600 0 0
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[A Newport builder's tender of £10,100 has been accepted for the gas tank.]

MILL HILL.—For Wesleyan chapel and school, Mill-hill, N. Messrs. Isitt and Adkin, architects:—

Woodhall, J. W., Whetstone ...	£1,764 2 0
Chessum and Son, Haggerston ...	1,386 0 0
Crewe, W., Stamford-hill ...	1,340 0 0
Windebank and Co., Balham ...	1,180 0 0
Houghton and Son, Stroud Green ...	1,132 0 0
Otway, J., Chislehurst ...	1,139 0 0
Tout, W., Hendon ...	1,095 0 0
Gosdon and Sons, Kilburn ...	1,073 0 0
Inwood, J., Finsbury Park ...	1,073 0 0
Sharpe and Son, Amptill ...	1,035 0 0
Dove, H. M., Watford ...	1,069 0 0
Martin and Co., Croydon ...	1,023 0 0

* Accepted.
NORTHAMPTON.—For villa, Dallington Park, Northampton, for Mr. A. J. Cooper. Mr. Samuel J. Newman, Northampton, architect:—

Archer, E. ...	£956 0 0
Green Bros. (accepted) ...	926 0 0

Both of Northampton.
PADDINGTON.—For repairs and painting at the infirmary, for the guardians of the poor. Messrs. A. and D. Harston, architects:—

Stokes and Co. ...	£1,317 0 0
Jenner ...	753 0 0
Batchelor ...	687 15 0
Matthews Bros. ...	670 0 0
Haider and Edge ...	663 10 0
Prout ...	630 0 0
Foxley, G., King-street, W.*	572 12 6

* Accepted.
St. LEONARD'S-ON-SEA.—For the erection of three houses and shops in the Norman-road. Messrs. Elworthy and Son, architects. Quantities by the architects:—

Snow, D. H. ...	£3,004 0 0
Hughes, C. ...	2,996 0 0
Salter, T. ...	2,954 0 0
Taylor Bros. ...	2,950 0 0
Moon and Garner ...	2,950 0 0
White, A. H. ...	2,945 0 0
Elridge and Crutenden ...	2,921 0 0
Lester, J. ...	2,920 0 0
Crutenden, H. E. ...	2,889 0 0
Jenkins, P. ...	2,866 0 0
Morgan, W. (accepted) ...	2,840 0 0

Architects' estimate, £2,875.
SEVENOAKS.—For the erection and fitting of new boiler, for the board of guardians:—

Appleby Bros. 22 Walbrook ...	£275 0 0
Murdoch and Cameron ...	237 0 0
Fraser, W. J., and Co., London ...	229 0 0
Somerscales & Son, Keeley ...	225 0 0
Harper Twelvethrees, Cherrytree, Lancashire ...	220 0 0
Gardner & Co., Maidstone ...	215 0 0
Dann, Invicta Works, Maidstone ...	210 0 0
Dawson, R., & Co., Stalybridge ...	210 0 0
Braitwaite, J., and Son, Kendal ...	218 0 0
Benham and Son, Wigmore-street ...	199 0 0
May, H. F., High Holborn ...	195 0 0
Jones, P. S., Rye ...	198 12 0
Freeman, W. S., Otford ...	159 0 0
Sibley, J., Westerham (accepted) ...	139 0 0

SOUTHWARK.—For rebuilding premises Nos. 20 and 22, St. George's-road, S.E. for Messrs. Paul and Son. Mr. Lawton R. Ford, St. Thomas's Chambers, London Bridge, S.E., architect:—

Peacock, A. ...	£1,594 0 0
Russell, W. F. ...	1,589 0 0
Williams, H. J. ...	1,587 0 0
Johnson, W., and Co., Ltd. ...	1,575 0 0
Bullers, J. ...	1,550 0 0
White, A., and Co. ...	1,519 0 0
Canning and Mullin ...	1,470 0 0
Downs, W. ...	1,424 0 0
Battley, R. G. (accepted) ...	1,420 0 0

St. HELEN'S.—For the erection of a boat-house at Carr Mill Dam, for Col. D. Gamble, C.B. Mr. W. Wallace Gandy, St. Helen's, architect:—

Davies, R. H. ...	£450 0 0
Harrison, W. ...	435 0 0
Beckett, S. (accepted) ...	415 0 0

All of St. Helen's.
TONBRIDGE.—For an iron fence at the workhouse grounds, for the board of guardians:—

Bayliss, Wolverhampton (accepted) ...	£288 0 0
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Lowest tender received.

STRATFORD, E.—For the erection of a block of stables, store, and slaughter-house, situate in Maryland-road, Stratford New Town, E., for the Stratford Co-operative and Industrial Society, Ltd. Messrs. J. T. Newman and Jacques, 2, Fen-court, E.C., architects. Quantities by Messrs. R. L. Curtis and Sons:—

Catley, J. ...	£5,780 0 0
Mortier, J. ...	5,538 0 0
Maddison, W. J. ...	5,770 0 0
Gregar and Son ...	5,353 0 0
Co-operative Builders ...	5,112 0 0
Sharpe, G. (accepted) ...	5,001 0 0
Hearle and Farrow ...	4,998 0 0
Castle and Co. ...	4,932 0 0

Ironwork:—
Lindsay ... 1,465 0 0
Durham and Co. ... 1,470 0 0
Jones, W. (accepted) ... 1,265 0 0

TAUNTON.—For reconstruction of iron and glass roof, Pool Wall Mills, for the Taunton Manufacturing Company. Mr. E. W. Roberts, M.S.A., 2, Hammet-street, Taunton, architect:—

Spiller, H. J., Taunton (accepted) ...	£326 0 0
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WALTHAMSTOW.—For the erection of a detached house in the Upper Walthamstow-road, Wood-street, for Mr. J. E. Watts. Mr. W. A. Finch, 76, Finsbury-pavement, E.C., architect:—

Mollett, J. H. ...	£1,618 0 0
Holland, J. ...	1,638 0 0
Thomerson and Son ...	1,492 0 0
Godfrey and Son ...	1,370 0 0
Beale, G. W. ...	1,269 0 0
Porter, A., Tottenham* ...	1,197 0 0
Porter, A., Tottenham* ...	1,000 0 0

* Original estimate. + Amended estimate (accepted).

WHITECHAPEL.—For the erection of warehouses in Bucks-row, Whitechapel, E., for Messrs. S. Schneider and Son. Messrs. Wigg, Oliver, and Hudson, 7, Bedford-row, and 89, Leman-street, E., architects. Quantities by Messrs. Franklin and Andrews:—

Hearle and Farrow ...	£17,999 0 0
Little, T. ...	17,210 0 0
Bywaters, G. H. and A. ...	18,600 0 0
Battley ...	18,379 0 0
Laurence, E., and Sons ...	16,922 0 0
Holloway Bros. ...	15,776 0 0
Mowlem, J., and Co. ...	15,637 0 0
Scrivener, W., and Co. ...	15,138 0 0
Patrick, M., and Son ...	15,192 0 0
Gladling, W. ...	14,972 0 0
Sparks, J. ...	14,875 0 0
Perry and Co. ...	14,700 0 0
Harris and Wardrop ...	14,697 0 0
Brown, J., Son and Blomfield ...	14,500 0 0
Bentley, J. ...	14,490 0 0
Brass, W., and Son ...	14,444 0 0
Richardson, J. O. ...	14,389 0 0
Garlick and Horton, Limited ...	13,300 0 0

YARDLEY, BIRMINGHAM.—For the erection of a school at Hall Green, for the Yardley School Board:—

Harley, J., and Son (accepted) ...	£2,654 0 0
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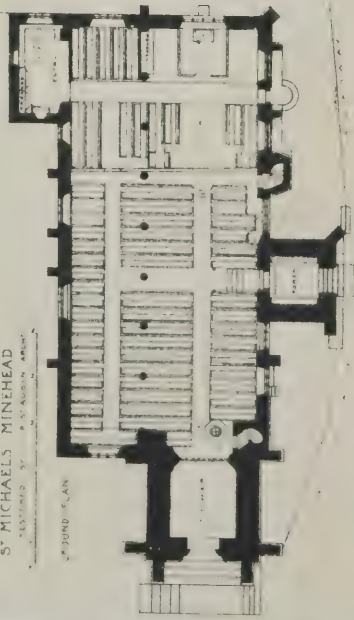
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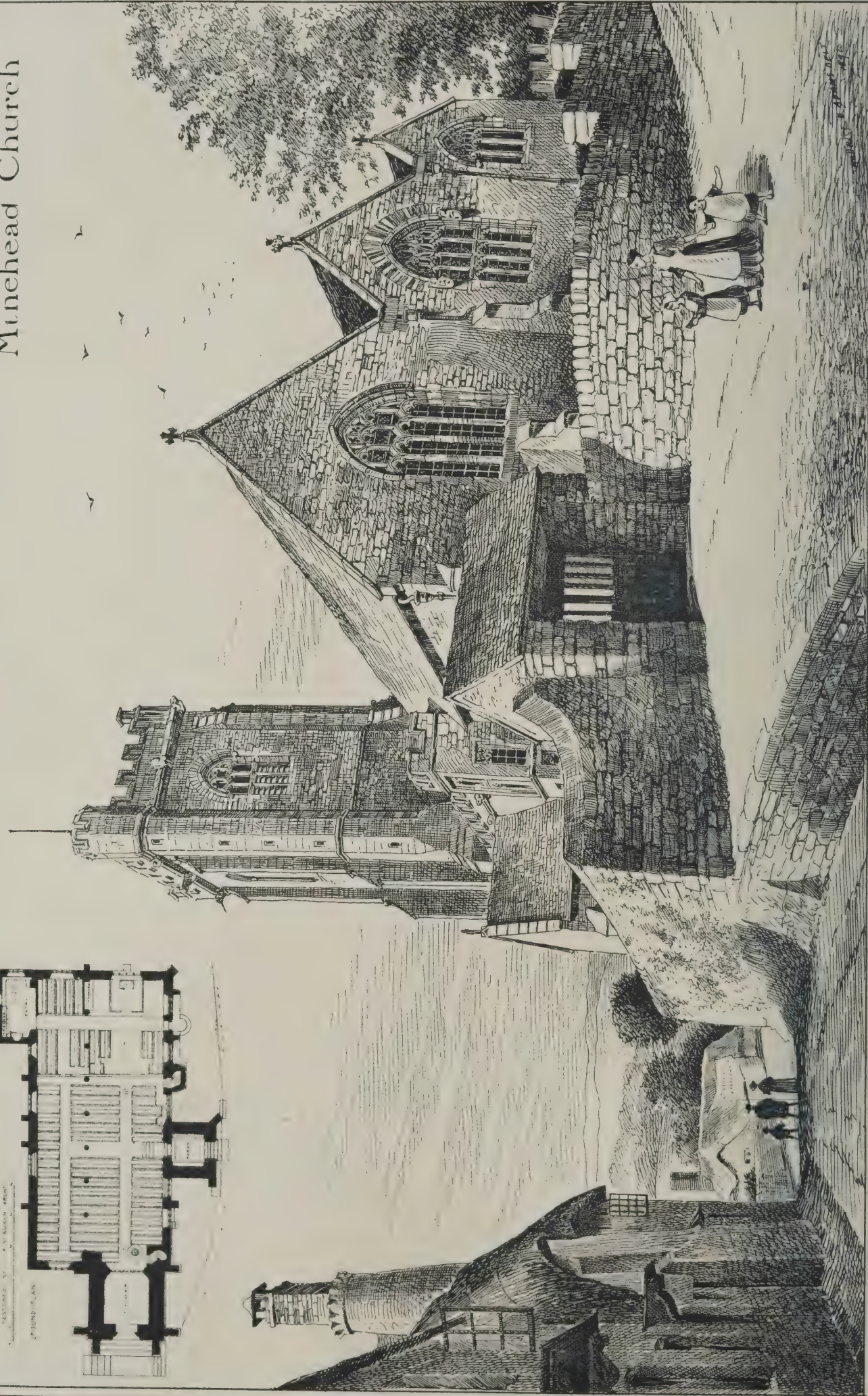
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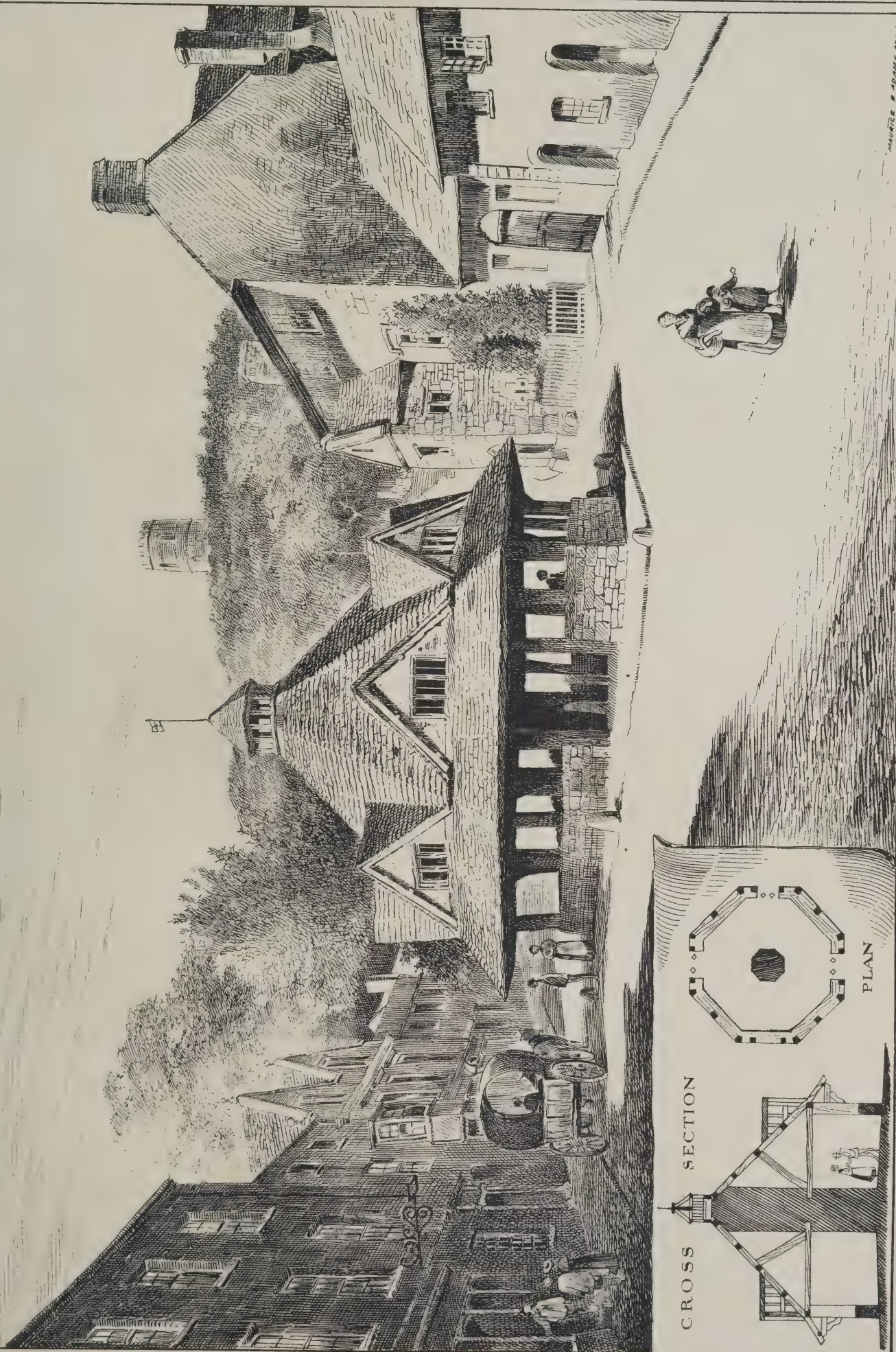
GROUND PLAN



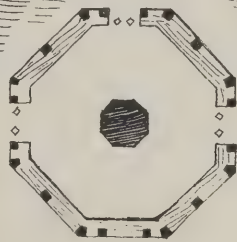
Minehead Church



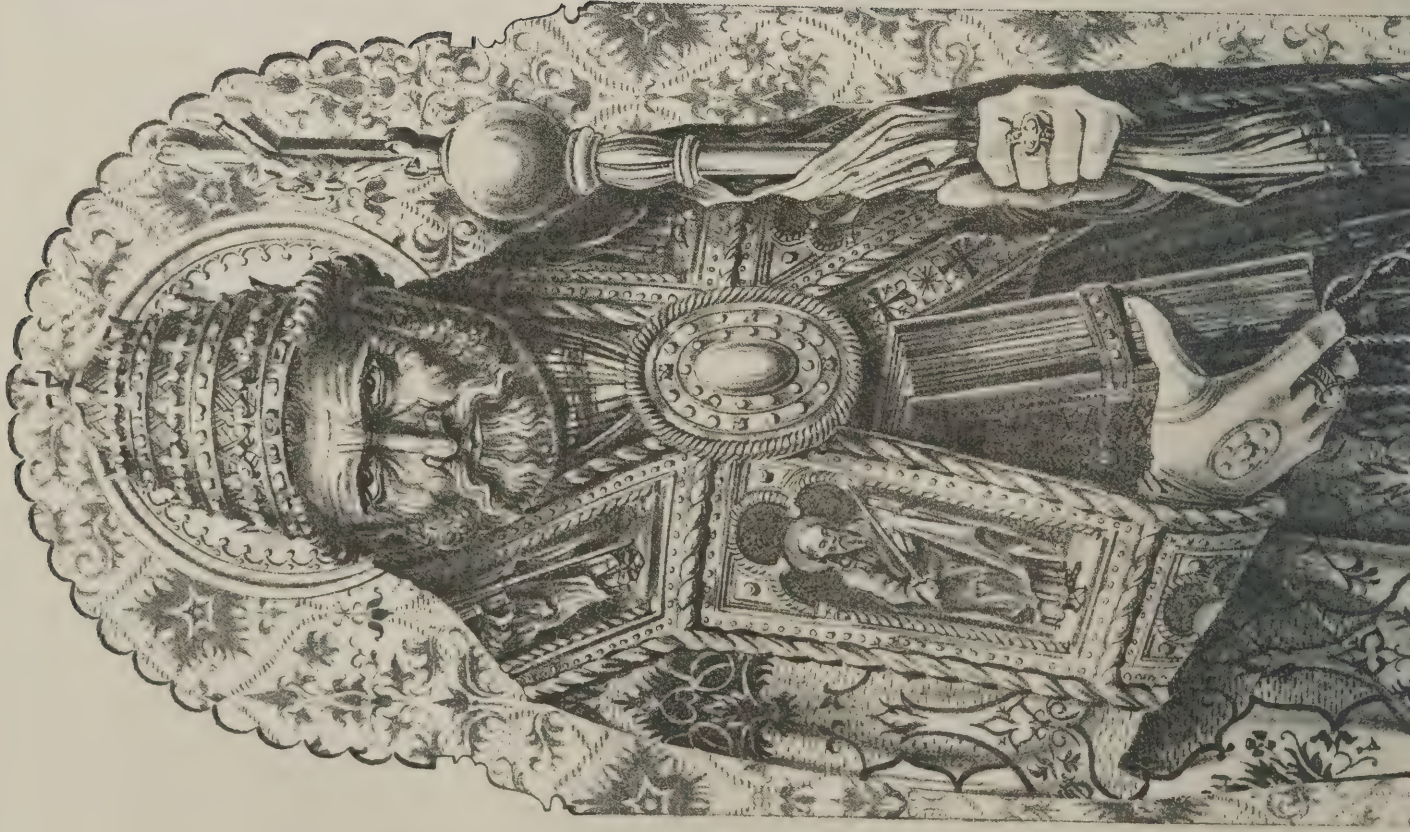
MARKET HOUSE AT DUNSTER



CROSS SECTION



PLAN





ST PETER.

ALTAR-PIECE BY CARLO CRIVELLI



ST CATHERINE.

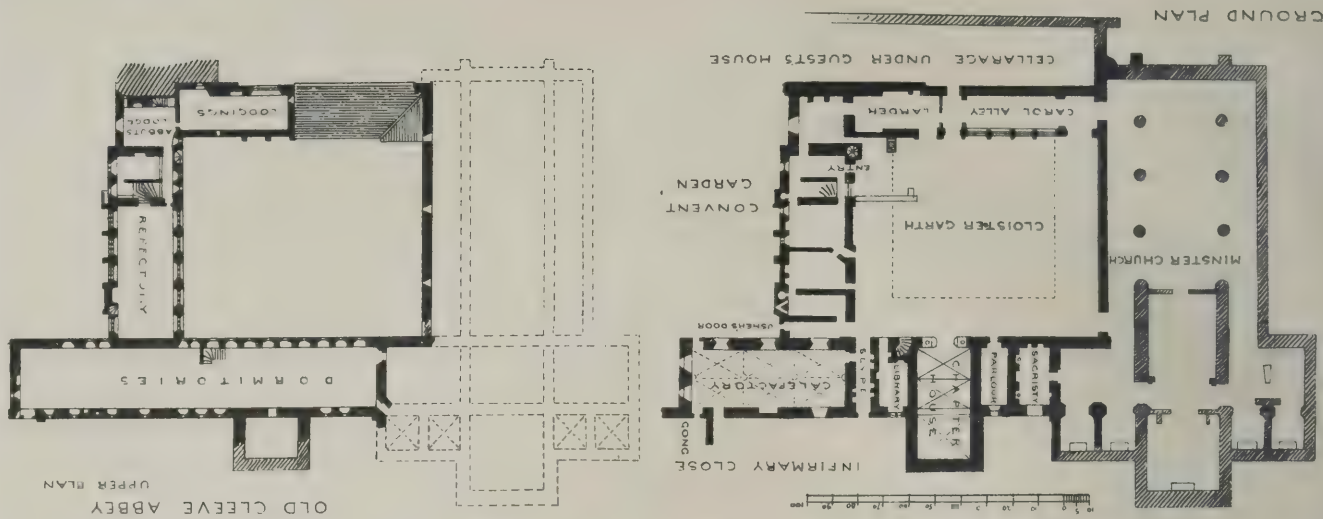
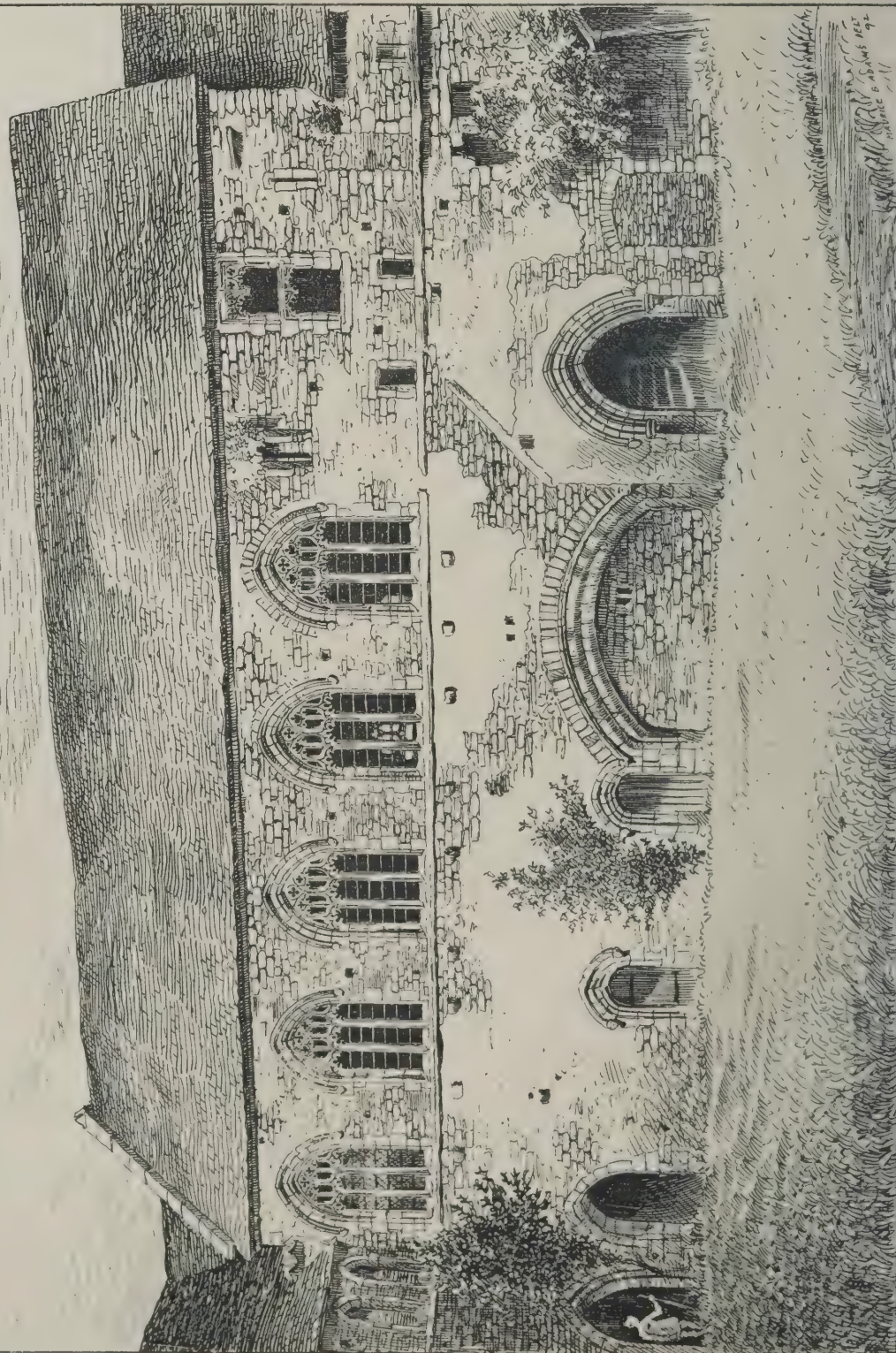
DRAWN BY W. SWEATHERLY.

THE BUILDING PEWS, AUG. 19, 1892.





Old Cleeve Abbey SOMERSET



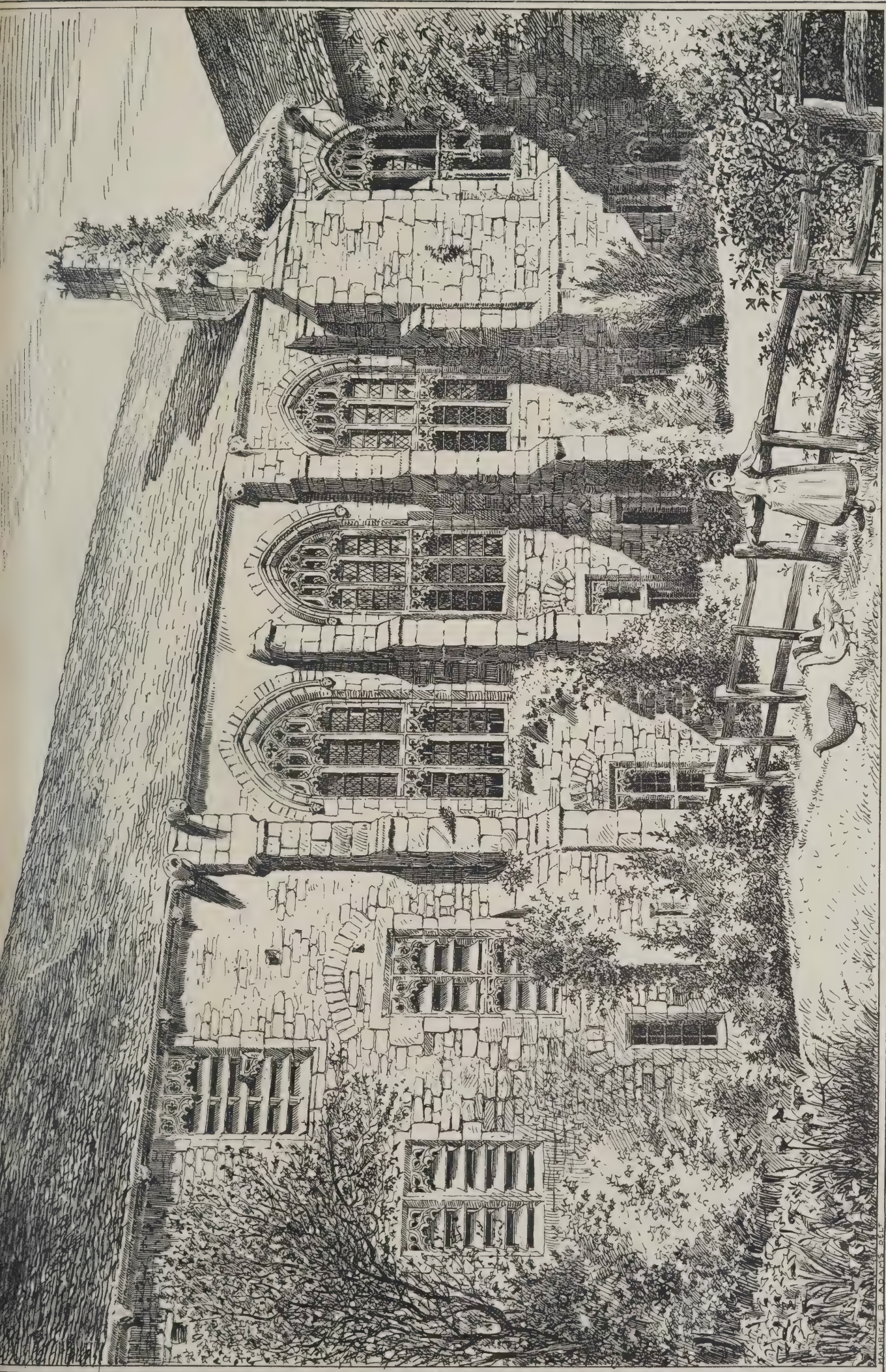


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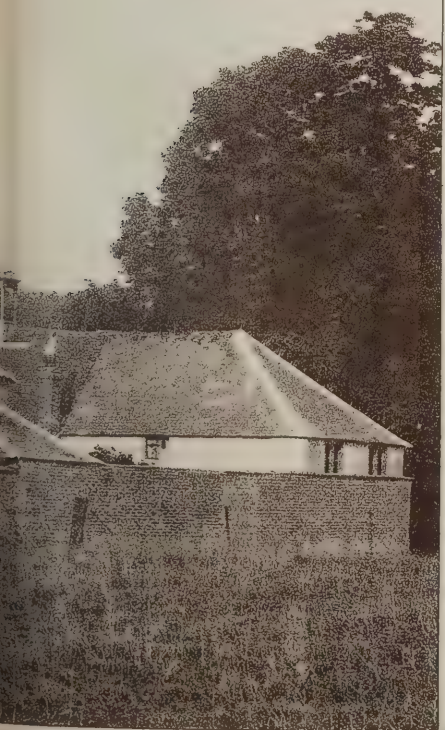
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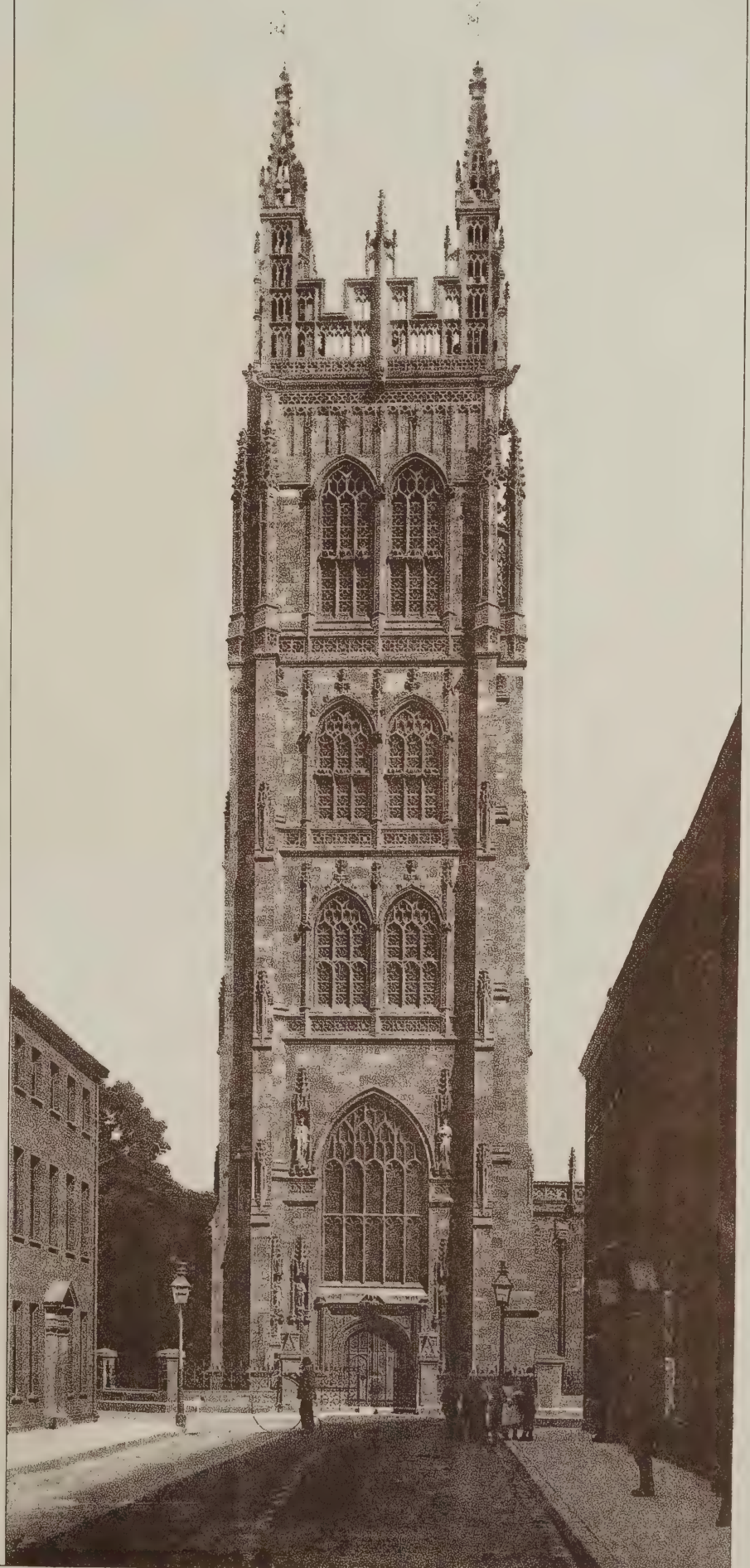
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THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1964.

FRIDAY, AUGUST 26, 1892.

THE REPORT OF THE SELECT COMMITTEE ON THEATRES.

IT is exceedingly doubtful if the majority of our readers are acquainted with the circumstances which gave rise to the inquiry which was made during the months of March, April, and May last year by a Select Committee of the House of Commons into the operations of Acts of Parliament relating to the licensing and regulation of theatres and places of public entertainment. Since the London County Council have taken up the duties of the late Metropolitan Board of Works, they have been striving to acquire further powers than those conferred on them by the Metropolitan Management and Building Acts Amendment Act, 1878, Sections XI., XII., and XIII., and for that reason have from time to time endeavoured to have Bills passed by Parliament giving them the entire licensing and control of all places of public entertainment within the County of London. The last Bill before the House—that of 1891—was blocked, and the Council obtained the consent of the House to the inquiry of a Select Committee. The report of this committee has just been published in the form of a Parliamentary blue-book, and as there are many matters referred to therein of vast importance to the architect, we purpose reviewing the contents of this volume for the information of our readers.

In the year 1877 a Select Committee of the House of Commons held an inquiry, under the presidency of Sir H. Selwin Ebbeson (now Lord Rookwood) into the management of the Metropolitan Fire Brigade. This committee recommended that no new theatre or music-hall in London should be finally licensed until the Metropolitan Board of Works had certified that in respect of position and structure it satisfied all due requirements for protection against fire; it also advised that the Board should have power to call upon the owners of existing theatres and halls to remedy such structural defects as might appear to be a cause of special danger, and capable of being remedied at a moderate expense. Acting upon these recommendations, the late Board introduced and passed the amendment to the Building Act above mentioned, which gives the present Council their authority over places of public resort; and the passing of the Local Management Act in 1888 placed the licensing of music-halls and certain theatres in the hands of the Council.

The chief objects of the Bill of 1891 were to codify the existing law applicable to theatres and music-halls; to adapt the same laws to theatres and music-halls so far as it was possible to do so; to give the Council power to insist that buildings used for public entertainments should be structurally fit for the purposes intended, and that they should be kept so; and to compel the proprietors to take the precautionary measures necessary for the protection of the public from fire and accident.

It is requisite, before considering the important evidence given before the Select Committee this year, to understand fully what provisions the Council's Bill made as to structural matters, which alone affect the architect, leaving out of the question all matters relating to management and supervision of morals. Referring, then, to the structural part of the Bill, it was proposed that the provisions contained in the Acts of 1878 and 1882 (41, 42 Vic. c. 32; 45 Vic. c. lvi.) should be re-enacted; but as these

powers were contended by the Council to be insufficient in practice, on the grounds that the structural alterations thereby permitted must be limited to such as can be carried out at a moderate cost, and also because the Council have no power to inspect a theatre or music-hall day by day if necessary—it was proposed to confer power upon the Council to make annual or more frequent inspections, and to insist on alterations being done if deemed necessary for the protection of the public safety. The right of appeal to the Home Secretary, which now exists, was retained, and no place was to be allowed to be kept open unless duly certified as to its structural stability, security against fire, and facility of ingress and egress.

The Bill further provided for the Council to retain the power to frame regulations for insuring the safety and accommodation of the public, and to appoint inspectors for the purpose of seeing that the arrangements made for the public safety were properly maintained, and that rules for insuring order and decency were observed, as well as regulations relating to means of exit, provision of fire appliances, and subsidiary lighting of the passages by oil lamps in the event of the extinction of the gas or electric light.

Further provisions were made for the control over the manner in which the audience should be disposed in the building, and the number of persons that should be admitted, and that no alteration in the position on plan of the fixed seats should be made until plans of such alteration had been submitted to, and approved by, the Council. A clause was inserted forbidding the blocking of gangways.

The Bill also referred to the payment of costs of structural alterations. The owner was to be liable in the first instance, but he was to give notice of the requirements to the reversioner, and both were allowed the right of appeal, and charged by way of annuity on the premises, the apparent object of which provision was to allow a fair method of dealing with such charges, as the costs, it has been stated, often fall upon a person who has but a short term, and the object was to throw the expense upon the person who is permanently benefited. The occupier for the time being would have to pay the rent-charge, but in return for this would be exonerated from the capital expenditure, which he would otherwise be liable for if the owner refused to do the work, unless, indeed, he preferred to close the premises.

This Bill further asked for powers to enable the Council to insist that all licensed premises should be kept in a fit and proper sanitary condition. Such were the main provisions which concerned the architect, and on the evidence on these points alone we now wish to deal.

Mr. T. G. Fardell, who was Chairman of the Theatres and Music-halls Committee of the Council for three years, gave very detailed evidence, explaining the provisions of the 1891 Bill, as well as of the other measures, which both the late Board and the Council had tried to make law. Mr. Fardell showed, in replying to the many questions put to him, an intimate knowledge not only of the various laws and enactments at present governing places of public entertainment, but a practical acquaintance of the requirements for public safety in theatres, &c., that could scarcely have been expected from a layman. It is evident proof that during the term of his chairmanship he had studied the subject from practical grounds. After a full recital of the present law, this gentleman explained that the Council had not sufficient power in structural matters, on account of the restriction imposed by the present Act of 1878 that only such alterations can be insisted upon as can be executed at a "moderate expense," because it had been found in practice that very large expenditure had at times been necessary to make the

place at all compatible with public safety, and it was mentioned as an example that the proprietors of the Gaiety Theatre had expended £8,000 to meet the requirements of the Council. Mr. Fardell paid high tribute to the lessee of this theatre and of the Lyceum for the manner in which the proprietors of these theatres had given the Council every assistance in providing for the public safety, and he said, "If the proprietors had relied upon the provisions of the Act, that everything should be carried out which only involved a reasonable expense, I take it that there might have been very considerable difficulty on the part of the Council in forcing them to do it. The only way it could have been done was by the Council approaching the Lord Chamberlain, and asking him to use his influence and power of refusing a license, without giving any reason whatever, to these two theatres"—an extreme course, we should humbly submit, most unlikely for his lordship to take.

The next point of importance put forth by this witness was his desirability for the appointment of a standing arbitrator to decide any disputes arising as to structural matters between the Council and the proprietors, so as to insure continuity of practice and authority, and that one person might not decide in one way and another in another. It was then explained that originally the Council was desirous of having the licensing of all theatres now licensed by the Lord Chamberlain; but that was one of the points upon which the Council gave way at the request of the proprietors and lessees of theatres. This claim, it appears, was put forward because the Select Committee of the House of Commons of 1866 were of opinion that all licensing should be by one authority. He explained that, "Under the Act of 1878 a theatre is licensed by the Lord Chamberlain; the County Council, as successors to the Board of Works, will have the right to inspect it for structural alterations and requirements; certain alterations may be deemed necessary, and, by permission of the Lord Chamberlain, they can call upon the owner to carry them out. The owner appeals against the order which will then be served, and the Chief Commissioner of Works will have to appoint an arbitrator, so that there you get three authorities. There is the licensing authority, the supervising authority, and another authority who is over the two. We say that is not right, but that the licensing authority should be the one to see that everything is in order." So far as these last words go, we most heartily agree with Mr. Fardell, for it seems but just that the proprietors should have but one authority to deal with. Whether that authority should be the Lord Chamberlain, the Council, or the Home Office, we do not attempt to say.

Speaking next of music-halls of the smaller class, which exist in the rear of public-houses, the witness drew the attention of the committee to the conflicting requirements of the licensing magistrates and the Council. We quote again from the evidence: "Now, for instance, at the October Session of 1890, I think it was, we had a man before us applying for a license for music and dancing, and we suggested, as a condition of giving him the license, that he should make certain alterations. I believe they were in process of negotiation at the time; no real objection was made. We heard from him the following December that he was not in a position to do anything till the following March, when the justices met."

The question of the desirability of placing open-air shows and fairs under the Council's license was next dealt with.

There has always appeared to our mind great and unnecessary inconvenience to licensees in the inability of obtaining a license except at a fixed time (October) once a year. Suppose applicants fail to apply in October,

and their plans are not ready, or even matured, and they want to open the place to the public in the following spring or summer, as in the cases of exhibitions, then they have to postpone their "show" for twelve months and lose a whole year's takings. In the case of the Military Exhibition, the authorities did not apply for a license till the following spring, as it did not occur to them before that they would need a music license. They could not, of course, obtain one, and but for the power conferred on the Secretary of State, both that important exhibition and the Naval Exhibition would have been without music. Music licenses, like dramatic licenses, should be obtainable at any period of the year.

The desirability of improvement in the sanitation of our public buildings must be admitted on all hands, and Mr. Fardell argued that the clause relative to this was probably one of the most important alterations proposed in the Bill. He referred to Mr. Lennox Browne's paper on this subject read before the Congress of Hygiene last year, a full report of which appeared at the time in the *BUILDING NEWS*, in which the inadequate provision for dressing-rooms and the faulty situation and defects of the sanitary arrangements of many well-known theatres were described and illustrated. The lack of ventilation to rooms behind the scenes, the carelessness of *employés* in matters of sanitation, and other points were dwelt upon.

The importance of Mr. Fardell's evidence cannot be overlooked, as although the Council have failed to obtain what they asked for, up to the present, there can scarcely be any doubt but that it is only a matter of time when this will become a part of the London Programme of the Progressive Party in the House of Commons. In the present Commons this party is fairly represented, and there is more chance now for a new Theatres Bill for London than there was six months ago. Therefore we think it necessary to fully consider and carefully weigh all the points of this evidence, as Mr. Fardell, in spite of his Conservative political views, is the father of the Progressive Theatre Bill.

The next point considered by the Select Committee was as to the continuance of requisitions, year by year, being served upon the proprietors; and the witness said that in his opinion, upon a certificate of the superintending architect of his Council that all the works required by the Council had been done, the licensee should not be called upon to do anything more for five years. This appears to us a fair measure, for, provided no unauthorised alterations were made, if his works were really thoroughly done in the first instance they would never require re-doing. One thing, however, was observed, that the advance of modern ideas might introduce unthought-of improvements, and new demands might accrue therefrom, which is perfectly feasible.

Attention was next drawn to the fact that frequently after plans are approved deviations are made; but all architects know how that, in carrying out works, alterations from the original plans are at times necessary. It would appear that the Council require notification of such alterations for their consideration, and this is a point that architects having dealings with the Council should bear in mind. The licensing of a building to hold a fixed number is a self-evident provision for the benefit of the public themselves, as it obviates the evils of crowding and the obstruction and blocking of exits and gangways. How the managers would look upon this is not a matter which need concern us here. These and such-like provisions for safety should be enforced in all places where the public assemble, whether theatre, music-hall, lecture-room, church, chapel, or other place of public meeting or resort. Mr. Fardell pointed out that the

object of restriction in regard to the alteration of fixed seats is that it occasionally happens that a large number of seats are added, which materially obstruct the means of egress and ingress, and he further argued as to the desirability of allowing only a certain number of persons in a certain area at a certain time.

He further described from his personal knowledge buildings he had visited in his official capacity as Chairman of the Theatre Committee, and showed a detailed acquaintance with the arrangements. The whole of the evidence may be summed up in the reply to the questions as to placing the licensing under one authority. "Personally," said Mr. Fardell, "my own view is that there should be only one licensing authority for theatres and music-halls, and that everything, both structural and licensing, should be under one authority." We fully concur with the opinions expressed of the desirability of extending jurisdiction to all public buildings, whether licensed or not, for public safety is as important in a church as in a music-hall, as examples of disasters occurring in unlicensed premises are numerous, and our readers will remember the fatal catastrophe at the Hebrew Dramatic Club, Spitalfields.

Mr. Fladgate, who gave evidence on behalf of the theatrical managers, objected to the Council being the licensing body, because it was a fluctuating body of an elective kind, which might be affected by changes of popular feeling. Granting this, it must not be lost sight of that, although the members of the Council may come and go, the officers and advisers remain. The desirability of a State department controlling all the theatres in the country as well as those in London was argued, as the regulations of one town do not agree with the rules of another, and architects who are not local men find difficulty in complying with the provisions of the various authorities. One common authority for the whole land certainly appears to be a most desirable enactment.

Mr. Irving pointed out the desirability of the technical knowledge required by architects who inspect and report upon theatres, and while some witnesses complained of the lack of technical training in the superintending architect's department of the Council, others spoke highly of the abilities of the architect himself, Mr. Blashill, who had acquired considerable celebrity in the profession long before he was appointed architect to the Council, and of the technical knowledge of his assistant, Mr. Woodrow, who, Mr. Fardell explained, was trained under an architect very well known in London in connection with theatres, and who was also the author of several papers on the subject.*

It does not seem to us necessary in this *résumé* of the Select Committee report to dwell upon that part of the evidence given by Mr. Blashill respecting the *modus operandi* adopted by him and his staff in making inspections of, and reporting upon, the internal arrangements of the various places of amusement in the Metropolis. It was stated that the disposition of the Council was to relax rather than to increase the stringency of any of the requirements set forth in the superintending architect's reports. One statement of Mr. Blashill's we should not pass over, which referred to the fact that the seating accommodation of the various music-halls has been reduced by 77,000, owing, in a great measure, to the inability of the proprietors of unsafe buildings to comply with the requirements of the architect's department. This, we take it, is a strong proof that the safety of the public receives every attention at the hands of Mr. Blashill and his assistants. It may be interesting to architects to note that it was

given by this important witness as his opinion that for sanitary purposes a theatre is subject to the ordinary sanitary authority of the district, and that the interference of the Council in such matters is not necessary. In cross-examination, the witness showed that, in spite of the many and onerous duties he had to perform, he placed such importance upon this branch of his department as to give it a great deal of personal time and attention. Evidence was also given of the "views" held by the committee themselves.

On the question of charging on the premises the cost of structural alterations to places of public entertainment as a terminal annuity for thirty years, Mr. Arthur Cates gave evidence on behalf of the reversioners. He was of opinion that it would not in all cases be reasonable to charge the cost in this manner, and that the position of the reversioner, who may not derive any future benefit from the alterations, should be taken into account; the reversionary interest should not in any case be subjected to the proposed charge, unless it can be definitely shown that such interest would be benefited by the works.

The evidence given by Mr. Phipps was principally a contention that the inspection of theatres, &c., should be under a Government department, such as the Home Office or the Board of Trade, and that properly qualified inspectors should be appointed, as in the case of mines, factories, and railways. He dwelt very fully upon personal cases he had had before the Metropolitan Board and the County Council, and complained of the want of practical knowledge of the members of the Theatres Committee. He, however, paid tribute to the abilities of Mr. Blashill, and his assistant, Mr. Woodrow, and gave it as his opinion that the superintending architect was not intrusted with sufficient authority, being too much trammelled by the committee.

Mr. Emden gave details of cases which he had personally had to deal with, and stated that while, in his opinion, the Council might reasonably be intrusted with the carrying out of the Building Act, he did not consider them the proper authority to deal with the question of exits, entrances, &c. He also gave it as his opinion that the question of isolation of a place of amusement is not so important as that of making the walls thick enough to be practically fireproof, and of providing proper and efficient arrangements as to the supply of water. In our humble opinion this disregard of the question of the suitability of site is entirely wrong, for unless the site is a good one, how can the means of exit be well arranged?

It is strange that there was such a lack of evidence given with regard to provincial theatres, many of which we know to be in a most unsatisfactory condition. The unfitness of some of these houses was shown by Mr. Simpson, who mentioned by name many wooden theatres that were licensed by the magistrates in the country. This witness thought that one authority, and that a London one, ought to pass all plans of buildings for public amusement. Local magistrates really knew very little about the subject, and local architects very seldom built theatres. One remark was made by this witness: that in course of time the exits from all new theatres should be almost in the same position, so that visitors would really get to know the very best way out of a theatre by their being uniform. We cannot go quite so far as to agree that all theatres should be cast in the same mould; but we think symmetrical planning should be observed.

So far as the evidence given before the committee is concerned, we must conclude with a few remarks on that given by Captain Simmonds, the chief officer of the Fire Brigade, who argued at some length on the

* The present series of papers on theatres now appearing in our issues are from the pen of Mr. Woodrow.

desirability of employing men of the Fire Brigade in theatres, and suggested that the chief officer of the Brigade should be intrusted with the supervision of the fire appliances. The increased cost of this supervision to the ratepayers was shown to be £30,000 a year. It is true that where the public know that the firemen employed are experienced men, there will always be a tendency to allay any panic that may arise. The employment of firemen for other than their legitimate duties is undoubtedly wrong, as it takes the men away from the constant watch which is necessary in a building containing so much inflammable material.

There appears to be a general view that one authority should deal with everything in connection with theatres, &c., and we thoroughly endorse that view. What that authority should be was left for the Select Committee to decide after hearing the arguments of the witnesses which we have cited, as well as many more. We must confess that the recommendation arrived at on this point is not to us a satisfactory solution of the difficulty. The committee were of opinion that the magnitude and expense of the establishment of a separate department of State would have to be considered; but that, apart from this, great weight must be attached to the general policy which has of late years been pursued by the Legislature in the direction of confiding to local bodies throughout the country a wide control and large responsibility with regard to local management, especially in all questions of the structural safety and suitability of places of public resort; for this reason the establishment of a centralised department over the country was not advocated by the committee. "We have full reason to believe," the report proceeds, "that the existing law for licensing and regulation of theatres and places of public entertainment (outside the County of London) has, when the local authorities have properly availed themselves of it, been found on the whole satisfactory."

After calling attention to the peculiar circumstances which call for special consideration by Parliament of the question of the Metropolitan places of entertainment, an account of the large number, the amount of capital risked in the enterprise, the number of persons employed, and the multitudes of people who attend, and citing the provisions of the present Act, the report goes on to say that it is admitted on all hands that within the last fourteen years many places of entertainment in London have been properly closed, because the proprietors could not comply with the requirements made for the public safety, and that there has been a great advance in all structural matters in those which are now open. The credit of this is no doubt mainly due to the zealous efforts, first of the Metropolitan Board of Works, and afterwards of the County Council working through the Theatres Committee. It is acknowledged that it is perhaps inevitable that as a result of these efforts controversy should arise between these bodies and the owners of theatres. Should any future dispute arise, the committee agree with the Council that a standing arbitrator should be appointed, permanently attached to Her Majesty's Office of Works, and under the general direction of the First Commissioner, who should be answerable to Parliament for his action. The Committee also strongly recommended that in the exercise by the Council of its functions as regards structural matters generally, the professional adviser of the Council should be given, as far as practicable, a position of independence, a free hand, and an undivided responsibility, in order to secure a uniform policy and procedure and to avert causes of controversy, either with the licensing authority or with the owners of theatres and music-halls. With these provisions we heartily agree.

Referring to a period of grace of five, seven, or ten years which a certificate of safety should procure for a theatre, &c., the Committee again agreed with the Council. "We also agree that the Council should have a staff of fit and proper persons to act as inspectors of the safety of theatres and places of public entertainment, who should, in our opinion, be permanent officials, carefully selected for that purpose, and we recommend that an inspection prior to licensing day should be conducted by experienced architects."

The Committee evidently found it difficult to decide who should be the one licensing authority. As regards theatres, they recommend that the Lord Chamberlain's authority should continue to be extended to all theatres in the County of London; but as regards music-halls, &c., the authority should be a small standing joint committee of the County Council and of the Quarter Sessions, consisting of an equal number of members appointed by the Council and of justices appointed by the Quarter Sessions. "Such a standing joint committee need find no difficulty in electing a chairman from among themselves under whose guidance they might, being clothed with authority to administer oaths and with judicial immunity, suitably conduct the business, assisted, of course, by the usual official information, and hearing all proper evidence for or against any applicants for licenses." Further, that all licenses should expire on licensing day, but that provisional licenses should be granted at any time.

While admitting the necessity of some reform, we cannot see that these final recommendations of the Select Committee help the matter to any appreciable extent. There would still be the County Council as the authority over structures, the Lord Chamberlain the licensing authority for theatres, and a third or new body, the joint standing committee, the licensing authority over music-halls. This arrangement would neither give the Council what they asked for, nor the theatre and music-hall people what their various witnesses desired.

One thing, however, is certain, that these recommendations will never become law, and we may look before long for another addition to the long list of Theatre Bills.

LATENT WEAKNESSES OF STRUCTURES.

THE number of building accidents bears a certain proportion, though happily a small one, to the increase of building operations; we allude especially to the failures of buildings themselves, and not to scaffold and other accidents during the erection of large structures. On the whole, it may be said that the numbers of failures have decreased, or bear a very small ratio to the increase of buildings—a diminution attributable to the more efficient and improved methods of construction, to the more effective testing of materials, competition, and other agencies. We cannot assert unequivocally that construction is better understood now than formerly, or that there is more care exercised, that buildings are more stable and solidly put together—we rather incline to the contrary opinion, if we make comparison with buildings a century old, to say nothing of those of greater antiquity; but we unhesitatingly assert that we are more scientific; our materials, though smaller in quantity, are more economically used; that in quality many of them are superior, with the exception, perhaps, of bricks and mortar; and that, at all events, the machinery, methods, and appliances we use are greatly in advance of the old ones. Building legislation and by-laws are in operation throughout the country, and have also contributed to reduce scamping, which, of course, has grown with

competition in the trades. Let us compare a modern town building with an old one of a century ago. The stone and brick and mortar may not be any better now; but we have, on the other side, cement and concrete of superior quality, the machinery and appliances for brickmaking and mixing mortar enable us to convert the raw materials to the best advantage; improved scaffolding and lifting machinery have been introduced which enable the modern builder to expedite his work as well as to insure more accurate fitting and workmanship; iron is improved in manufacture, and can be applied in a variety of forms to floors and roofs and other uses. Methods of calculating stresses and testing have enabled the constructor to avail himself of the highest results and expert knowledge. Other materials like terracotta and faience can be used.

All these agencies have materially helped to diminish risk in building; but in spite of all these improvements accidents occur, which show that perfection is impossible, and that the very advantages we possess may become a means of stumbling occasionally. To take, for example, the use of lifting machinery. The derrick crane is now generally used in the erection of lofty buildings, with great advantage in the lifting and adjustment of the load. The "jib" can be manipulated, and be moved nearer or farther from the centre with the load at the same horizontal level above the ground; but yet, in spite of mechanical provisions, accidents often occur by which the jib descends with its weight, or the chain breaks, causing often serious damage, if not loss of life—a disaster that has been rendered impossible by a recently-introduced patented jib-head, lately described in these pages. Again, in iron construction, although many systems are in use by which flat arches of fire-resisting materials can be employed in combination with iron beams, there is just the possibility of some flaw in the iron skewbacks or tie-rods, which restrain the thrusting action of the arches, that renders the whole system unsafe, so true is it that the strength of a structure depends upon that of its weakest part. Every part of the floor or roof of this description may be perfect in construction, yet from a slight weakness of the thread of a screw or a nut the whole structure may collapse without the slightest warning, burying in its ruins many hapless workmen. A very sad instance of the uncertainty of this kind of construction we reported last week. An addition was being made to a large bakery in Glasgow, where several floors were constructed of arches running from gable to gable, and each set of arches on a floor was restrained by a tie-rod of iron. From some unaccountable cause the tie-rod of the upper floor suddenly gave way, causing the arches to thrust or bulge out the north gable wall. The precipitated arches broke the two floors underneath, one after the other. A number of bricklayers on the same floor laying cement, in their haste to escape at the snapping of the rod, jumped out of a staircase window, one of whom broke his leg. The accident might have cost the whole of the men their lives. This is one of many catastrophes of a similar kind. The fault can hardly be attributed to neglect. Some latent flaw in the iron, or some unequal stress on one rod, may have been the cause. If blame can be attached to anyone in such a case, it is to the workman who screwed up the nut, causing a great tensile stress to be suddenly thrown on the tie, or shearing stress on the nut. The system of floor construction on arches resting on beams, and tied together by tie-rods, is one that, to say the least, is open to risk, as a very slight cause, imperceptible to the builder, such as a flaw, is sufficient to imperil the structure. Not only careful design, but scrupulous workman-

ship and supervision become necessary, as the most trivial oversight may be sufficient to cause failure. The whole series of brick arches of a floor of this kind depends on the iron ties; they are, in fact, like a pack of cards, one shifting the whole collapses. The abutting arches constitute a dangerous system, as a few pounds weight on the floor intensifies a hundredfold the outward thrust, which has to be met by the ties. Better systems of arching and floor construction are now used, such as the Dennett system, the Lindsay, and other plans, by which there is no thrust, but simply downward pressure, not depending on a few nuts and screws. Numerous have been the failures to iron roofs depending on tie-rods, only to be avoided by a system of counterbalancing. We have also heard lately of an accident to a church, the chancel arch of which suddenly collapsed. Such accidents have not been numerous, and are generally the result of removing the centres before the arch and masonry have had time to settle, or sometimes caused by the insufficient abutments or buttressing of the supporting piers. These failures are often due to neglect of simple precautions in the construction, and not to any fault in the design. Attention also has been drawn to unsafe iron railway bridges, many of which structures, erected fifty years ago, are now scarcely equal to the travelling loads they have to bear. Here maintenance of the structures to a standard of efficiency, timely attention to members of the iron structure which deteriorate from rust, protection by paint, and other means, are demanded even in those instances where errors in construction have not been detected, and where there is a considerable margin of safety left after wear and tear.

IRON IN ARCHITECTURE.

AMONGST the changes that are taking place in the art of construction, one of the principal is the substitution of new for old materials. A revolt is being made against those older methods of building which have so long held a high place. We are repeatedly being reminded of the inroads of iron and steel, especially in the construction of buildings of any importance in the cities of the United States, the principal object of which is to give rigidity and strength to structures of great height, and at the same time to diminish the thickness of walls. The same tendency is observed in the erection of large buildings in London, that of making piers or stanchions of some hard and resisting material at all main angles, and filling in with a lighter material. We may call this the "rib or pier system" of wall construction, one eminently scientific, but not one that is favourable to art, as it would rob the architect of one source of effect which he greatly esteems, thickness of walling and, therefore, any display of recession and architectural membering, like deeply-moulded jambs, shafted doorways, and depth of reveal. Half the poetry of architecture, its charm of light and shadow, would be gone by reducing our walls to mere skeleton work, tiled over or covered with slabs of concrete, such as the buildings now being erected for the Great World's Fair at Chicago. It is true we may construct our recesses and jambs, but this would be against Pugin's dictum and all authorities who have protested against "constructed" ornament—very well in its way for exhibitions of buildings as illustrations, as we saw in the "Old London" Street at the Health Exhibition, but utterly repugnant to our sense of real architecture. Yet the idea of constructing scientifically and economically has so far taken possession of architects that they do not scruple to employ modes of construction that are radically dishonest. Take, for instance, the adoption of imitation half-

timber work in which, instead of framed timbers of the whole thickness of the wall, thin pieces are put on the face of the wall, or cement is used to give the semblance of framed work. The timbering of buildings is fast declining. We see porches constructed of cast iron; bay and mullioned windows no longer exhibit the old framed and moulded woodwork, but are constructed of cement or artificial stone. The old wooden barge board has disappeared; the verandahs and conservatories are supplied by the wholesale cast iron founder; even the carving is flimsy and thin, and has all the mechanical vapidity of machine-made work. A general surrendering of old to new materials and hand to machine labour is evident. Such a change is inevitable. We do not expect our modern buildings to be like old ones; if they tried to imitate their age it would be a grievous fault. Nor do we expect to see iron fittings and details like wooden ones, as that would be dishonest. What we wish is that there should be more independence in designing; not so great an attempt to copy old forms of one material in another totally different in its nature; and that cheap ornament done by casting or stamping should be restricted.

One important instance of the introduction of iron in place of timber is that of the iron roof, and this substitution is not only observed in new buildings but in old. Very many of our old churches, though happily only those which have been erected during the past century, have already been reroofed or are undergoing the operation chiefly on account of the decay of the timbers and the considerable spans which they have. The cause of the speedy decay of these roofs when they are compared with the far older, and in fact ancient, Mediæval roofs of churches of the Old Foundation, is to be attributed to their flat pitch and want of ventilation. Most of them have flat or curved ceilings of plaster, and the timbers have been exposed to alternate states of great heat and dryness and moisture. The timbers are generally of Memel or red pine, the trusses are often well constructed; but the main intention has been to conceal them entirely, and to form a flat plaster ceiling panelled or a vault. Sometimes the weight of the ceiling and ribs of plaster has caused a breaking away of the plastering or "key" from the lathwork. We remember an old Classic church, All Saints, Southampton, designed by a pupil of Chambers, which underwent a complete restoration of its roof, chiefly because of the dangerous condition of the segmental vault of plaster. Many of the ribs and coffers which were suspended to the timber trusses had broken away and threatened to fall. The whole plaster ceiling, a fine one of its class, was removed, and one of mahogany resembling the old design was substituted. The timber trusses were skilfully constructed, framed to suit the curvature of the vault, but showed signs of decay in parts owing to the want of air circulation. Sooner or later a new roof will be necessary. Very many of the same class of churches in the Metropolis, of which there are several in South London, as those of St. John, Waterloo-road, St. Mark's, Kennington, St. Matthew's, Brixton, and St. Luke's, West Norwood, and many better known, as St. Martin-in-the-Fields, St. George's, Hanover-square, have their roofs constructed in the way described. Some of these roofs have been restored, and others will demand the same process before very long. The question has arisen whether these timber roofs should be reinstated in timber or in iron. The many advantages of an iron roof and its durability have, naturally enough, been emphasised by the restorationists. When it is not visible, but concealed by plaster, what does it matter whether the trusses are of iron or timber? There is, no doubt, a sentimental objection to a material which has never yet been con-

secrated to the purposes of high art, which has only been used for factories and railway sheds. Surely for ecclesiastical structures it is sadly out of place. The objection is certainly one that ought to be faced. An iron roof over a church! Why, the thing would have been quite intolerable a few years ago, and we confess we do not like it now; but when the iron is invisible and all is ceiled in plaster below, what matters? It is fireproof and durable, and will not want frequent repair. Anyhow, the ice has been broken. We believe iron has been introduced in several roofs of this class of buildings, and we lately reported the fact that the parish church of Brixton, an example of the old pseudo-Classic galleried church of the early part of this century, has recently undergone, or is now undergoing, the restoration of its roof, the old timber trusses being reinstated by wrought-iron trusses of braced type, composed of T and angle irons, which will support the flat, panelled ceiling in one span. Such an innovation would no doubt have shocked the sensibilities of so conscientious an architect as Parden, whose work it was; but in less than seventy years after it has been deemed necessary to make the substitution. The question of reroofing in iron is one that ought to be considered by the architect in its many bearings. For buildings of the class we have mentioned there is little to be said against it, except that it would necessitate repainting occasionally to prevent oxidation, and that it may affect the sound a little. Unfortunately we have no experience of iron in roofs over buildings in which large congregations assemble and music and singing and preaching take place. Over churches it has been almost unknown, and therefore architects have cautiously refrained from using it. How, for example, iron trusses will stand the warm, moist atmosphere of the space between the ceiling and the roof covering; whether they will be subject to speedy oxidation, be troublesome owing to the condensation of moisture on their surfaces; whether the effect of iron will be good or bad for the sound, are questions that have to be decided by actual facts. The corrosion of iron has to be set against decay in timber in unventilated spaces. A report submitted to the Glasgow Corporation by the city engineer has proved the existence of dry-rot in the ceilings of the new Municipal Buildings, which will have to be replaced, and a scheme has been introduced by which a space for ventilation is to be left under each. Where there is any dampness without ventilation the dry-rot has set in. An unventilated timber roof favours this condition. We have no evidence to prove that iron in the same position would not be subject to oxidation. Apart from the physical aspect of the case, we have the artistic question as to the propriety of iron in such a position. We could not for a moment tolerate a visible iron roof over a building in which there was nothing else to harmonise with it, and where the woodwork and stonework were designed on the traditional models. A roof of the kind would be seriously out of place in a Gothic church, for example, whether ancient or modern. It would be a discord. Hidden behind a plaster ceiling in a wide-span building the conditions are changed; no one sees it, and whether the ceiling is supported by iron or wood no one is the wiser. The plea of honest construction cannot be raised, for iron girders and columns are constantly used and encased in the best building. Again, it may be argued that ironwork is already introduced into church interiors in many ways, for screens, grilles, railings, pendent lamps, and many other things. These, it is true, are ornamental, as in the decorative wrought-iron rood screens and side chapel screens, and are for some reasons more desirable than the old wooden ones. They are of a purely decorative kind, and the work of the art metal-worker. The

natural prejudice and aversion to iron is dying out, even in ecclesiastical buildings, and it is well if the architect keeps his mind open. The reconstruction of old buildings leaves often no choice open; iron is economical as a support, and its applicability to such purposes as galleries, columns, and other requirements is often so obvious that one's sympathies for the older architectural materials have to yield, or be set aside.

STABILITY OF WALLS ON SOILS.—IV.

Isolated Pier Foundations for Fenestrated Walls.

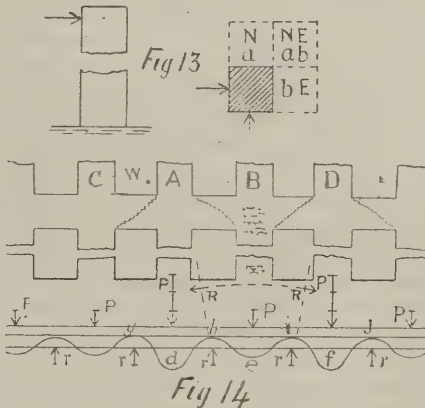
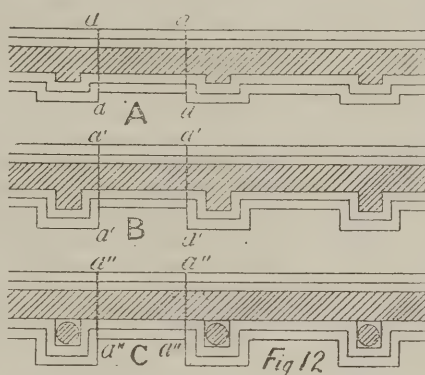
THIS method of treating the foundations of fenestrated walls, on the static pier principle, is not a new or untried structural expedient. The precedents are numerous. It is the same principle which has prevailed prominently in the foundations of the piers of bridges, of ancient aqueducts, of arcaded naves of Gothic and other churches, of the storied loggia of palaces, and in many such-like positions which naturally suggest this isolated arrangement. It is a special structural feature in architectural foundations in Chicago, U.S.A., as initiated, about 1870, by Fredk. Baumann, one of the early architects of that city, for general adoption. The writer about twenty years ago adopted this method in his practice: in some districts he found considerable prejudice amongst masons against omitting the footings under voids in the foundations of ordinary dwellings.

In the Metropolis, as well as in our provincial cities, high and prominent buildings which have their upper floors carried upon strong steel trusses, supported by steel or iron columns or stanchions running down and encased in the masonry piers, have isolated or independent foundations. The structural requirements of arcaded lower stories of commercial buildings, and in such other positions where the maximum area of window-light is required in the lower stories, naturally suggest and necessarily develop this method; and so, likewise, do shop-fronts which are overrun by bressummers carrying upper stories, and all supported upon piers or abutments, which are usually engaged to cross or division walls, with or without intermediate columns under the bressummers, suggest the same independent pier principle, though in the case of the vertical supports having an engaged connection with the cross-walls, the static independence of the pier is destroyed. In such cases, when the foundation is built on a compressible soil with a high-unit load, an injurious difference of settlement might be caused if a careful adjustment of the extent of bearing surfaces be not effected, which is difficult to do, as it involves the perimeter element of frictional support treated of in the preceding number (III.). Some cases of ruptured lintels, alluded to previously, may arise from this cause, as well as from continuous foundations. The bay wall-space or panel between such piers, and sometimes called "curtain walls," are then afterwards built in when the building is roofed. It may consist of the lighter descriptions of walling when built in an area, and containing window and door openings.

In Chicago, the steel rail and I-beam grid-footings, which are embedded in concrete, that have been adopted with the view of rapidly spreading the footing base sufficiently within the least height, and thus avoid their usual incumbrance of valuable basement floorage, are designed upon the uniform system of the isolated method of pier foundations. This economy of basement floor-space is particularly valuable in Chicago, by reason of the shallowness of the "hard pan" clay bed, which floats on a soft bed of mud over 70ft. deep. The "hard pan" there affords the sustaining foundation soil, and its surface is of limited depth below the street level.

Static Piers Ignored in Ordinary Buildings.—In the ordinary run of houses built all over the country the static anatomy of fenestrated walls resolving their foundations into isolated pier supports is never adopted, even if the designer recognise the action of the static principle involved. This persistence, no doubt, arises perhaps more from the deep root of the opposite custom which has hitherto prevailed, than from absence of intelligent recognition of the scientific basis of the isolated method, and often because that, in ordinary houses, there is a vague idea there cannot be sufficient difference of settlement to cause a sensible effect; but the facts which are

patent to the observer by their results are often otherwise. But when there is a consciousness of probability of unequal settlement, hoop-iron bond is adopted as a save-all expedient. But why create the necessity for hoop-iron bond at all, when, by the use of ordinary skill in the omission of footings under voids, its use becomes unnecessary and superfluous? The injurious effects of violation of the requirements of static piers is often very incipient, unexpected, and surprising. A remarkable case of this kind is related by Mr. Baumann. It occurred in the east gable of the old "Crosby Opera House," destroyed by the great Chicago fire of 1871. In it were only two small windows (one over the other in the centre of the wall), the voids of which only omitted twenty tons of brickwork, and they were placed so high up that ordinarily there would be no suspicion of their producing fissures—the lower one was 32ft. above the level of the foundation, and the upper one was about 22ft. higher up. The wall was 92ft. high and 92ft. long. The footings were 5ft. longer—in all 97ft. on footing-plane, and weighed 850 tons. The basement wall was built in solid rubble,



laid in cement upon the "hard pan" clay; the wall above was 20in. thick of brickwork for 20ft. high, the upper portion being 16in. thick. So that here were voids of 20 tons producing unequal settlement in a wall of 850 tons and 97ft. long on the level of the footings, producing a pressure of 26lb. per square inch on the foundations—i.e., 1.67 tons per square foot only, resulting in serious fissures in the line of the voids, breaking through the tenacity of brick walling of 70ft. high, and 20in. to 16in. thick, besides that of the heavy rubble basement wall 12ft. high laid in cement. Similar effects have been noted in heavy internal masonry walls having only a few door passages through them. But in all such cases, if the foundation underneath the voids be omitted, no such unequal settlements would occur, and then hoop-iron bond may safely be omitted.

Pilasters, Buttresses, or Engaged Columns.—When these are features of a façade the outline of the foundation naturally partakes of the shape of the outline of the section on the plane of these features; hence the usual design of the footing merely follows the configuration on the horizontal plane, instead of the design being dictated by the static requirements of the voids between the vertical features, whereby there is an adjustment of the position of the axis of loads to coincide with the centre of the supporting base, at the same time the intensity of the load must be equalised to the safe-bearing power of the

soil. But this merely following the horizontal outline of the features in connection with the wall is only a compromise, and does not completely satisfy the static requirements of the case. Hence, when the soil is perceptibly compressive, there is the ever-present tendency to unequal settlement under unequal distribution of loads as above occasioned with the consequent rupturing of the walls, &c. The further development of such unequal settlements only depends upon the superiority of the disruptive forces over the horizontal tenacity of the masonry, which is frequently supplemented by hoop-iron bond. It is, however, better to avoid the blunder of blindly creating these destructive forces by omitting the portion of the footings underneath voids, as in the examples in Fig. 12, between the lines *aa* in example A, between the lines *aa* in example B, and between the lines *aa* in example C, and thus dispense with hoop-iron bond and save about £1 a rod in the brickwork. The distorting strains in various directions which are produced by foundations under voids frequently reach up to the roof, and these cause deformations so that the gutters and other parts of the roof leak more or less. When once these displacements begin, their recurrences and continuations are always inevitable, though uncertain.

Normal Transverse Directions of Wall Failures.

—There are but four normal directions in the horizontal plane in which all wall or pier structures will yield to overturning or transverse force tending to deflection—that is, two in opposite direction in the line of its length, which may be distinguished as *plus* and *minus*, and two acting in opposite "senses" transversely of it, and similarly distinguished. All other directions oblique to these must partake partly of each of the adjacent normal directions, and can be referred to definite quantities of each of them respectively. Thus, suppose Fig. 13 to represent a plan and elevation of a pier acted on by forces in the directions of the arrows. First, if the force act towards E, it displaced the top of the pillar to *b*, as shown by the dotted square *bE*, or if a force acted separately towards N it would displace it to the dotted square *aN*. But if both forces acted together or consecutively, it would be displaced to NE in the position of square *ab*.

Disruptive Forces (direction of their action).

—The directions in which disruptive forces act are indicated by considering the principle upon which the results are manifested as depending upon the fact that structures yield at their weakest points and in the weakest lines of direction. Under this guiding principle it is not difficult, in most cases to analyse the direction of action and reaction of the forces involved in any case. The forces at work, their origin and initial position, must first be discovered. Thus, suppose the piers on each side of a vertical tier of windows to settle unequally, from whatever cause, because there may be more than one cause in operation, and there may be also indirect, as well as direct, causes which will be considered in their place. This unequal settlement is shown in Fig. 14, by the scale arrows at foot of piers A, B, C, and D, by which letters also the entire piers will be distinguished. Accordingly, A and D piers are shown to have settled 3 units, which may be an inch or any fraction of an inch, and B and C to have settled only one such unit, making a difference of 2 units, of unequal settlement. The distribution of the fissures which would follow this inequality of depression would pass through the weakest part of the wall structure, the spandrels and masonry transoms, and would usually partake somewhat of the direction of the zigzag lines A to C, A to B, &c., whereby the lower part of the wall transom, in the form of an inverted bracket attached to piers A and D, would drop, as shown by the scale-arrows A D. The piers A D, to which the inverted brackets are attached, have settled two times more than the adjacent piers. The line of rupture shown along the sinuosities of the mortar-joints is usually the weakest, but not the most direct, course. The latter would take effect in a vertical shearing action down through the masonry transom. If the window-sills above these spandrels be strong, their depression at the A and D ends may tend to crack the upper brickwork brackets attached to B and C in a more or less vertical line between the reveals of piers D and C. The sill may also, by its leverage at the C-pier end, tend to crack away the thin reveal of the opening W. Frequently the sill is cracked near its centre before thus displacing the reveal. If the pier D

to the right of B had settled, say, 3 units, then the pier B in the centre between A and D, which had only settled one unit, would thereby be dragged down by the resistance of the spandrels of the several stories before rupturing. The pier B being thereby abnormally and usually eccentrically loaded, would thus likely be bowed outwards, showing opening joints near the centre of the height of each window void, or it might be otherwise displaced in the direction in which its resistance was weakest.

Further considering only these three unequal settlements as represented by the main and secondary concave curves *d, e, f*, with the alternate convex curves *g, h, i*, which may be assumed as roughly indicating in exaggerated elevation the bottom plane of the footing base, being highest at *g, h, i, j*, and lowest at *d* and *f*, the secondary depression being at *e*. This disposition of the footing naturally gives rise to abnormal stresses, causing more or less tendency of the substance of the wall to radiate vertically or be expanded unequally or fanlike in the direction of the lines and arrows *r* and *r'*, round the centre of the convex curves *r* and *r'*, and thereby cause a strain upon the horizontal tenacity of the masonry, increasing upwards with the extent of the leverage above the centre of action. The spandrels or transoms being the weakest parts of the wall, their yielding by fissures or opening of joints might cause the sills to draw out at either end. If the window voids were arched, the arches would be more or less shattered. In like manner regarding the pier A or D which have settled lowest, the effect on the pier itself of the concaving of the foundation plane would be radial compression or contraction towards the centre of the curves *f* or *d*, but with a more contracted range than that of the radial lines *r* and *r'*. These two radiating forces would coalesce with the two corresponding radiating forces generated by the curves *j* and *g*, and neutralise each other at some intermediate point, as, for instance, in a vertical passing through the centres of the piers A and D.

(To be continued.)

DECORATIVE LIGHTING AND IRON-WORK.

IT has been left for the art-metal worker to bring the electric light into harmony with our architectural and internal fittings; to support or suspend the light in a variety of artistic forms; to soften or diffuse the intensity of its brilliance;—in a word, to clothe and embody the light in a form at once appropriate and beautiful. The electrical fitting is no longer a crude piece of mechanism, such as the inventor and engineer first gave us: the artist and craftsman have been enlisted to adapt it to various conditions and wants, and iron and brass hammered from the forge, black or polished, plainly wrought or jewelled, have been applied in a marvellous variety of forms which, in their beauty and fineness of workmanship, vie with, if they do not excel, the work of the smith's art of Italy and Germany. We no longer are content with stereotyped cast metalwork in the shape of electroliers, brackets, standards, and fire-grates; but we desire something original, to introduce variety into these fittings. One West-end firm, Messrs. Rashleigh, Phipps, and Dawson, of 53, Berners-street, W., have devoted themselves specially to show how the electric light can be introduced in an artistic manner, and with that view the firm have gone to considerable expense in the production of art metal-work of a high character. We lately drew the attention of our readers to the central mosque and fitted rooms shown by this firm at the recent Electrical Exhibition at the Crystal Palace, where some very ornamental and effectual lighting appliances and wrought metal-work were to be seen, quite superior to anything in this direction that had been done before. A more recent visit to the showrooms of the firm has given us the opportunity of calling our readers' attention to certain improvements and artistic developments of the art, and to give a few sketches of the class of fittings and wrought-iron ornamentation introduced. The designs have been prepared by the artist of the firm, Mr. W. Amor Penn, who was awarded several first prizes at the recent Armourers' and Braziers' Exhibition for hammered work in the Applied Ornament section. These designs are distinguished by a certain freshness of treatment not always found in art metal-work, as we notice in the fire-grate and

dogs and railing. We have had too long a surfeit of replicas, and one reason why architects have not encouraged art metal-work more is that there is the mischief of seeing one's design repeated in the stock patterns made in the trade. Messrs. Rashleigh, Phipps and Dawson, have scrupulously avoided this mistake in their large collection of objects which have been manufactured at their own works in Stanhope-street, Euston-road.

In the design of fittings adapted to the purpose of the electric light many things are to be kept in view. The object has been to adapt brackets, electroliers, standards to this new illuminant; to give to these forms of support for the incandescent light a particular treatment distinguished from that which has been in use for gas. More elegant and graceful forms—many of them representing natural and organic objects—suggest themselves to the designer, as those of the sun, planets, flowers and fruit, the imitation of which, within artistic limits, has been taken advantage of, as in the very beautiful glow-lamps introduced by this firm. The bracket sign or lamp illustrated by the sketch on the upper left-hand corner of our double-page of illustrations is an example of Flemish treatment in wrought-iron well suited for exterior lighting. A ground-glass globe with rays of light in polished metal may contain the light, and represents the sun. For lighting building exteriors of various kinds this wrought-iron bracket may be both useful and ornamental. What can be more appropriate than a forged iron bracket supporting a lantern or carrying one suspended, three or four examples of which we give? Many other very elegant adaptations of the forged or polished iron bracket have been made: some of these support spheres of ivory with pendent lanterns, as those in the "Solar" room at the Crystal Palace, representing the solar system or the central sun and the planets round it; others are glow-lamps imitating flowers with petals. In these designs the artist has had to adapt not only his bracket support, but also to introduce a form of receptacle to his light appropriate to its nature. Many suspending lamps from brackets are to be noticed in Berners-street, some of them exceedingly elegant, as in the hall lantern of Flemish design in polished brass, and in the triplesuspended lamps we illustrate over the sketch of staircase handrail. This description of lamp offers itself admirably in the lighting of interiors. The brackets can be made to spring out of the surbase mouldings or stringcourse above a dado, or be introduced into panels or medallions in the wall, and from these brackets wall-lanterns depend. For drawing-rooms and galleries nothing is more appropriate or ornamental than this mode of holding the lamps, as the shadows are reduced to a minimum, and the panels or pictures between the brackets or sconces are well lighted. We see examples of all forms of sconces, girandoles, and brackets in black polished and gilt iron, all shaped by the smith's hammer, full of character and quaintness, and allegorical or symbolic in *motif*, contrasting greatly with that coarse kind of brasswork one sees, in which bent tubes and polished balls are decorated by flat stamped-out scrollwork. Architectural considerations have not always been consulted in the fittings of this kind; but in the lantern designed for an alcove (see sketch at top of sheet), and fixed by this firm in the Lyric Club, Coventry-street, we have a sensible treatment.

Standards and electroliers are other forms of utilising and supporting the electric light, the one from the floor, the other from the ceiling, and in these modes the manufacturers have often gone wrong, not duly realising the conditions of each. Art metalwork could not possibly be applied to a more decorative purpose. The ideas of support and suspension must be kept in mind in the design of standards and electroliers: the rigidity required in the lines and curves of the one is not tolerable in the other. We have given an example of each in the sketches. An electrolier of polished brass, in which organic forms are introduced founded on plant growth, with Venetian glass opalescent shades representing flowers, is an artistic production that no stickler for propriety can question. We illustrate a bronze figure for a hall staircase which Messrs. Rashleigh, Phipps, and Dawson commissioned Signor Marolda to model for them, and which they manufactured expressly for the late Electrical Exhibition. The figure represents the new light holding down by

her side the old in the shape of an inverted torch. She stands on a globe signifying the earth, and on it is the inscription, "Electricity Dominates the World." The child at the foot holds his hand before his eyes against the bright light. Amongst other symbolical designs is a mermaid, cast in the ancient *cire perdue* process used by Cellini; and a water-spray fountain, with triton and dolphins, and exhibited in last year's Royal Academy, is well adapted for this light.

A visit to the showrooms in Berners-street will give a good idea of the possibilities of the light of the future, and how it may be applied in a thousand different ways. Incandescent lights of every conceivable form are noticed, perhaps the most quaint and pretty being the patent cone light invented by Mr. Jordan of Brighton, consisting of a series of reflector petals or leaves, to represent a flower, in the centre of which a lamp is placed, the light being transmitted through coloured glass. Nothing can be more unique than this glow-lamp arrangement of polished metal in the shape of copper, brass, or silver disposed as petals, and several designs are to be seen in action suitable for boudoirs, and which this firm is applying for domestic and for advertising purposes. One is being fixed at the new Empire Theatre, Brighton. The introduction of jewels or beads of Bohemian glass for diffusing the light is another new departure, and many very striking and brilliant effects are produced by means worthy the attention of the decorative artist. Very wonderfully finished are several of the lanterns, and the finely wrought-iron and brass brackets beaten out by hand in some instances from sheet metal. Almost fairy-like in effect are the glass jewels and fringed shades of beads in delicate hues, and the lights shaded by silk and other fabrics, one standard stamp with a shade of this kind being illustrated on our sheet. In conjunction with the arts of the metal-worker, the combination of metal, the use of coloured glass in the form of fringes and beads, the imitation of flowers and allegorical figures, the electric light promises to become a valuable aid to interior decoration.

LAND SURVEYING AND LEVELLING, AND THE TESTING, ADJUSTMENT, AND USE OF MATHEMATICAL INSTRUMENTS.

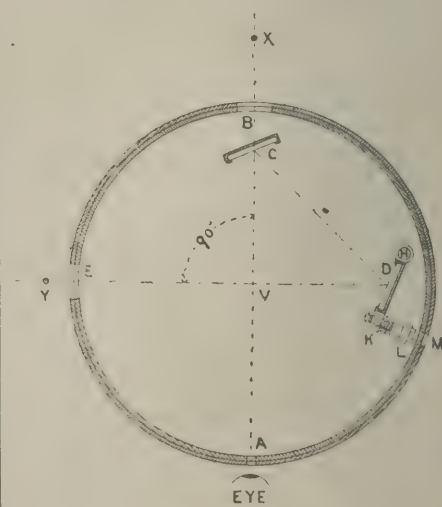
By G. W. COBHAM, P.A.S.I.,

("Crawter" and "Special" Prizeman of the Surveyors' Institution.)

(Continued from page 101.)

THE OPTICAL SQUARE.

THIS is an instrument used, like the cross staff, to set out right angles; but it has the advantage over the cross staff that it can be



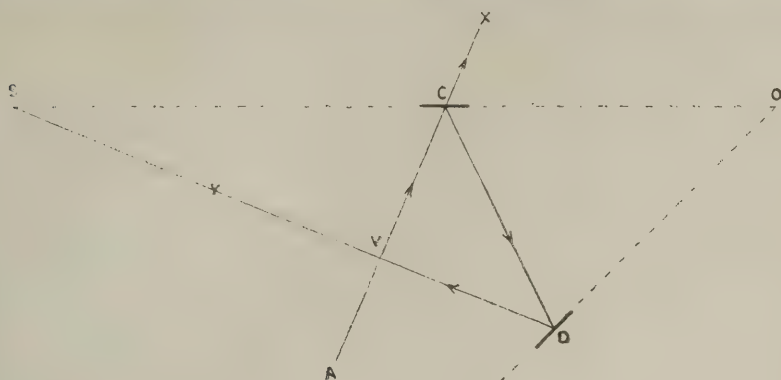


Fig. 39.

what is seen when the eye is placed at the sight hole. Fig. 39 shows the principle on which it is constructed.

The outer case is in two parts, one within the other, one being fixed to the top, the other to the bottom; they revolve on one another for a short distance, so as to close all the holes when not in use.

The eye is placed at the hole A, and the staff X sighted direct, through the hole B at the upper part of the instrument. The staff Y is seen through E below, after reflection from the mirrors D and C; the rays of light passing from E to D, D to C, and from C to the eye at A. When the two staves appear above one another, as if part of the same staff (if the instrument is in adjustment) the directions from the centre of the instrument to the staves form a right-angle. If it is required to sight a staff to the right of the base line, the instrument is turned over, when DE will go to the right; Y will then appear above X. Some instruments have another pair of

staff X can be seen over it. As, however, an edge would interfere with the sight at the point where the two images come together, C is usually the full height in glass, but the silvering only extends half-way up. The dotted lines show the planes of the mirrors; the full lines show the courses of the rays of light, the arrow-heads on them showing the direction from the eye to the staves.

It is a fact, demonstrated by experiment, that when a ray of light is reflected by a mirror the path of the ray after reflection makes the same angle with the normal from the mirror as the ray did before reflection, but on the opposite side. As the normal from a plane is at right angles to it, and all right angles are equal, it follows that, when using plane mirrors, any ray after reflection makes an equal angle with the mirror to the angle it made before reflection; that is—

$$VCS = DCO (\alpha), \text{ and } ODC = PDS (\beta).$$

$$PDS = DSO + DOS \text{ (I. 32)}$$

But—

$$PDS = ODC (\alpha); DSO = VSC; DOS = DCO$$

$$\therefore ODC = VSC + DCO \dots\dots\dots (\gamma)$$

$$VCS + VSC + SVC = DCO + DCO + ODC \text{ (I. 32)}$$

But—

$$DCO = VCS (\alpha); ODC = VSC + DCO (\gamma)$$

Therefore the equation becomes—

$$VCS + VSC + SVC = VCS + VSC + DCO + DCO$$

Taking VCS + VSC away from both sides—

$$SVC = 2DCO.$$

This gives the general rule upon which the construction of the quadrant and allied instruments depend. When a ray of light is successively reflected by two mirrors, the deviation of the ray is twice the angle of the inclination of the mirrors to one another.

Of course, in the optical square D O C is made 45° ; therefore $SVC = 90^\circ$, or a right angle. The angle of the two rays depends only on the inclination of the two mirrors, and does not depend at all on the inclination of the ray to the mirror, so that if this changes the angle is unaffected. When the instrument is held in the hand, the inclination of the ray to the mirror is continually varying; but, provided the motion is not sufficient to throw the object off the mirror, this does not vitiate the result. Obviously, this property is of great use—in fact, indispensable—for any instrument to be used at sea.

(To be continued.)

THE ARCHITECTURAL ASSOCIATION EXCURSION.—III.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

BRIDGWATER CHURCH was seen as the first object of interest on Wednesday. The tower was restored by the late J. D. Sedding, who erected a stone screen at the west end of the church, which is a spacious and handsome one remarkable for its tall thin spire. *Cannington Priory*, where they incorrectly say "Fair Rosamond" was educated, includes the remains of a Benedictine nunnery, founded by Robert de Courcy in 1138; an account of the institution is contained in Mr. Hugo's "Mediaeval Nunneries of the County of Somerset." In 1602 the manor was granted to Thomas Lord Clifford, in whose

family the estates still remain, and the premises, after having served as a Roman Catholic nunnery till a few years ago, are now occupied as an industrial school for boys brought up in the same faith. The buildings cannot be said to merit much praise, for the Debased Tudor style in which they were erected has little to commend it. The Classic chapel to the school is poor in the extreme. The short, lofty church is covered by a single roof over nave and aisles, which has a good spacious effect seen from the high altar pace. The domestic chapel in Gurney-street Farm near the church is *in situ*, but is used as a china closet. The excursionists were not allowed to visit this building. The tower of the church is massive and heavy, grouping best from the east end. In the building are some screens, and an old oak chest is in the vestry.

Blackmoor Farm was next visited, and we give a view of the building among our illustrations to-day. It is chiefly interesting for the chapel, which still exists, though desecrated. Inside there are two wall-niches on either side of the window, and these are of capital design with delicate detail. The beam over the sanctuary shows the mortices where the uprights of the screen once stood, but placed further west of the chapel than at present. From the rear over the mill weir the house makes a pretty subject, but architecturally the view herewith depicted is the best. Remounting the drags after some sketching had been done under a tropical sun, the Associationists soon reached

Spaxton Church, which lies "where zun and zoil aid the farmer's toil," in the lowlands beyond the furthest spur of the Quantocks, and contains some curious bench-ends and an alms chest, besides a beautiful 14th-century churchyard canopied cross. The altar tomb of the De la Hilles, in the chancel opening into the vestry, should be mentioned. The full-length effigies of the knight and his lady are in remarkable preservation. So complete are the figures as to lead to the question as to their authenticity; and at any rate, the surface of the stonework has been re-worked, and no part is broken save in the canopy over the monument. In the sacristy is a very rich Old English carved chest. The pewing is very varied in the carvings to the ends, some being especially interesting and good in design, such as the "Fuller's pew" standard, but others are coarse and poor. The church, built of very large stones, is not a very refined example of our national architecture, but as seen from the east end the tower and gabled aisle pile up well with the nave and chancel in massive grouping, though the detail lacks refinement. The courthouse adjoining the churchyard is of Tudor date, with most of the ancient windows remaining; but there is nothing worth specially naming respecting it. The farmer makes rare cider on the premises, and entertained his visitors with more than a sample. Thus ended the work of Wednesday.

Taking train on Thursday by eight o'clock, an early start was made to Williton, where the party set off by carriages to *East Quantoxhead*, and amidst the pouring torrents of rain two hours and a half were spent most profitably. Mr. John L. Robinson, R.H.A., before the wet came on, took a group of all present before the entry to the mansion. *East Quantoxhead* is the nearest village to the sea, "where deep below the yellow tide lashes the pebbly shore, and in winter roars with a bleak and chilling blast from over the narrow channel." The plain, solid-looking Elizabethan manor-house, embodying the remnant of a bigger mansion of 15th-century date, stands close to the shore by the side of the simple old Parish Church, which is of special interest inside, but having few external pretensions. There are inside some very good bench ends, and a capital pulpit (see panel herewith illustrated), and on the north of the chancel stands a fine stone altar tomb of 16th-century date, under a beautiful canopy, in memory of Hugh Luttrell. The house called "Bell Castle" contains some famous plaster chimney-pieces of bold and somewhat rococo design, elaborated with figures illustrating Scriptural subjects chiefly, piously conceived no doubt, but very crude in design. The coloured hearth tiles in blues, greens, and brown are very good, and uncommon. The mullioned windows of the house are exceedingly simple, and on the old part is a good battlement, with quatrefoil panels. The principal staircase is a suggestive Jacobean example of the plainer sort, as will be seen by the accompanying detail from the pocket-book

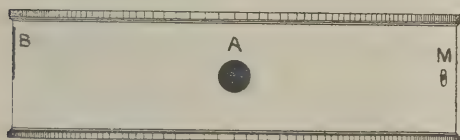


Fig. 37.

mirrors so that a staff can be sighted in each direction at once. It can then also be used as a line ranger, as when the two staves are made to coincide, the centre of the instrument is on the line which joins them. The square is adjusted as follows: An object is set up at right-angles to the line joining two others, as shown in Fig. 35. The square is then held at B, and if A and D coincide, it is in adjustment; if they do not coincide, they must be made to do so by turning the screw at M. The mirror D is pivoted at H and tapped at K. The screw works in the hole K, and a shoulder butts against the block L,

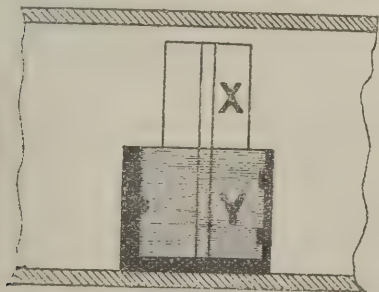


Fig. 38.

which is fastened to the bottom of the instrument. K and L are kept apart by a spiral spring round the screw. They are held together by the screw, and any movement of it causes the mirror D to revolve round H until it is in the right position.

The general principle of the instrument is shown in Fig. 39. This figure also shows the principle of the sextant. The mirror C only extends half-way up the instrument, so that the

of Mr. J. A. Gotch, F.S.A., whose sketch plan of the house, with marginal notes, serves to show the arrangement of this rambling old dwelling. It belongs to Captain Luttrell, who put the house in good repair a few years ago. The manor has been held by the Luttrells in direct line from the Conquest, when it was granted to Ralph Paganel, and is now well cared for. The owner met the excursionists, and explained the place. In the church we noted a charming east window by Mr. Kempe, in white glass, with the crucifix and SS. Mary and John in bright and artistic colours.

The quartermaster, Mr. Charles Wellard, notwithstanding the downpour, sounded "marching orders" for the return ride over the hills, the next item on the programme being lunch at *Williton*, which lies to the landward side of the hill, where stands St. Decuman's in a shallow valley, backed by a landscape of cultivated high grounds and vales. It is a small, straggling village with two sheltered streets of cottage homes embowered in scarlet creepers and jessamine. Two old mutilated crosses stand hard by the doors of the Egremont Inn and the church, once the chantry chapel, erected by Robert Fitz-Urse, brother of Reginald, who had a hand in the murder of St. Thomas à Becket, the "pestilent priest," whose assassins were well represented in this part of Somersetshire. Reginald Fitz-Urse lived at Williton in the reign of Henry II., and Sarnford Brett Church contains the recumbent effigy of another of Becket's murderers—Richard le Bret, sometimes called le Brito.

Leaving the hospitable "Egremont Arms," the "trippers" set off at full trot, and by this time the rain had cleared off fairly well. Half an hour's drive brought them through the park to *Nettlecombe Court*, once the home of the Raleighs, and now the beautiful estate of the Trevellys. The mansion, of Tudor date, was once surrounded by formal gardens, a veritable ancestral home rich in heirlooms, such as the curious miniature portrait of Charles I. worked with his own hair. The manor house adjoins the churchyard, almost touching the western tower. It has been much modernised in Georgian times, but has a good hall and staircase, with nice plaster-work and a few pieces of furniture. The church is very uninteresting. *Combe Sydenham*, with its gabled tower, stands close to the road, and is dated 1580. It is said to be haunted with the ghost of a Royalist soldier, Sir George Sydenham, who died in 1595, leaving a chequered memory, like his king. At large he rides down the Coombe till cockcrow, and seldom, if ever, visits the hall nowadays. The Drake cannon ball legend is associated with the place in connection with Elizabeth Sydenham, who married Sir Francis after all, though if the story may be credited, she was about to be married to another when the meteorite came down in a storm and stopped the ceremony. In the drawing-room are some tapestry and other curiosities; but the owner would not admit the excursionists. They sketched outside. The church at the village hard by is a large Perpendicular building, with a somewhat earlier tower of poor character. The arcade separating the chancel and nave from the north or Halsway aisle consists of five large arches and two smaller ones, the columns of which are both pierced elegantly with double hagioscopes in a very unusual way. Cardinal Beaufort, who lived at Halsway, built this aisle. Sir George Sydenham and his two wives rest recumbent between the Nottley aisle on the south side and the chancel, under a canopy, peaceful enough in spite of the ghost tale. Chapels existed in both aisles, and every bench throughout the church is carved more or less admirably and richly. Outside, the church looks very rich, owing to the sculptured battlements and gargoyles. *Halsway Manor*, in Stogumber parish, is chiefly of Henry II. time, with a nearly perfect front of low proportions. A bay window and three doorways give it interest, surmounted with a battlemented parapet enriched with panels and pinnacles, a bell-cot, and gargoyles. At Stogumber the train back to Taunton was met, and soon the comfortable London Hotel was reached for a seven o'clock dinner. During the evening the town was brilliantly illuminated, and the cyclists' procession of crafts and local institutions perambulated the streets, accompanied by bands and torchlights, lanterns, &c., giving a quaint gala sight long to be remembered.

Friday was a lovely day, and the country seemed more charming than ever, high away over the hills, through the woods, and so over after

leaving Kingston, by way of the Beacon, approaching 1,000ft. above the sea, to Cotelstone, deep in the valley at the foot of "Will's Neck," the southern point of the Quantocks. *Kingston St. Mary*, the first place seen, has a well-designed and graceful western tower, very similar to some others in the district, particularly Staple Fitzpaine, St. Peter and St. James's Church, Taunton. The structure is covered with scaffolding, undergoing a process seemingly of repointing. The flatly-groined ceiling of the handsome south porch is worthy of imitation, and the wonderfully varied and beautifully detailed oak-beach pewing in the church furnishes a perfect encyclopædia of Gothic ornament of the later types with Flamboyant fancy. The church itself is not so interesting; but in the nave hangs an excellent and large brass candelabra of three tiers of lights. Before starting for the long walk up the hill already referred to, the party tasted the black cider for which Kingston is celebrated; but the general opinion was not in its favour.

The Stawels of *Cotelstone* obtained their estates at the time of the Conquest. Sir John Stawel, an ardent supporter of King Charles, fought Blake, and bid fair to become one of the most powerful foes of the Roundheads in West Somerset; but the Parliamentary leader was too strongly reinforced with rebels, and, marching to Bishops Lydeard, he routed Stawel, stormed his house at Cotelstone, ruined the manor, and appropriated the lands, throwing Sir John into Newgate, where he lodged for thirteen years under a fine of £25,000. The Restoration brought Stawel back to Somerset; but the house lay waste till it was converted into an ivy-clad farm. In Jacobean architecture it takes a somewhat unusual place, on account of the baluster-like treatment of the mullions to the windows, the same form being given to the wall-piers or buttresses. In 1855 Mr. Esdaile, grandfather of the present owner, restored the building with the idea of renovating the house, so that it now fairly represents the mansion as bombarded by Blake, several of the original parts remaining. The house is used as a farm, though it looks like a private "residence of quality." The outer gateway piers and inner gatehouse, corresponding with the manor house, were but little injured by the Roundheads' arms, though the outer gate formerly spanned the road, and has been entirely rebuilt in its present position. Judge Jeffreys hanged two of Monmouth's adherents on the archway out of spite to Lord Stawel, who objected to the horrors of the Bloody Assize, although he supported the Royal party. The church, the mansion, the keeper's house of stone like the house, and the timber cottages thatched with straw make a group of rare picturesqueness beneath the wooded slopes of the Quantocks. The church is more mixed than others in the district, with Transitional, Norman, and Decorated work in evidence. The Stawel tombs and the font, the carved pulpit, bench-ends and reading desk all combine in making the little building locally interesting; but the church has really been too over-restored to be of any special value to architects, save as a pleasing feature in the landscape, with its square red sandstone tower and lofty spirelet over the stair turret on the north face. We give a view from the garden of the main front of the house, and the tower of the church shows just over the ridge. The interior has been so entirely modernised as to hardly occupy the visitor's time with profit, and the gatehouse as re-erected is scarcely more than a piece of grotto work, and would make a capital background for the next A.A. Soirée extravaganza. *Bishops Lydeard church*,* of which we gave a photographic view, was the last place seen on Friday. We have mentioned it before as possessing an exceptionally fine tower, built in the days of Henry VIII. This is of four stages, each of which is lighted by delicately-traceried windows, and the battlements are so small in their detail, that iron cramps and bars holding the work together form a complete network, and rather spoil the contour. The screen is really a magnificent one, but it is so highly elaborated in colour and gold as to give it a tawdry appearance. The animal carvings and quaint conceits carved on the seats in the church are also very rich and varied, and the churchyard cross of 14th-century date is the finest in these parts, being fairly

perfect, and enriched with a niche and statue, as well as by bas-reliefs round the plinth. The church itself is large and well kept, but the decorations of the chancel seem to be in poor taste, like the coloured glass in the windows. The detail of the exterior is somewhat coarse, but the building is unquestionably handsome. A drive of five miles brought the excursionists back to Taunton for the final dinner soon after six o'clock. After the festivities of the evening had somewhat advanced, and the usual toasts had been proposed, an informal meeting was held for discussing next year's headquarters and the election of the committee. South Norfolk and North Suffolk, including the places not visited during the Norwich and Bury St. Edmund's excursions, will probably be chosen, but details necessarily remain with the committee.

On Saturday the excursionists devoted their time left in Taunton to visiting the grand church of St. Mary's, of which we herewith print a view, and they saw the equally interesting church of St. James and the Castle, now converted into an extremely valuable local museum, and possessed of the wonderful Pigott Collection of original drawings in Indian ink washes by the two Bucklers (1827-47) of Somersetshire houses, churches, and abbatial buildings, in six volumes. A selection of these views should be reproduced and published, for many of the sketches are exceedingly good, and evidently were made on the spot. There is not much old building remaining in Taunton of value to the architectural student other than these already named. The brick-built almshouses over against the main street look like a bit of old Oxford, but the chimneys are made too much of—in fact the buildings look all chimney. The red-brick Market-houses, erected in 1772, alongside the square Town-hall on the parade, are bald in the extreme, but they are not vulgar and pompous, like most market buildings which are built nowadays from designs selected in competition, which, as a matter of course, must look "attractive" to catch the eye, and "cheap," to stand a chance of being carried out. The timbered gables at the back of the Town-hall deserve a passing mention, and so does the Church of St. John in Park-street, a florid building with a handsome tower and spire conceived on French models. It is attributed to Sir Geo. Gilbert Scott, but looks hardly like his work. Street, in his early days, might have done it. So ends the third A.A. excursion in Somersetshire.

PUBLIC BATHS AND WASH-HOUSES.—II.

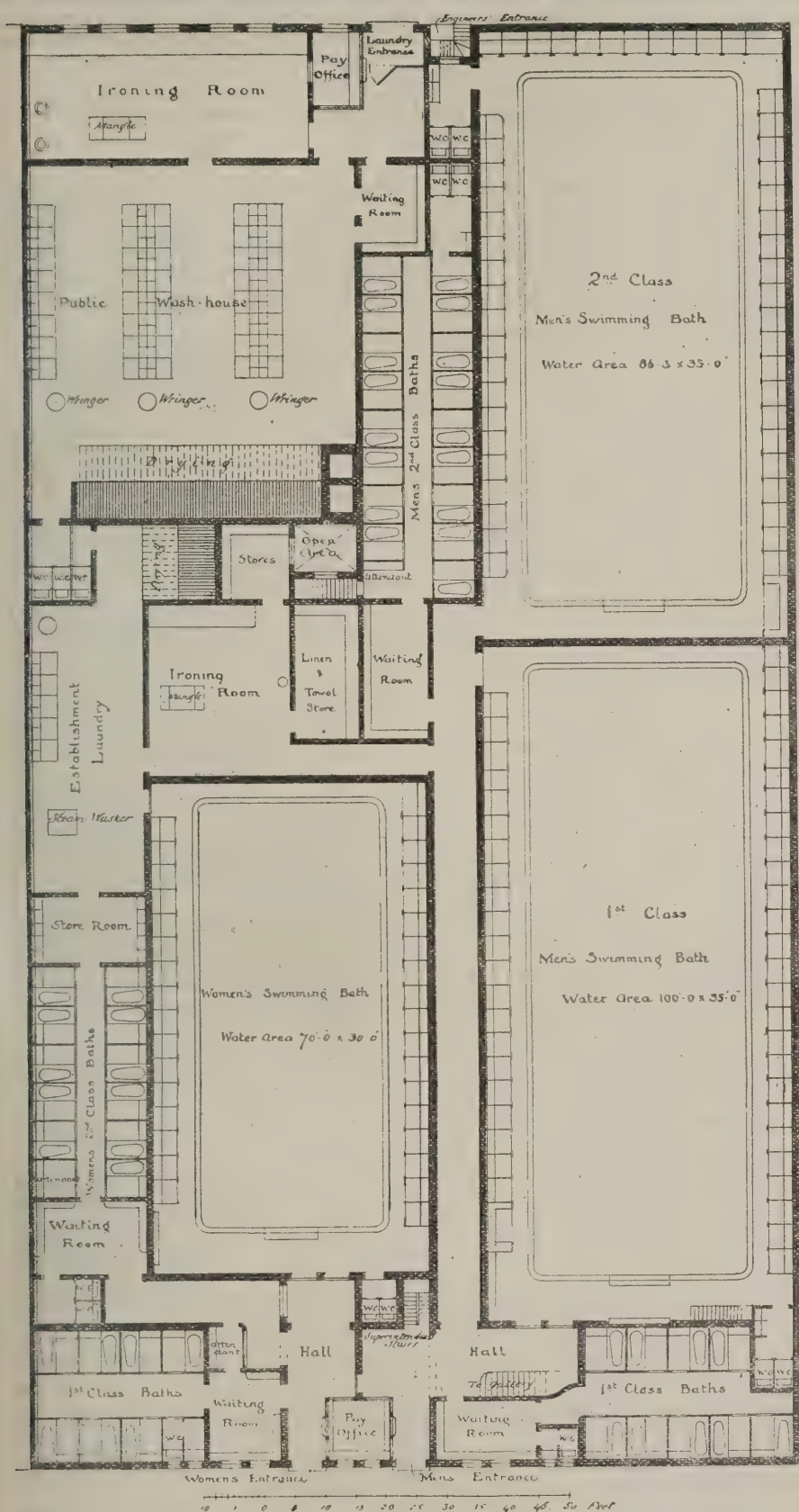
By R. OWEN ALLSOP, Architect.

Author of "The Turkish Bath," and "The Hydro-pathic Establishment and its Baths."

THE position of the site, and nature of the immediate neighbourhood, has, or should have, much to do with the scope and style of the public baths establishment. It is evident that a bath-house suited to a district wholly inhabited by a poor class of residents will not prove what is wanted in a place where are a number of comparatively well-to-do people. Baths Commissioners should more thoroughly study this question of site and surroundings. A grand swimming-bath, for example, is not required among a poor community. For such a neighbourhood a large area of the site may safely be devoted to the wash-house, it being found that, with many poor persons in the locality, the public laundry is always well patronised. In a wealthier neighbourhood the wash-house is but little used. The first-class swimming-bath, on the other hand, will be freely used; and as the price authorised to be charged warrants some little expenditure on the comfort and appearance of the bath, it may be built with some pretension to architectural effect.

In the general scheming of the plan of a public bath-house the swimming-baths will be found to be the chief governing factor. Being, in these days, of such extensive size, their position decided upon, a key is formed to the remainder of the plan, which, broadly speaking, consists of the various corridors and blocks of slipper-baths, together with the offices, waiting-rooms, and other necessary features. Having determined in which position, with regard to the site, the axes of the swimming-bath will best be placed, it must be ascertained that such an arrangement will conduce to convenient methods of approach and an economical and suitable

* An elevation of this tower appeared in our issue for Feb. 20, 1895.



placing of the entrance halls, pay-offices, waiting rooms, &c. The latter may be of no great moment, but every importance should be attached to the methods of approach and the position of the pay-offices. The first aim should be to concentrate as much as possible, to bring as many bathers as may properly be brought in at the same entrance door, so that there may be a minimum of attendance required in the way of ticket-giving.

Two principles may be followed in this matter. Firstly, the classes may be grouped, and the men and women bathers enter at or near the same point; and, secondly, the male and female bathers can be provided with separate and

distinct entrances, both classes of men entering one door, and the women by another entrance. Baths have been erected on both principles; but a modification of the first is the most to be recommended. The separation of the entrance for the sexes is a desirable thing in all bath-houses; but no less desirable is the separation of the classes. It has been found by experience that many of the poorer bathers do not care to enter at such an imposing entrance as is sometimes provided for first-class bathers; and anything that will deter the poor from availing themselves of the baths is to be avoided.

A first-class entrance and a second-class entrance is, therefore, the arrangement to pro-

vide. One pay-box at either entrance will control both men and women bathers. Although men and women are thus grouped together, it is not necessary that they should enter by the same door. On one side of the pay-office will be the entrance for men, and on the other side the entrance for women.

The laundry entrance is, as a rule, better kept distinct from the other entrances. It may, for economy's sake, be one with the entrance to women's second-class baths; but, if possible, it should be separate, as there is so much work occasioned by this department that one clerk's time is required to control the coming and going of the washers.

Site has much to do with the question of entrances. A side street for second-class entrances, and for access to laundry and to boilers, &c., is a very great gain. Commissioners searching for sites might well bear this in mind.

Where, as so often has occurred in London, a narrow, cramped site is the only one available, much skill is required to make the entrances convenient. The whole of the bathers' entrances may have to be grouped into one, men entering on the one hand of the pay-office and women on the other, as in the accompanying illustration, while stokers, engineers, &c., may have to make their way through the laundry entrance.

It is a common practice to make the first-class swimming-bath directly from the hall or vestibule. By this means direct access is gained to one of the most busy departments of the establishment, and provision is made for times when the swimming-bath hall is used for the purposes of entertainment, or when swimming fêtes are held.

Adjoining the first-class entrances, waiting-rooms are required if the site will allow them to be placed in this position on the plan. These waiting-rooms are generally needed only for the slipper-baths, and should therefore be placed in convenient relation to these departments, or the corridors leading thereto. The second-class waiting-rooms will adjoin their respective suites of baths.

Near the vestibule should be the superintendent's office. The living apartments of this official are, as a rule, conveniently placed over the entrances, offices, waiting-rooms, &c., in front of the higher-pitched bath-halls, and giving height and dignity to the front elevation of the baths.

All bath-houses are better when planned on one floor. Some of the London establishments afford examples of baths on a first floor. Such will be found to be the case in some old baths in St. Pancras parish, and in the recently-erected building near Victoria Station, where also is a laundry on an upper floor, considerably elevated, and approached by a lift. A still more recent example is the establishment in the Caledonian-road. In this matter, again, site may necessitate such a contrivance as a first-floor set of baths in order to gain the requisite amount of accommodation on a given area; but the arrangement is to be avoided, if possible. Commissioners appreciating the value of public bath-houses will, even at some increased cost, endeavour to secure sites of such area that all the baths may be on one level.

The boiler-house must necessarily be planned in a basement, and the engines, machinery, furnaces of drying closets, engineer's shop, and coal and coke stores go with it. In deciding the position for the engineering department, the aim should be to select some part of the plan where the noise, heated atmosphere, dust, and other accompaniments of engines, &c., may not be a nuisance either to the establishment or to neighbours, and also where a chimney-shaft can be conveniently constructed. Except in very exceptional cases, nothing will be constructed under the swimming-baths. The boilers, &c., will therefore go under some other part of the establishment—commonly, the laundry and its necessary adjoining apartments. At times it may be absolutely necessary to gain room under a swimming-bath. In such a case the bath must be constructed like a tank, of riveted iron plates supported on columns, as at the St. George's Baths in Argyll-place; or of brick-in-cement rings on iron joists and brick piers, as at the handsome bath lately added by Messrs. Spaulding and Cross at the same establishment.

If more than one swimming-bath be required, and no sacrifice of convenience in working results, it is evidently a saving to group both bath-halls together, so that where one wall is carried up to receive the roof of one bath, it may serve also to carry the adjoining roof. Each swim-

ming-bath, it should be stated in passing, should be completely cut off from its fellows. The objections to the reverse arrangement will be readily perceived on examining any examples, such as that afforded by the out-of-date baths at Endell-street, Bloomsbury, and the otherwise excellent and compact public baths at Richmond, while many of the older establishments exhibit equally unfortunate arrangements. Not to mention other objections, the usually noisy second-class bathers render things unpleasant for those in the first-class bath.

Section XXXVI. of the Baths and Wash-houses Act stipulates that the number of baths for the labouring classes in public baths and wash-houses shall not be less than twice the number of baths of any higher class, if but one, or of all the baths of any higher classes if more than one, in the same building. And Section V. of the Amendment of July 2, 1847, makes similar provision with regard to washing-tubs—viz., that the number of washing-tubs or troughs for the labouring classes shall not be less than twice the number of the washing-tubs or troughs of any higher class, if but one, or of all the higher classes if more than one.

We do not find that, as regards the proportion of first and second class baths, the stipulations of the Act are generally observed. In buildings recently erected the proportion of baths is not in accordance with the provisions of the Act. Commissioners, apparently, have taken the matter into their own hands; but their action is possibly illegal. It may be that at times a different proportion of baths is better suited to the neighbourhood; but Section XXXVI. of the original Act is a wise measure calculated to prevent abuses, and to protect the interests of the classes for whose benefit the Act was brought into existence. As regards the proportion of washing-tubs of several classes, there being usually only one class and charge for the use of the public laundries, Section V. of the Amendment of 1847 calls for no comment.

In a well-planned bath and wash-house there should be a good division of departments, and a compact grouping of classes; corridors should be broad and entrances spacious. The access to swimming-baths, particularly to the first-class bath, should be as direct as possible, and if spare exits can be arranged they will be valuable for any entertainments that may be held in the baths. There should be an endeavour to render the work of supervision of baths as easy as possible, and the entrances and pay-offices should be so arranged as to economise attendance while not sacrificing the due consideration of classes and sexes. As to classes, if two only suffice all purposes, it is far better than three. A first-class swimming-bath at a charge of sixpence, and a second-class bath at twopence, answers all purposes. The first class baths should be large, and all baths should be light and well ventilated. There should be space everywhere for pipes, and no burying of pipes underground, and out of the way, where much trouble, expense, and annoyance are occasioned by efforts to reach them for repairs or alterations.

The accompanying illustration is a sketch-plan for an establishment for site, built in on both sides, but facing streets back and front. Just the ordinary accommodation is provided. It is supposed that one pay-office only has been required by the Commissioners, so both classes enter at the same door, women on the left and men on the right. A separate entrance to public laundry is arranged in the back street, where also is the entrance stokeries, boiler-rooms, &c., which would be arranged under the public wash-house and adjoining apartments. Above the halls, entrances, &c., could be arranged the superintendent's living-rooms, as well as his office and a committee-room. In other points the plan should explain itself.

GARDEN DESIGN AND ARCHITECTS' DESIGNS.*

MR. W. ROBINSON, F.L.S., in his little work under the above title endeavours to show by examples of gardens how absurd and inartistic the practice of clipping and aligning trees is, under the impression that such a style of garden harmonises with the architecture. Mr. Robinson refers to many Continental and British parks and

gardens to prove that the English garden is the most beautiful and artistic. We certainly agree with him. The formal gardenesque style, with its rows of straight beds and trees, has been carried too far by those who do not seem to understand the distinction between ignoring the architecture and formal garden design. There is no necessity to make straight lines of beds and trees, with the object of harmonising the lines of the grounds with the house, because the very conditions of art and nature are different; but there are often opportunities when the natural lines of ground are favourable, as when the ground is flat and the building is of a regular character to introduce a formal setting out near the structure. No doubt there is danger in this geometrical formality being carried too far beyond the confines of the terrace or flower garden, and into the details and arrangements of the beds, and only the true landscape gardener can see where the formal setting-out should stop. Take, for example, Haddon, with its terraces, and many other old English gardens. They are eminently appropriate and beautiful. Mr. Robinson's main arguments are directed to rebut the statements of the authors (Blomfield and Thomas) of the "Formal Garden," and so far he has been successful. The beautiful illustrations of British gardens given confirm the author's opinion, though they do not necessarily disprove the formal style of planting or laying out. We agree with Mr. Robinson that clipped foliage and tortured lines of trees are unnecessary even to formal gardens, and that the natural landscape and contour of the ground ought to suggest the design. To contend that there are no design or lines in landscape is a fallacy.

RELIEF SEWER AT BROOKLYN.

THE main relief sewer of Brooklyn is an important engineering achievement, the results of which in preventing floods will be watched with some degree of interest. To carry away excessive storm-water has always been a problem with sanitary engineers. In London our great intercepting sewers and outfalls answer only moderately well, the difficulty being to find an easy outlet for the storm-laden sewers without a large expenditure of money in constructing relief sewers. Much has been accomplished, however, in relieving the sewers by the construction of independent outfalls, such as that of the Isle of Dogs pumping station and the relief sewer at Deptford. At the Brooklyn sewer the shortest egress to tidal water was given by making the outlet into a canal, which would rather improve the canal, as only the excess storm-water would be dealt with. The city was divided into sewerage districts, the boundary lines of which are the dividing ridges; each is distinct, the main sewers of each discharging into tide-water. The sewers are of various ages and materials, some of vitrified stoneware, of cement, brick, and stone. The drainage area is 2,000 acres, and it has been thought safe to provide for an area of 1,300 acres. The maximum rainfall of Brooklyn is 4in. per hour, lin. of which it is imagined will reach the relief sewer. The sections of the sewer are various, according to circumstances, the circle was adopted as the strongest for loose material, and of least resistance to the full flow. Where there is no head room the crown is replaced by I-beams. At its upper end the sewer is 10ft. diameter, further on it is increased to 12ft. in diameter, at the Grand Avenue it is 14ft., and at a more advanced point 15ft. diameter. A segmental invert, vertical side walls, and a flat top of I-beams, with flat brick arches between is the section in Butler-street, just giving head-room for a row of eight persons abreast, as shown by a photograph in the American Society's *Transactions*. At the different avenues manholes are introduced and put in connection with the surface sewers. The object in every case is to avoid disturbing the house-drainage of the small sewer, only to take from it all water in excess of that from house-drainage. The overflow in one case is oval-shaped, with segmental invert 4ft. 2in. in clear height, and this slopes down from the small sewer to the bottom of manhole just above the tunnel, so that the excess water drops vertically into the relief sewer, the invert of which at these points are paved with granite blocks; the granite is laid on cement and up to the springing lines. The details of these connections of surface sewers and manholes are shown in the elaborate paper of Mr. Beahan,

M. Am. Soc. C.E., which appears in the *Transactions* of the Society, as well as those of the silt or trap-basin at the canal into which the tunnel discharges, a basin 84ft. by 60ft. and 16ft. high. The main relief sewer is stated to have been well planned, and works satisfactorily.

CHIPS.

Messrs. Campbell, Smith, and Co. have just completed a very elaborate scheme of decorations on the grand staircase at the Hotel Métropole, Brighton, under the superintendence of Mr. A. Waterhouse, R.A. The scheme of ornamentation is based on a free adaptation of Italian ornament, containing shells, dolphins, seaweed, anemones, &c., and the colouring is cream, various tones of red, and gold.

The local board of Pudsey, near Leeds, are about to carry out works of sewage treatment on some 3½ acres of land recently purchased at Houghside. Mr. W. Spinks, of Manchester, is the engineer, and the estimated cost is £3,000.

Messrs. W. and G. King, of Abinger Hammer, have been engaged for some three years in carrying out extensive alterations at Hatchlands, the seat of Mr. Stuart Rendel, M.P., near Guildford. These works are now nearly completed.

The Pendref Welsh Wesleyan chapel at Holywell, erected 80 years ago, has been closed this week, as it is about to be replaced by a modern one to be built at a cost of over £2,000. The contractor is Mr. Richard Jones, of Bagillt.

Lord Roseberry has intimated to the Queensferry town council his desire to build a new town hall for the burgh, as a memorial of the late Countess.

Good progress is being made with the branch Free Library at Spring Hill, Birmingham, which is being built at a cost of £5,000. It is of brick and terracotta, with high tiled roofs, a feature being the clock tower, with openwork spire, rising to a total height of 65ft. The style is Decorated Gothic.

The St. Alban's Architectural and Archaeological Society visited, on Thursday in last week, Northchurch and Aldbury, as the two first items in a day's excursion, which comprised also Ivinghoe, Eddlesborough, and Eaton Bray. At Northchurch Mr. S. Flint Clarkson, F.R.I.B.A., acted as guide, and read a paper dealing with the history and characteristics of the church.

Mr. Richard Bristowe, aged 47, a builder, of Stroud Green, died suddenly on Saturday afternoon while driving with his son in a dogcart. At the inquest, held on Monday, the medical evidence showed that death resulted from heart-disease.

Mr. Hugh Owen, an inspector under the Local Government Board, held an inquiry at Widnes on the 16th inst. into an application by the Widnes local board for powers to borrow £12,000 for public and private improvements in the authorised district. The public improvement was the sewerage and construction of Lowerhouse-lane, which it was estimated would cost over £3,000, and the private works were in East-street and Edward-street.

The parish church of Pitstone is being restored. The works in the chancel are being carried out at the cost of Earl Brownlow, and those in the nave, which will cost £1,000, by local subscription. The contractor is Mr. W. Bone, of Lower Tooting. The works include the renewal of the boarding and lead of roofs, the replacing of the decayed flooring in the nave by wood blocks set in concrete, and the substitution of stone for brick parapets.

The sea defence works at Walton-on-the-Naze were formally inaugurated on Wednesday week. These works, which were commenced eighteen months ago, comprise the erection of two new groynes, the restoration of another groyne, and the construction of new breastwork and epiplanade, covering about 2,000ft. frontage. The cost has been about £12,000. The works have been carried out by Messrs. Cooke and Co., of Battersea, and Mr. S. B. Goslin, of 24, Artillery-lane, Bishopsgate, was the engineer.

It has been decided to complete the Roman Catholic Church of St. John at Perth, at an estimated cost of £1,000, as a memorial to Dr. Rigg, the first Bishop of Dunkeld. The works will include raising the roof over the older portion of the church, and the completion of the apse. Mr. Andrew Heiton, of Perth, who added the last section of the church, is the architect.

Oxwich parish church, Gower, Glamorganshire, was reopened on Sunday, after complete restoration, the cost of which has been defrayed by Miss Talbot, of Margam Park, to the memory of her father, Mr. Christopher Rice Talbot, M.P., the late father of the House of Commons. The work of restoring Nicholaston Church is proceeding, the cost of which, estimated at £3,000, being also borne by Miss Talbot. The architects for both works are Messrs. Halliday and Anderson, of Cardiff and Llandaff.

*Garden Design and Architects' Gardens: Two Reviews, illustrated. By W. ROBINSON, F.L.S. London: John Murray.

CONTENTS.

The Report of the Select Committee on Theatres	273
Latent Weaknesses of Structures	275
Iron in Architecture	276
Stability of Walls on Soils.—IV.	277
Decorative Lighting and Ironwork	278
Land Surveying and Levelling, and the Testing, Adjustment, and Use of Mathematical Instruments	278
The Architectural Association Excursion.—III.	279
Public Baths and Wash-Houses.—II.	280
Garden Design and Architects' Designs	282
Relief Sewer at Brooklyn	282
The Building News Directory	283
Our Illustrations	283
Competitions	283
Architectural and Archaeological Societies	283
Engineering Notes	283
Wayside Notes	302
Building Intelligence	302
Steel in Construction	303
Obituary	303
Correspondence	304
Intercommunication	304
Legal	305
Legal Intelligence	305
Water Supply and Sanitary Matters	305
Our Office Table	306
Trade News	307
Tenders	308

ILLUSTRATIONS.

"EVERSLEY," FRODSHAM, SURREY.—ARCHITECTURAL ASSOCIATION EXCURSION SKETCHES, COMPRISING ST. MARY'S CHURCH, TAUNTON; BISHOP LYDEARD CHURCH; POUNDISFORD PARK; BLACKMORE FARM, SOMERSETSHIRE; BOWER FARM, DUBLIN; AND GOTHELSTONE MANOR.—PREMISES AT LIV.—LVII. BISHOPSGATE-STREET WITHIN.—PROPOSED COTTAGE HOMES, SURREY.—DECORATIVE LIGHTING AND IRONWORK BY MESSRS. RASHLEIGH, PHIPPS, AND DAWSON.

Our Illustrations.

"EVERSLEY," FRODSHAM.

THIS house has just been erected on a hill side to the south of Frodsam. The windows command magnificent views of the Weaver Valley, a very picturesque portion of Cheshire. The work has been carried out very satisfactorily by Mr. Richard Beckett, of Hartford, from the designs of Mr. William Owen, F.R.I.B.A., of Warrington.

ARCHITECTURAL ASSOCIATION EXCURSION SKETCHES.

THESE sketches illustrate churches and houses seen by the members of the Architectural Association during the later days of last week's excursion to Taunton and North-west Somersetshire. They are all referred to in our special descriptive report of the proceedings on p. 279.

LIV. TO LVII. BISHOPSGATE-STREET WITHIN.

THESE premises, now approaching completion, have been erected on the site formerly occupied by the premises of the Marine Society, and cover an area of 7,000 super. feet. They comprise basement, ground, first, second, third, fourth, and fifth floors, all approached by a stone staircase and hydraulic passenger lift. The ground-floor front is in red and grey granite, and the whole of the upper part of the front is in Portland stone. The carving has been executed by Mr. Gilbert Seale. The works have been carried out by Messrs. W. Brass and Son, at a cost of £21,000, from the designs and under the superintendence of Mr. T. H. Smith, architect, of 17 and 18, Basinghall-street, E.C.

DECORATIVE LIGHTING AND IRONWORK.

(See article on p. 278.)

The name of Mr. C. J. Ferguson, F.S.A., F.R.I.B.A., of Carden Lodge, Carlisle, has been added to the commission of the peace for Cumberland.

Mr. F. H. Tulloch, one of the inspectors of the Local Government Board, held an inquiry at St. Mary's Hall, Coventry, on Friday, as to an application by the city council for sanction to borrow £1,200 for erecting a room for the preservation of the city muniments. It was stated that there was an exceptionally rich collection of muniments, the present accommodation for which was very inadequate, the rooms being by no means fireproof, and forming part of the old building of St. Mary's Hall. Plans had been prepared by Mr. E. Burgess.

COMPETITIONS.

NEWCASTLE-ON-TYNE.—The town improvement committee of the city council have adopted conditions prepared by Mr. W. G. Laws, the borough engineer, for the proposed lodging-houses. Premiums will be offered, and the competition will be restricted to architects practising in Newcastle.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The forty-ninth congress of this association was opened at Cardiff on Monday, under the presidency of the Bishop of Llandaff. A visit was paid to Llantrithyd, where Mr. Mansel Franken described the ruined mansion-house. Mr. S. Williams conducted the party round the ruins and to the adjacent church, where there is a monument to John Bassett and his wife, Elizabeth, erected to their memory in 1597. Mr. Edwin Seward, R.C.A., pointed out the peculiar classic treatment in the details of the Jacobean carving of the tomb. The tower of Cowbridge Church was then inspected, and the ancient gateway and fragment of the town hall were pointed out to the party by Mr. Franken. At St. Quintin's Castle the gateway, c. 1310, was seen to be fortified after the Edwardian manner, with loopholes on either side for four cross-bowmen, an arrangement found also at Carnarvon and elsewhere. The party proceeded to Llanfihangel, where Mr. Williams pointed out the chimney-piece of the mansion, date about 1550, ornamented with carved coats of arms of successive owners. The church tower close by is furnished with narrow slits for archers. Here the old font, the base stones of a churchyard cross, and the quaint effigy now in the churchyard, but formerly in the church, attracted attention. A short halt was made at Flemingstone, and the porch at old Beaupré was described by Mr. E. P. Loftus Brock and Mr. Seward. The members received a public welcome from the Mayor and Corporation of Cardiff on Tuesday. Mr. Allan Wyon, F.S.A. (treasurer of the Association), and Mr. Loftus Brock, one of the hon. secs., spoke in acknowledgment. The members afterwards proceeded to Margam Abbey, where a paper was read by Mr. Brock descriptive of the Chapter-house of the Abbey; and the unique collection of inscribed stone crosses was spoken upon by Mr. T. H. Thomas, R.C.A. On Wednesday the members had an excursion by road to Ruperra Park, where the owner, Lord Tredegar, acted as guide, and led the way to some prehistoric mounds; to Caerphilly Castle, described by Mr. Robert Drane; and to Castell Coch, rebuilt for Lord Bute on the foundations of a Mediæval castle. A visit to Llandaff Cathedral was on the programme, but was abandoned in favour of tea and a garden party at Rookwood House. In the evening a meeting was held at the Town Hall, Cardiff, where papers were read by the Rev. H. Gart and the Rev. W. David.

The interior of Lloyd's (late Bristol and West of England) Bank, in Corn-street, Bristol, is in course of restoration, the work being carried out by Messrs. Cottrell and Wilkins, under the superintendence of Mr. H. J. Williams, architect, Clare-street, in that city.

The chancel of the parish church of Llandyfodwg, diocese of Llandaff, is about to be restored. The work will include a new oak roof and stalls. The tower arch, built up in 1870, will also be done up and carefully repaired. Messrs. Halliday and Anderson, of Llandaff and Cardiff, are the architects.

The new water supply for Pontefract, derived from springs at Roall, has just been inaugurated. It has been carried out by Messrs. Vickers and Son, of Nottingham, the engineer being Mr. G. Hodson, of Loughborough.

The first stage of deepening the natural harbour of Aden to a depth of 20ft. below low-water has just been completed. The second stage of the deepening will be carried out to a depth of 26ft. below low water, and will commence forthwith. The dredging operations were commenced in December, 1890, under the supervision of Mr. W. S. Child, A.M.I.C.E., who has also charge of the works about the harbour.

On Tuesday, a new Wesleyan chapel was opened at Harpham. The building had been erected from plans prepared by Mr. Dyer, Bridlington, by Mr. Owston, bricklayer, Bridlington Quay, and Mr. Day, joiner, Harpham, at a cost of £500.

Engineering Notes.

HELMSDALE, N.B.—The foundation-stone of the works for the improvement of Helmsdale Harbour, on the east coast of Sutherlandshire, was laid by the Duke of Sutherland on Saturday. The works in progress include a new breakwater on the south side of the river, extending in an easterly direction for a distance of 700ft.; an extension of the existing pier on the north side of the river for 470ft.; a new breakwater and quay wall 450ft. long. This breakwater and extension will inclose about three acres, which will be divided into an outer and inner basin by a jetty, with discharging berths on each side. The works have been designed by Mr. James Barron, M.Inst. C.E., Aberdeen, and are estimated to cost £16,000. The trustees will execute the works under the superintendence of the engineer without a contractor.

ST. HELEN'S AND LOWTON RAILWAY.—Good progress is being made with the construction of the first section of the proposed Liverpool, St. Helen's, and South Lancashire Railway. The section extends from Lowton to St. Helen's, and upon it the contractors, Messrs. S. W. Pilling and Co. of Manchester, have some 500 men at work, besides two steam navvies and the usual plant. The line passes over an extensive coal-field, and there will be intermediate stations at Golborne, Ashton-in-Makerfield, and Haydock, between Lowton and a central station in Corporation-street, St. Helen's. This section of the line is to be opened for passenger traffic next year. The railway will eventually be carried on to West Derby and Liverpool, with stations at Denton's-green, Knowsley, and Croxteth Park.

CHIPS.

During the past week the booking-offices, waiting-rooms, and station master's residence at Frodsam railway station, weighing some 400 tons, have been moved back bodily 6ft. by means of eleven screw-jacks. The operations were carried out under the superintendence of Mr. Johnson, the engineer to the joint companies, and were quite successful. The work was undertaken to provide additional width on the platform.

Canon George Venables, in a report on Church work in the diocese of Norwich, states that during the last 18 years 297 churches have been built or restored in the diocese, the money raised for the purpose, entirely by voluntary gifts, exceeding £500,000.

An American patent has been taken out by Jacob D. Graybill, of Shreveport, Louisiana, for preserving the colour of brickwork by preventing efflorescence. The preparation is said to fill the pores of the bricks with an oily mucilaginous substance which, when dry, is hard and waterproof, preserving the brilliant red colour of pressed bricks as when first laid, there being in the compound a small quantity of Venetian red.

The parish church of Llanwouno, diocese of Llandaff, is about to be restored. The work will include oak roofs throughout and reseating. A vestry will also be added. Messrs. Halliday and Anderson, of Cardiff and Llandaff, are the architects.

The Leeds school board have decided to invite competitive designs for plans for the proposed new schools in Darley-street. The competition is to be limited to architects practising in the borough of Leeds.

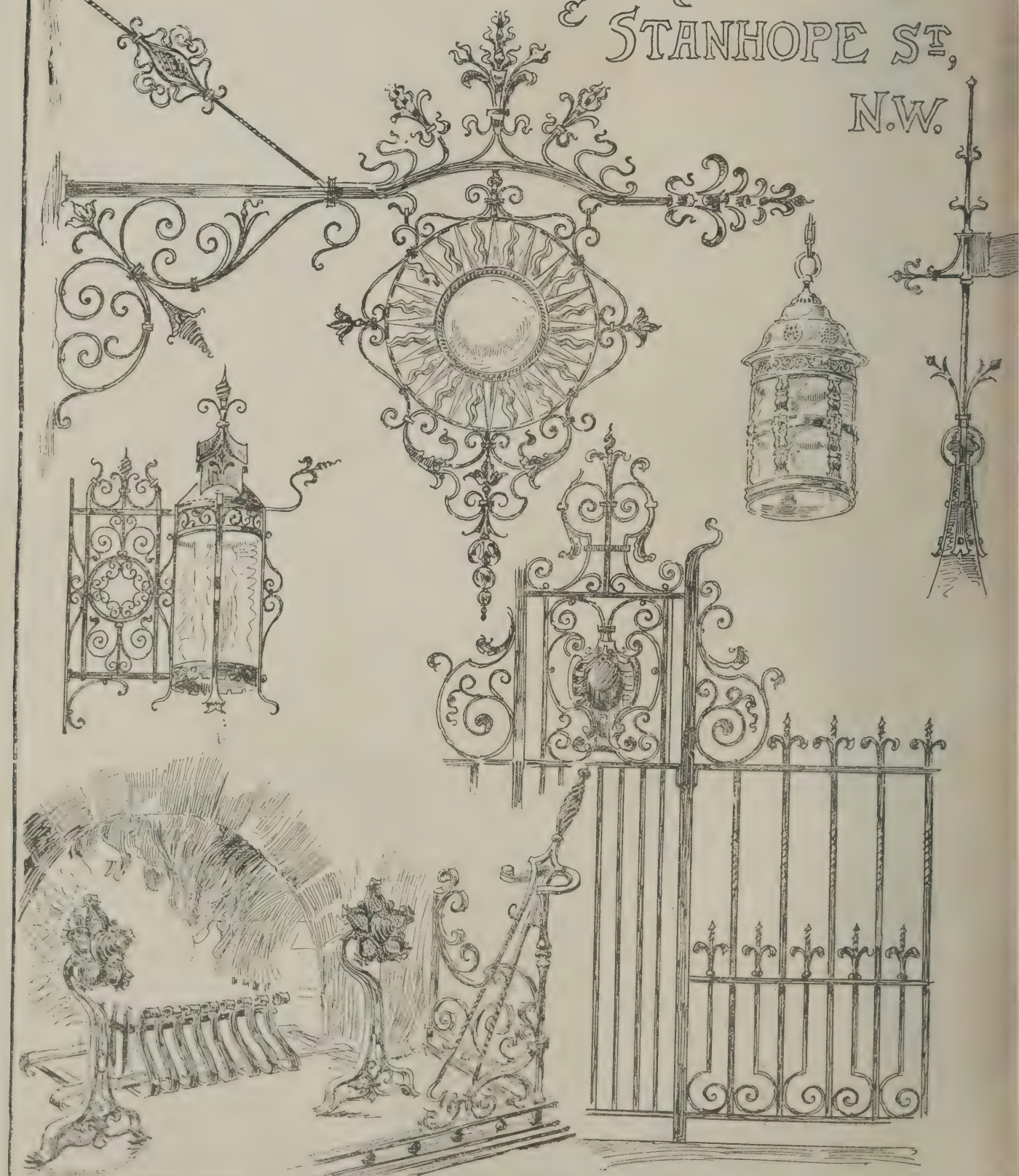
Memorial stones of a Wesleyan school in course of erection adjoining the chapel in Garfield-road, Ryde, were laid on Thursday, the 18th inst. Mr. Boreham, of Finsbury-pavement, E.C., is the architect, and Mr. E. James, of Binstead, I.W., the contractor. The cost will be £1,500.

At the Bristol police court on the 17th inst., Mr. George Henry Wilkins, builder and contractor, was summoned under the Factory Acts for opening a factory or workshop without forwarding a notice containing the name of the factory, its situation, and other particulars to the authorities, as prescribed by the Act. Mr. Johnson, Inspector of Factories, stated the facts, which were admitted, and the defendant was fined 10s. and costs.

The new public buildings at Bodmin will be opened in October next. Mr. Trehane is the contractor.

Mr. Richard Halfnight's landscape, "Summer Time," has been purchased by Mr. Backhouse, and presented to the Sunderland Art Gallery. It forms a contrast to "Daylight Dies," an earlier work by the same artist, already in the collection of the Sunderland corporation.

Examples of Work executed by
RASHLEIGH PHIPPS & DAWSON
of 53 BERNER'S ST W.
& STANHOPE ST,
N.W.





WAYSIDE NOTES.

THE Association have been having glorious weather for the excursion in north-west Somersetshire, and the touring members should return to town with faces as full of colour as their sketch-books of sketches. Judging from the accounts of the wanderings about Dunster and neighbourhood, the excursion has been one of the most successful undertaken by the A.A.

The Society of Architects should have had another excursion "up their sleeve." To relinquish the idea of going to the Continent, when hundreds are daily dropping down dead—or nearly so—with a plague of cholera was only exercising wisdom; but surely there might have been another excursion in England, Ireland, or Scotland, not to mention Wales, which would have been a good substitute for the abandoned Continental tour. The old country still provides a practically inexhaustible fund of old architecture for excursionists, and really, I expect, home tours prove the most generally pleasing, and afford instruction not inferior to that obtained in any part of the Continent.

The usefulness of a tour of this nature should depend upon the particular fashion in architecture at the time of touring. Thus we hear so much now of Spanish—it should be, perhaps, "Spanish" detail—that a tour in Spain should be a profitable undertaking, particularly for the competing architect, since this Spanish craze seems to have been particularly noticeable in recent competition designs. The Dutch and Flemish mania having somewhat worn off, touring in Holland and Belgium cannot be said to be so profitable as heretofore, although these countries always repay a visit by the architect. Normandy seems to me the country *par excellence* for a sketching tour. There one finds matter for sketching and study that must always be useful to the architect, since most of the old architecture is intrinsically beautiful, and admiration for it does not depend upon peculiar tastes and fashions and crazes. This is a point to be noted—Dutch, Spanish, and some other styles of design may be admired one day and derided the next. The younger students of architecture should always be encouraged to go sketching in a country with a really noble architecture, and to defer visiting districts with less pure styles until their judgment is more mature.

Endeavours are periodically made to make out that the plays of Shakespeare are written by anyone but Mr. W. S., and so likewise the reputation of other authors, discoverers, &c., is assailed. Some persons appear to make this kind of game their special recreation, and it is to be supposed that they are of some use in the world, and have their reward. The latest in this way is an attempt to rob the great Christopher Columbus of the merit of first discovering America to the Old World. M. Napoleon Ney, president of the Society of Commercial Geography of Paris, takes advantage of this year's celebration of the fourth centenary of the discovery of America by Columbus, and puts in a prior claim for the French, averring that 800 or 900 years ago the coast of North America, as far as the Arctic regions, was visited by Europeans. M. Ney reminds one of the persons who argue that Stephenson did not invent the locomotive. To all practical intents and purposes he did do so, and Columbus, for all practical purposes, first discovered the continent of America. A more interesting and useful subject of inquiry with respect to pre-Columbian days in America would be the nature of the old ruins in Central America that heretofore have baffled the archaeologists of the world.

A feature of the Chicago Exhibition will be a great hotel in the shape of an elephant. A "howdah" on the back of the elephant will serve as an observatory, and will be two hundred feet above the ground. This elephant hotel will contain lodgings for about seven hundred people, and its erection is to be commenced in a few days. What next? A church in the shape of a cat might be suggested, its erect tail forming the tower and steeple. This is novelty indeed, not to say architecture extraordinary.

Mrs. G. A. Sala, the wife of the renowned author and journalist, has been writing against

the London "flat." Not ever having lived in a dwelling of this kind, I cannot speak from experience; but from observations made, I should be quite of Mrs. Sala's opinion as to the delusive nature of the comforts of such places, and the superior delights of possessing a tenement of one's own, even if the hall-porter be unknown therein, and letter-shoots and other conveniences of the flat altogether wanting. That the "flat" system of living answered for a time there is abundant evidence in the huge blocks of residences in London at the present day. How the holders of flats now find things I do not know; but one can see many buildings practically empty, that must be white elephants to their owners. I doubt whether it is found that flats let on a long term, and should imagine that the suites of rooms change hands very frequently, and that were it not for the large floating population of London, their owners would be great losers. Mrs. Sala thinks that not the tenements, but the people who take them, should be called "flats." It may be a matter of taste, but to those with a real love for a home, the flat must seem but a poor substitute for a house that may be called one's own.

The flat builder may be said to be a common enemy of all architects. Between those who put together overgrown suites of rooms on the flat-system in London and the speculative builder who runs up desirable villas and houses in the more outlying suburbs, the architect is deprived of much work. In the one case it is direct, in the other indirect. Men provided with flats will not want to build themselves houses, and those who do cast about for a domicile of their own frequently get into the net of the jerry-builder, and buy a shoddy house ready made. Later on, perhaps, many such a one finds out that neither the flat, with its bad odours, and lifts, or long flight of steps, and other drawbacks that Mrs. Sala has ably detailed, nor the jerry-built house, with its defective drains, thin walls, and shrunken joinery, are calculated to give a sense of home comfort. Then is the time when the architect "takes his benefit," and paterfamilias builds himself a house after his own heart. Possibly, therefore, the flat and the jerry-built house ultimately do good to the architectural profession by causing men—who, did they chance upon a well-built house, or a flat having really the comforts that such a residence is supposed to have, would settle where they alighted—to leave their dwellings and build homes for themselves.

GOTH.

CHIPS.

Sir James Sawyer, M.D., gave a house-warming reception last week to celebrate the completion of the alterations he has effected to Haseley Hall, near Warwick, which, since he purchased it, he has refitted and enlarged from plans by Messrs. Wood and Kendrick, of West Bromwich. It is now a mansion of Early Elizabethan character, a chief internal feature being a new oak staircase. Mr. Rowbotham, of Birmingham, was the builder.

Work in connection with the enlargement of the Wesleyan chapel in South-street, Farnham, Surrey, has commenced, the contract being secured by Mr. H. Patrick. There will be a new front and a tower 60ft. high erected.

The city council of Manchester, after much discussion, have decided to purchase for £49,000 the Rampton Manor Estate, Nottinghamshire, covering 1,800 acres, for the purpose of dealing therein with the refuse of the city.

In the case of the application for a discharge from bankruptcy, made on behalf of John Coleman, of Hubert's-grove, Stockwell, builder, the discharge has been suspended for two years and six months. A similar order of suspension of discharge for 2½ years has been made in the case of Robert Humphry, of Hove, late of Burgess Hill, Sussex, builder.

The post-office at Woodbridge has just been enlarged by an additional floor, and the interior rearranged. Mr. Adams, of Woodbridge, was the contractor.

Mr. Ernest H. Johnson, late a district surveyor of roads under the Norfolk County Council, has been appointed surveyor to the Condover highway board in the stead of Mr. Hendry, resigned.

The first sod of St. Anne's-on-the-Sea drainage scheme was cut on Thursday in last week. The scheme is from plans by Mr. Bancroft, engineer, of Manchester, and the work is being carried out by Mr. Nuttall, contractor, of Manchester, at a cost of about £9,000.

Building Intelligence.

EDINBURGH.—Considerable improvements are being effected to various public school buildings in the city. The School Board, from plans prepared by their architect, Mr. R. Wilson, Queen-street, Edinburgh, are making an addition to the south-west end of South Bridge school, to provide three class-rooms, the upper one to be set apart for teaching practical cookery. The alterations will cost about £1,900. New practical cookery rooms are also being constructed, from Mr. Wilson's plans, at Causewayside and Dean schools, while other rooms are being turned into practical cookery rooms at West Fountainbridge and Bristo schools. At Lothian-road school and at Regent-road school, boys' playsheds are being erected. For the St. Cuthbert's and Dean School Board, a janitor's house has just been completed at Gorgie, and their new school at South Morningside is expected to be opened on 5th September. For the Merchant Company, extensive additions are now in progress at George Watson's College for Boys, the plans for which were prepared by Messrs. Macgibbon and Ross, Frederick-street.

LINLITHGOW PALACE.—The partial repairs and improvements, which are being carried out by H.M. Office of Works at Linlithgow Palace, are being rapidly carried through, and the work is expected to be completed towards the end of the present month. The floors of the apartments known as the King's kitchen, the old Parliament hall, the chapel royal, the priest's residence, and the confessional have been laid with concrete. All the chimneys on the north side have been rebuilt, and a new course of drainage has been laid, a connection having been obtained with one of the original earth closets.

WEMBLEY: THE PROPOSED LOFTY TOWER.—The report presented to the shareholders of the Tower Company, on Wednesday, stated that the foundations of the proposed tower had been constructed on the estate at Wembley, Middlesex, roads, bridge approaches, and an ornamental lake formed, the grounds carefully laid out, drained, and planted, and the portions of the proposed tower grounds had been fenced in. Upon these works a sum of £25,436 had been expended, exclusive of the cost of the land. The Construction Company were now arranging to commence the tower works, and it was proposed to open the park for public use next spring. Sir E. W. Watkin, in moving the adoption of the report, said that the directors of the Tower Company had that morning made arrangements for the Wembley-park Station to be opened in a very few weeks. It had also been practically settled that morning the kind of tower which would be constructed. The proposed tower would be 150ft. higher than the Eiffel Tower. It would be a tower capable of taking up three times as many passengers as that one, and it would have three times larger an amount of floor-space, and be erected at a smaller cost than was at first thought possible. Some £90,000 were in hand, and about £12,000 to £14,000 more were required. Mr. H. Heenens explained the designs of the proposed tower, and it was stated that the plans would be reported upon by a very eminent engineer so as to remedy any defect in its design. The tower would be completed in 18 months.

WEST DERBY.—A new Roman Catholic cemetery for Liverpool is in process of formation in Yew-tree Park, Finch-lane, West Derby. It will consist of some acres, which are railed off and are being drained and laid out in plots, with intersecting pathways, by Messrs. Pain and Bleasde, of North John-street. Dr. O'Reilly, the R.C. Bishop of Liverpool, recently blessed the foundations and laid the corner-stone of the mortuary or cemetery church, to be dedicated to Our Lady of Compassion. It is being built by Messrs. Waring, of West Derby, from designs by Messrs. Sinnott, Sinnott, and Powell, of Harrington-street, Liverpool, and will be in the Early English style, constructed of local red stone rock-pitched, and Runcorn stone dressings. The church will be cruciform in plan, and the internal joinery will be of pitch-pine. It will be finished in about five months, and the estimated cost is £1,800.

A new English Presbyterian church is in course of erection at Mold, and will be opened in November. Mr. Thomas Roberts, of New-street, Mold, is the contractor.

STEEL IN CONSTRUCTION.

THE rapidly increasing favour with which steel is now regarded as a material for general construction, and the position which it is ultimately likely to hold, render a study of its nature and possibilities of more than ordinary importance. The various substantial advantages which may be gained by its use, in the matter of greatly increased strength, and consequent saving in "dead load," together with the greater facility in handling, make it more than likely that it will ultimately supersede both cast and wrought iron.

Objections to Use.—The greatest drawback at the present time to the general employment of steel is that the Board of Trade regulations prohibit a greater working stress than $6\frac{1}{2}$ tons per square inch. This amounts to an increase of only about 30p.c. over the 5 tons allowed for wrought iron, whereas if care is taken to procure the best material, it may safely be regarded as 50p.c. stronger. In the case of the Forth Bridge, this regulation was not insisted upon, and a working stress of $7\frac{1}{2}$ tons was allowed.

Another objection to the use of steel is that under ordinary circumstances it corrodes more quickly than wrought iron, and very much more so than cast iron. The comparative liability to oxidation has been given as follows:—Cast iron, 100; wrought iron, 129; steel, 133. Considerable variation may be caused, however, by the different corroding agents acting upon the material. A formula is given in Molesworth's "Engineers' Pocket-book," together with a table of the coefficients for the several agents, from which the results likely to occur under the various circumstances may be accurately arrived at. The fact should be borne in mind, however, that the result is to some extent dependent upon the quality of the metal. Mild steel will in every case corrode more rapidly than hard steel.

Terms of Specification.—In specifying for steel for ordinary roof and girder work, it is usual to insist that the metal shall be capable of sustaining a minimum tensile stress of 28 tons per square inch and a maximum of 30; that the elongation in a length of 8in. shall be 20 per cent., and that the contraction of area at point of fracture shall be 40 per cent. In addition to these requirements the limits of elasticity should be fixed at 15 tons, and the specific gravity (which in the case of steel is a fairly reliable test) at 7.9. With regard to the advisability of specifying the chemical composition and process of manufacture, there is at present some difference of opinion. In the report recently published by the committee appointed by the Society of German Engineers, it is stated that "the physical properties afford a sufficient index to the composition of the metal, and the result depends not only on the quantitative identification of the component substances, but also upon their mechanical combination." Further, respecting the method of production, "the committee are of opinion that the specification must be limited to such general normal conditions for the identification of quality as can indubitably be conformed to, and that any minute limitations are technically impracticable, without result, and commercially injurious." On the other hand, the Austrian Society of Engineers and Architects, after an elaborate series of experiments, have arrived at the conclusion that Siemens steel (basic process) is indisputably the best material for engineering purposes.

Quality of Steel.—The quality of steel generally used in construction is mild steel, containing a percentage of only 0.35 to 0.60 of carbon. The desirability of employing a softer material, even at the sacrifice of strength in positions where vibration takes place, need hardly be pointed out. Hence the advisability of fixing a maximum as well as a minimum strength.

Steel Rivets.—The fact of the shearing strength of steel being only about three-fourths of that of its tensile strength, whereas in the case of wrought iron the one is equal to the other, would make it at first appear that iron rivets are slightly stronger than steel, and it is by no means an uncommon thing to see it stated that iron rivets should be employed in steel structures on account of this superiority. The statement, however, is not well founded. The shearing strength of steel may be regarded as $5\frac{1}{2}$ tons per square inch as against 5 for wrought iron; in addition to which the fact must be borne in mind that the ultimate shearing strength of wrought-iron rivets when used in steel plates is reduced from 22 to 16 tons per square inch. The great objection to steel rivets is that, when fixed by hand, the heads

frequently split and fly off, as they do not retain their heat so long as iron ones, and the metal when worked at a "blue heat" is always unreliable. This rapid loss of heat is fully appreciated in riveting steel-plate boilers, as the spring of the plates having less time to act upon the metal while in a soft condition, the holes filled with steel rivets are less likely to "weep" than those filled with iron ones.

The shearing strength of steel rivets being smaller than the tensile strength of the plates, joints will require a larger rivet section than would be required with iron plates—the necessary section being proportional to the quality of the plates; consequently, the saving which is effected in the number of covers owing to the larger sizes in which steel plates can be procured compared with iron, is to some extent neutralised by their greater length.

The proportions of steel rivets should be larger than those usually adopted for iron ones.

Before leaving the subject of rivets it is perhaps as well to mention that in calculating rivet sections for either iron or steel, it is unwise to allow for the full working strength of the rivets, and, in actual practice, steel should be taken at 5 and wrought iron at $4\frac{1}{2}$ tons, for the reason that the stress frequently acts upon a group of rivets, some of which have to sustain a much greater stress than others.

Annealing.—The effect of annealing upon steel is the same as upon wrought iron. It increases its ductility while lessening its tensile strength. It therefore follows that though very useful for hard steel, it is, as a rule, unnecessary for the softer varieties. Steel plates $\frac{1}{2}$ in. thickness and over should, however, be annealed after punching, by which means the loss in strength and ductility is restored. Plates under this thickness do not need this precaution, the loss of strength being comparatively little.

In cases where punching is absolutely necessary and annealing cannot be done, the holes should be punched with a smaller diameter than required, and then rimed out.

Clauses of Specification.—The following clauses taken from a specification prepared in the Government offices will be found useful in specifying for steel work.

Strength and Quality.—The steel shall not fracture under slowly applied tensile stresses, or with elongation, less than are shown in the following table against each variety respectively:

	Tensile stress. Tons per sq. in.	Elongation in 8in. length.
Steel plates, bars, angles tees, and channels ...	(Max. 32) (Min. 28)	20 p.c.
Steel joists	(Max. 32) (Min. 28)	20 p.c.
Steel for rivets and bolts	(Max. 20) (Min. 26)	25 p.c.

Plates, Bars, &c.—Strips, $2\frac{1}{2}$ in. wide, cut lengthways or crossways, heated uniformly to a low cherry red, and cooled in water of 82° Fahr., must bend double in a press, to a curve with an inner radius equal to one and a half times the thickness of the sample tested without showing any signs of cracking.

Rivets and Bolts.—Steel rivets must bend double, when cold, on a radius of half their diameter, and when hot must close double, without cracking, and bolts must bend cold to 90° on a radius equal to their diameter, and when hot must bend double on a radius half their diameter, without cracking.

General Forge Tests.—Plates, angles, tees, or other sections shall also stand such forge tests, both hot and cold, as may be sufficient in the opinion of the inspecting officer to prove soundness of material and fitness for the service intended.

Treatment of Steel.—All plates, bars &c., required to be bent are to be bent cold if practicable. If the whole cannot be bent cold, as little as possible is to be heated. When plates, bars, &c., have been heated, no work is to be done upon them after their temperature has fallen to "blue heat," say, 400° to 600° Fahr. Should this limit be reached, the work must be reheated, and is not to be hammered cold on any account. Plates or bars which have been much worked hot, and which have been reheated, must be afterwards annealed, such annealing being done simultaneously over the whole piece when possible.

Castings, Annealing and Testing.—All steel castings to be carefully and thoroughly annealed by keeping them at 1700° Fahr. for 24 hours, and then

gradually cooling without being exposed to the air. Completed castings may be subjected to a percussive test, those weighing over 15cwt. each to drop 12ft., and those under 15cwt. to drop 15ft., without breaking, on to an iron slab firmly bedded. One casting in 50 may be tested.

In addition to the above, clauses relating to the following points should be inserted:—

1. Hydraulic riveting to be done wherever possible.

2. Members to be so placed that the fibres will run in the direction of the greatest strain.

3. All bending which may require to be done is to be effected by crushing, and not by hammering. S. H. DAVIES.

OBITUARY.

MR. FELIX JOSEPH, the well-known art connoisseur, died on Saturday at Southsea, aged 52 years. He had been in weak health for some time past. Mr. Joseph was a considerable authority on art generally, and especially on ceramics. Of the latter he possessed as fine a collection as could be found in England. He was born in London in 1840, and was the son of the late Mr. A. Joseph, a widely-known expert in matters relating to art. Mr. Felix Joseph was educated at Ghent, and subsequently joined his father in his business in London. On the death of Mr. A. Joseph, his son, who inherited a handsome fortune, retired into private life. Mr. Felix Joseph soon became an ardent collector of old Wedgwood ware, and his collection is now in the Nottingham Castle Museum, to which institution he had been a great benefactor since its opening in 1878. In recognition of his many services to art, and the high esteem in which he was held in the town and county, the Nottingham Corporation commissioned Mr. Knight Warren to paint a full-length portrait of Mr. Joseph to be placed in their Castle Museum, which was hung in Gallery V. of the late Academy Exhibition. Among the other provincial museums of which he was a benefactor are those of Maidstone, Norwich, Sandgate, and Derby.

CHIPS.

Another of the City churches is doomed—that of St. Mary Magdalen, Old Fish-street, which now has affixed to the door a notice to the effect that the site is to be let on a building lease; the architect is Mr. W. Wimble, of 9, Queen Victoria-street, E.C.

The Lord Chief Justice and Mr. Justice Cave, sitting in Queen's Bench, have granted a rule nisi for a mandamus to compel the corporation of Rochester, as the local sanitary authority, to carry out drainage works in the village of Borstal, the order having been made after inquiry by the Local Government Board inspector.

At the annual Congress of the British Institute of Public Health held in Dublin on Thursday in last week, Sir Charles Cameron presiding, a resolution was unanimously adopted in favour of the appointment of a Minister of Public Health, and recommending an immediate sanitary survey of the United Kingdom.

A bronze statuette of Minerva, only 4½in. in height, was discovered a fortnight since in the cloister garth at Lincoln Minster by the workmen engaged in making a drain to carry off the rain-water from the cloister roof. The goddess is represented as erect, clothed in a tunic without sleeves. Over the tunic she wears a cloak, and over that a chlamys. The breast is protected by an ægis, and the head by a crested helmet. The figure is perfect with the exception of the spear and shield once carried in the hands.

The firm of Messrs. J. Easton and Son, quarrymen, stone merchants, and masons, Exeter, a business established more than half a century ago, have found it necessary to extend their works. Their business having outgrown the accommodation provided in their old premises, Northernhay-street, the firm has acquired property adjoining, which extends up the street as far as Maddock's-row. On this site long ranges of sheds and workshops have been built, and the ground levelled.

The designs submitted by Mr. A. Savel for the east window of Llangynwyd parish church has been accepted, the subject being the Ascension. The same artist has been commissioned to execute the four-light west window—the subject the Four Archangels. Messrs. Halliday and Anderson, of Cardiff and Llandaff, are the architects for the restoration.

The saw-mills of Messrs. Jonas Brown, Brown, and Son, of Leeds, were completely gutted on Sunday night within an hour of the outbreak of fire.

Legal.

INSANITARY HOUSES.

THE old common law of landlord and tenant is still in force, so that even if a house be quite uninhabitable, the tenant must pay his rent all the same. Nor can he recover damages or compensation for injuries caused to the health of himself or his family by reason of the bad state of the drainage, unless he can show either an express warranty that the drainage was good by the landlord, or a knowingly false representation as to its sanitary state, by which he was induced to become the tenant. The result is generally that landlords and their agents decline to say anything at all specific about the state of the drains, and thus leave the intending tenants to find out for themselves, or to take the risk of entering into possession without any inquiry. The *Lancet* has just issued a very valuable report made by its own Special Commission on "Sanitation in Relation to the Law and Practice of House Letting," which contains much useful matter. Apart from the point of law that landlords should be made legally liable for the state of the houses they let upon the broad ground of principle and common sense that a house should be fit for its obvious purpose of sanitation, for the letting of a house should always carry an implied warranty that it was habitable, this report makes other suggestions.

Considered from a public point of view, the question ceases to be one for legal settlement merely between landlords and tenants as individuals, and becomes a subject for general legislation on behalf of the community. This commission therefore recommends that the desired improvement in house sanitation should be obtained in one or all of three ways—(1) By a combination of house agents and surveyors; (2) by further legislation; and (3) by making sanitary authorities employ the powers they already possess. No doubt surveyors can do, and are doing, a great deal in the desired direction, and are endeavouring to pass a more stringent statute; but to begin with, the existing Acts ought to be better enforced than they are generally. It appears that at Eastbourne the local authority has been granting certificates to owners who voluntarily submit their houses to sanitary inspection, and that this plan works very well indeed. Certainly it seems to be a simple and effectual method of using self-interest for the public good, and so is worthy of general imitation.

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NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

The syllabus of the courses on architecture and building construction for the forthcoming session of the Glasgow and West of Scotland Technical College has just been published. The lecturer, as in the past, is Mr. Charles Gourlay, A.R.I.B.A., of Glasgow. The new features of the present session include the division of the lectures on Architecture, previously forming one course, into four courses; and the honours stage course in Building Construction is extended, while the Art classes for architects are now conducted by Mr. Lewes R. Crosskey, art master. All the classes are arranged to suit the R.I.B.A. examination scheme.

The refooring of the nave of Manchester Cathedral and the erection of the new south porch and baptistry, now in progress, will not be completed until the beginning of October. In the mean time all the services, Sundays and weekdays, are being held in the choir.

At an inquest held at Stockport on Tuesday, on Joseph Sutton, aged 41, the evidence showed that Sutton was in the employ of Messrs. T. and W. Meadows, contractors, and whilst working on a ring spinning mill being constructed in Breinksway he fell from the top floor to the ground, and was killed. He was fixing the iron flooring, when he stepped on what was described by one of the witnesses as a "trap"—an opening between some loose planks which were in use as a standing place, being laid across the joists. The jury viewed the scene of the accident, and agreed with the coroner in urging that such a dangerous mode of working should not be allowed, but that the planks should be joined together, as loose boards were very liable to get out of place. A representative of the contractors agreed to recommend Messrs. Meadows to carry into effect the wishes of the jury and coroner.

LEGAL INTELLIGENCE.

IN RE J. G. ROGERS, PORTSMOUTH.—The statement of affairs in the failure of Joseph George Rogers, builder, and member of the Portsmouth Town Council, shows gross liabilities amounting to £23,714, of which £22,714 is due to secured creditors, whose securities the debtor estimates as likely to show a surplus of £4,110, which would more than meet the unsecured creditors' claims. The failure is the fourth of the kind due to the collapse of the Portsea Island Building Society. The debtor was a speculating builder who had been in business twelve years. He was formerly a journeyman joiner, and started without capital, but two years later received assistance from the building society secretary (who is now in custody), who continued to finance him nearly up to the time of the crash.

SINGULAR ACTION BY BUILDERS AGAINST ARCHITECTS.—In the High Court of Justice, recently, an action was heard before Mr. Kemp, an arbitrator appointed by Mr. Justice Charles, between Messrs. Hayward, Penton, and Hayward, builders, of Bournemouth, and Messrs. Brown and Gordon, architects, of Whitehall-court, City, to recover a sum of £350 in respect to architects' and surveyors' charges upon the recent enlargement of Bourne-hall, and the new wing and billiard-room. It appeared that Dr. Philpotts, as managing director of the Bourne-hall Company, had paid the defendants direct, as architects' fees, a sum of £662 9s., and that the defendants had drawn through the builders, on certificates issued by them, a further sum of £359 1s. 6d. The evidence for the plaintiffs was that the defendants were only entitled to five per cent. for fees, and certain other incidental charges, and the defendants, when asked to make a detailed claim, put in a sum of £225 for travelling and hotel expenses to and from London on the work at Bourne-hall, and other charges beyond their fees as surveyor, which plaintiffs were bound to pay, amounting to about £350. The case occupied two days in hearing, the witnesses examined for the plaintiffs being Mr. Penton, Mr. John Donkin, architect, of Bournemouth, Sir Arthur W. Blomfield, A.R.A., and Dr. E. P. Philpott. The witnesses for the defence were Mr. Darward Brown, Mr. Robert Griggs, F.R.I.B.A., and Mr. Thomas Frederick Armstrong, chartered accountant, of 89, Gresham-street, City, at one time secretary to Bourne-hall Company, until transfer and allotment. The arbitrator has since reported to Mr. Justice Charles that £237 15s. 8d. was to be returned by the defendants to the plaintiffs, and a verdict has accordingly been entered with costs against the defendants.

IN RE T. E. THORPE, OF BRIGHTON.—At the Brighton Bankruptcy Court, on the 18th inst., before Mr. Registrar Jennings, Trayton Edward Thorpe, Victoria-street and Marlboro'-street, Brighton, builder, presented himself for his public examination. The statement of affairs showed gross liabilities, £1,616 17s. 2d., of which £574 5s. 8d. was expected to rank for dividend. The assets were put at £394 17s. 8d., leaving a deficiency of £179 8s. In reply to the Official Receiver (Mr. Cully), the debtor said he commenced business in 1870, taking jobbing work. He had practically no capital. He commenced to take contracts about 1876, and, of late years, finding that hardly any jobbing work came in, he tried speculative building, the ground landlords advancing money. He attributed his failure to pressure of creditors, slight loss for under-estimating, and inability to realise the property he had built. The examination was closed.

AN ARCHITECT'S FEES.—At the Derby County-court on the 18th inst., John Nuttall, architect, claimed the sum of £18 3s. 1d. from Mrs. E. Goodwin, of Ashover, for professional fees. The defendant ordered plans for a house and cottage, and these not meeting with her approval, another set was prepared. Defendant admitted the charge; but said she had not the money with which to pay the bill, as it was in the hands of her lawyer.—His Honour said she appeared to have been building to the extent of £229 on one contract, and she would have to pay this claim.—Defendant said she had not a half-penny coming in, as the property was sold, and it had only left her an annuity.—Judgment for the plaintiff for the full amount.

IN RE TURNER, SON, AND EVANSON.—In this case the debtors, who carry on business in partnership as contractors at Stanley Bridge Wharf, Chelsea, have filed accounts showing liabilities of £13,792, of which £8,551 is expected to rank, and assets £2,648. The business was established about 40 years ago by Mr. Thomas Turner, who in 1886 was joined by his son, Mr. Arthur Turner; and in June, 1891, Mr. F. M. Evanston joined the firm. The debtors attribute their insolvency to losses incurred in connection with a contract taken by them for the construction of Rosebery-avenue, also to their drawings for household and personal expenditure, and to depreciation in value of stock and machinery.

ALLEGED NEGLIGENCE IN HOUSE DRAINAGE OPERATIONS.—EMERY V. CAFE.—At the Brighton

County-court on Friday, Arthur Emery, of Lansdowne-street, Hove, builder, sued Mrs. F. Cafe, wife of Major Cafe, for £40 17s., balance of account for work done at 93, Lansdowne-place, Hove. Defendant had entered a counter-claim amounting to £15 4s. for damages alleged to have been sustained by the negligence of plaintiff in the execution of the work, and paid into Court the difference between the claim and the counter-claim. The work for which he claimed was carried out according to the estimate, under witness's superintendence. The work included the taking up of an old drain and the laying down of a new one, which he did to the satisfaction of the sanitary authorities. He noticed cracks in the partition wall, but they were not caused by the work witness did. Two men in the employ of the plaintiff said that the work was properly done, and that they put in plenty of timber support for the wall. Henry Brownrigg, sanitary inspector to the Hove Commissioners, stated that the excavation was properly timbered. The work was done properly, and he passed it. Mr. Boxall, for the defendant, submitted that the work was negligently done, and by digging under the party-wall the workmen caused a settlement. Mr. Charles Nye, architect, said he found that there had been a settlement, attributable to the excavation of the ground. There would not have been a settlement if the work had not been negligently done. Mr. A. Loader, architect, said the settlement was, in his opinion, caused by want of shoring and strutting in the trench. Witness considered the amount of the counter-claim very reasonable. His Honour gave judgment for the defendant, with costs.

WATER SUPPLY AND SANITARY MATTERS.

CLECKHEATON.—After negotiating for six years, the Cleckheaton local board have just effected an agreement with the Liversedge local board for the reception and purification of the Cleckheaton sewage at the Liversedge outfall works. The original annual payment claimed by Liversedge was £700, and their latest offer of £450 has been agreed upon. Liversedge will make a sewer at Moorbottom, and Cleckheaton will simply have to connect with the Liversedge drains and pay the annual sum of £450.

CONGRESS OF HYGIENE AT DUBLIN.—Under the auspices of the British Institute of Public Health a Congress of Hygiene was held on the 17th inst. at the Royal College of Surgeons of Ireland on St. Stephen's Green, Dublin. Sir Charles Cameron, President of the Institute, who occupied the chair, claimed for Dublin Corporation that there were few municipalities in the United Kingdom that had done better work or acted more liberally in carrying out sanitary reform, and expending money for that purpose during the last twenty years. During the last four alone they had expended a sum of a quarter of a million of money obtained on sanitary loans from the Treasury. The city was not naturally placed in a good sanitary position, and it was for the skill of the sanitary engineer to some extent to remedy this state of things. He believed that the death rate from typhoid in the city, in spite of the excellent water supply, was due to the sewage-saturated character of the soil. Papers on various infectious diseases and their origin were read by medical men, and the proceedings concluded with a dinner at the Spa Hotel, Lucan.

A new church is about to be built at Abergwynfi, diocese of Llandaff, to seat 500, from the designs of Messrs. Halliday and Anderson, architects, of Llandaff and Cardiff.

In the case of Frederick William Serff, late of Chiswick High-road, and Fulham Palace-road, Hammersmith, present residence unknown, builder, the discharge has been suspended for two years ending July 19, 1894.

The church of St. Donat's, diocese of Llandaff, is about to undergo careful reparation at an estimated cost of £1,000. The work will include repairing and reslating the roof of the chancel and Strading Chapel, now much decayed, and rendering the walls watertight. No structural alterations will be made to the building. It will be remembered that the St. Donat's 14th-century churchyard cross is said to be the most perfect in the United Kingdom. The work will be carried out under the superintendence of Messrs. Halliday and Anderson, architects, of Cardiff and Llandaff.

An inquest was held at Bromley, Kent, on Friday, on a carpenter named William Manwaring, in the employ of Mr. Soper, a Lewisham builder, who died in the Cottage Hospital from internal injuries, apparently received by the fall of a heavy sash while putting cords in the boxes. Evidence was given showing that deceased could easily have had more assistance had he asked for it, and a post mortem examination revealed the existence of an ulcer in the stomach, which accelerated death. The jury returned a verdict accordingly.

Our Office Table.

AN International Congress of Architects will be held at Chicago next summer, in connection with the Columbian Exhibition. Following on the lines of the Architects' Congress held at Paris in 1889, an advisory committee is to be selected from among the representative architects of all countries, including especially the presidents of professional societies. Mr. H. D. Burnham, of Chicago, is the chairman of the provisional committee for the forthcoming congress; and Mr. Robert C. McLean, of Room 19, Tribune Buildings, Chicago, is Secretary to the committee of arrangements, and to him all communications should be addressed. Among the subjects for discussion it may be expected that architectural education, examination, and registration will hold a prominent place.

THE lean exhibition at Birmingham Art Galleries this autumn will consist of works by living English animal painters. Mr. Whitworth Wallis, the energetic secretary of the gallery, has obtained fourteen of the principal works by Mr. Briton Riviere, R.A., seven or eight by Mr. H. W. B. Davis, R.A., and pictures by Messrs. J. T. Nettleship, John Charlton, A. C. Gow, R.A., S. E. Waller, J. C. Dollman, Burton Barber, Heywood Hardy, R. Beavis, J. S. Noble, R. Caton Woodville, Sidney Cooper, R.A., Basil Bradley, E. Douglas, Walter Hunt, R. Meyerheim, A. W. Strutt, and others, each artist being represented by four or five works. Mr. J. M. Swan will be represented by a series of studies, together with some of his bronzes. The exhibition, which will open in October, promises to equal in interest the David Cox Exhibition held in the same galleries in 1890, and the Pre-Raphaelite collection shown last year.

THE arrangements for the third annual congress of the National Registration of Plumbers, which is to be held in Dundee on 7th and 8th September, are now well forward. The Inverness District Committee will be represented by Provost Ross, Inverness; John A. Mackenzie, burgh surveyor, Inverness; Robert Black, C.E., Inverness; W. C. Joass, architect, Dingwall; Alexander D. Fraser, R.P., Inverness; Roderick Mackenzie, R.P., Dingwall; Daniel Walker, R.P., Inverness; A. J. Russell, R.P., Inverness; and Robert Reid, R.P., Dingwall. Friday, the 9th, will be devoted to pleasure. In the forenoon the strangers will visit the Technical Institute, and it has been arranged that in the afternoon they will leave Dundee on board the steamer *Forfarshire* for Perth, which place will be reached about four o'clock. The delegates will be received in the Town Hall by the Lord Provost and Magistrates, and thereafter will be entertained to tea by the Lord Provost in one of the hotels of the city. In the evening they will return to Dundee.

MR. W. H. M. ELLIS complains of the alterations which have recently been carried out in the parish church of Wiggenhall St. Mary, Norfolk, as he asserts, without a faculty being obtained. The church was, he reminds us, famous for its wood-work; the grand bench-ends in the nave still remain, but the chancel stalls have been carried away by the lay impropiator Mr. Bagge to Gaywood, and the famous screen, dated 1625, has also gone. All that remains in the chancel is the lower panels of the Mediaeval screen, which the present vicar saved. The famous sixteenth century lectern has also been moved. Some of the nave benches, of which there happily remain about thirty, nearly all different, and the rich south aisle screen, were illustrated in the *BUILDING NEWS* for Aug. 16 and 23, 1889, from measured drawings and sketches by Mr. E. Guy Dawber.

THE Merthyr School Board discussed at great length, on Friday last, a motion, stating, "That if tenders are advertised to be in the clerk's hands by a fixed date, no one connected with the Board is authorised to extend that time to any applicant, whether the meeting takes place at once or at any future date." It was admitted by members that the clerk had taken a tender after the specified time had elapsed, but before the other tenders were opened, and by this conduct it was contended that £150 of the ratepayers' money was saved. The clerk, it was explained, laid the matter before the Board before the tenders were gone into, and the Board agreed with what he

had done. It now transpired that the unsuccessful contractor had sent each of the members of the Board a letter calling attention to the circumstances of the case. Eventually the clerk was exonerated from all blame, but the motion was carried with only one dissident.

WE have seen a few very artistically executed specimens of parquetry at Messrs. C. Steinitz and Co.'s well-known London Parquetry Works, Camberwell Hall, S.E., where only hand labour is employed. One was for the floor of a bay window, from a design by Prof. Aitchison, R.A. The design of filling takes the form of a natural treatment of foliage, the stems and foliage being symmetrically disposed from a centre line or axis. Some very effective borders for floors are also on view, the inlaid woods being walnut in satin wood or sycamore. We also noticed a hall table in oak and butternut, of pleasing design; another of purple and olive wood. The centre parquetry panel on the floor of the South London Fine Art Gallery, executed by this firm, is a very bold and remarkable piece of work, the design of which was prepared by Mr. Walter Crane, and was illustrated by us April 24th, 1891. As a design this centre, 30ft. by 9ft., is bold and aquatic in character. The plant forms combined with shells are vigorously conventionalised, and the border of leaves and fish is very clever. The ground is of teak, and the pattern is executed or inlaid with shades of brown woods relieved by wainscot sycamore, canary satin and black woods. This fine design in parquetry was presented by Messrs. Chas. Steinitz and Co. to the gallery.

A BIG case turning on the validity of engineers' verbal orders is attracting attention among American contractors. Messrs. O'Brien and Clark, the contractors for section 6 of the new aqueduct which supplies the city of New York, recently sued the city for about 800,000dols. for extra work. The extra work, which was admittedly executed, seems to have been mainly done upon the verbal order of the engineer in charge. The Court in which the case was first tried gave judgment for the contractors for 20,000dols. The representatives of the city conceded that this amount was due, and stood ready to pay it, so that the decision was really a rejection of the contractors' claim. The contractors appealed, and the General Term has unanimously affirmed that of the Court below on the ground that the contract gave no authority to the engineer to order work in excess of the plans and specifications; as the President Judge Van Brunt put it, no liability to the city could ensue out of mere talk. It is still open to the contractors to carry their case to the Court of Appeal, but the ruling is so decided that it is doubtful whether the contest will be continued further, although it is understood that contractors for other sections of the aqueduct have similar claims, amounting in the aggregate to millions of dollars, the fate of which will be governed by this decision.

THE seventeenth annual report of the Public Works Loan Board states that the Commissioners, during the financial year 1891-92, made 494 advances for sums amounting together to £960,159, as against 481 advances for £990,068 in the previous year, showing an increase of 13 in the number of advances and a decrease of £29,909 in the amount advanced, as compared with 1890-91. Of this sum £9,000 was for providing dwellings for the working classes; £21,050 was for the purposes of the Harbours Act, 1861; £371,074 was lent to local authorities for sanitary purposes in England and Wales; and £26,128 for sanitary purposes in Scotland; £406,384 was lent to school boards in England and Wales; £115,123 to school boards in Scotland; and £9,000 for workhouses in England and Wales.

AN unexpected obstacle has arisen to bar, for a time at least, the carrying out of the municipal buildings scheme at Bath, for which Mr. J. M. Brydon's plans were, it will be remembered, recently selected in competition. In order to provide the necessary space for the extension, the closing up of an almost useless roadway called Boatstall-lane, with two approaches, one at the corner of the Market-place and the other from the Orange-grove, is needed. The city surveyor accordingly applied to two city justices for a certificate for the closing of the lane on the ground that it would be "more commodious to the public." The magistrates felt, however, that they could not give the certificate on these

grounds, as the substitution of one new road for two existing roads could not be termed "more commodious." When this became known to the public it caused much irritation, especially to those who had spent much time and trouble in furthering the progress of the scheme. On Saturday the magistrates reconsidered the question, and a *modus vivendi* was arranged, though it will require two applications, instead of one, to the court of quarter session. The justices agreed to give a certificate at once for the closing of the approach from High-street, and said that favourable consideration will be given to an application later on for a similar certificate in respect of the approach from Orange-grove. Fortunately this will not interfere with the progress of the preliminaries in the form of detailed plans and obtaining tenders.

THE sanitary committee of the Bradford Corporation have recently doubted the expediency of continuing to sanction plans for the extension of the present system of privies in that town. After correspondence with the officials of other large towns, the Corporation, on the recommendation of the committee, have issued a circular to architects and builders stating that they have determined to require in future that water-closets shall be provided for all new buildings, except where no suitable sewer is available for the drainage thereof, as they are now of opinion that privies, under the most favourable circumstances, are objectionable on sanitary grounds, in addition to the difficulty of disposing of the contents of privies without causing complaints of nuisance or inconvenience. Except where impracticable, it is enjoined that water-closets shall be provided in place of privies in all new plans submitted for approval. This is a step in the right direction.

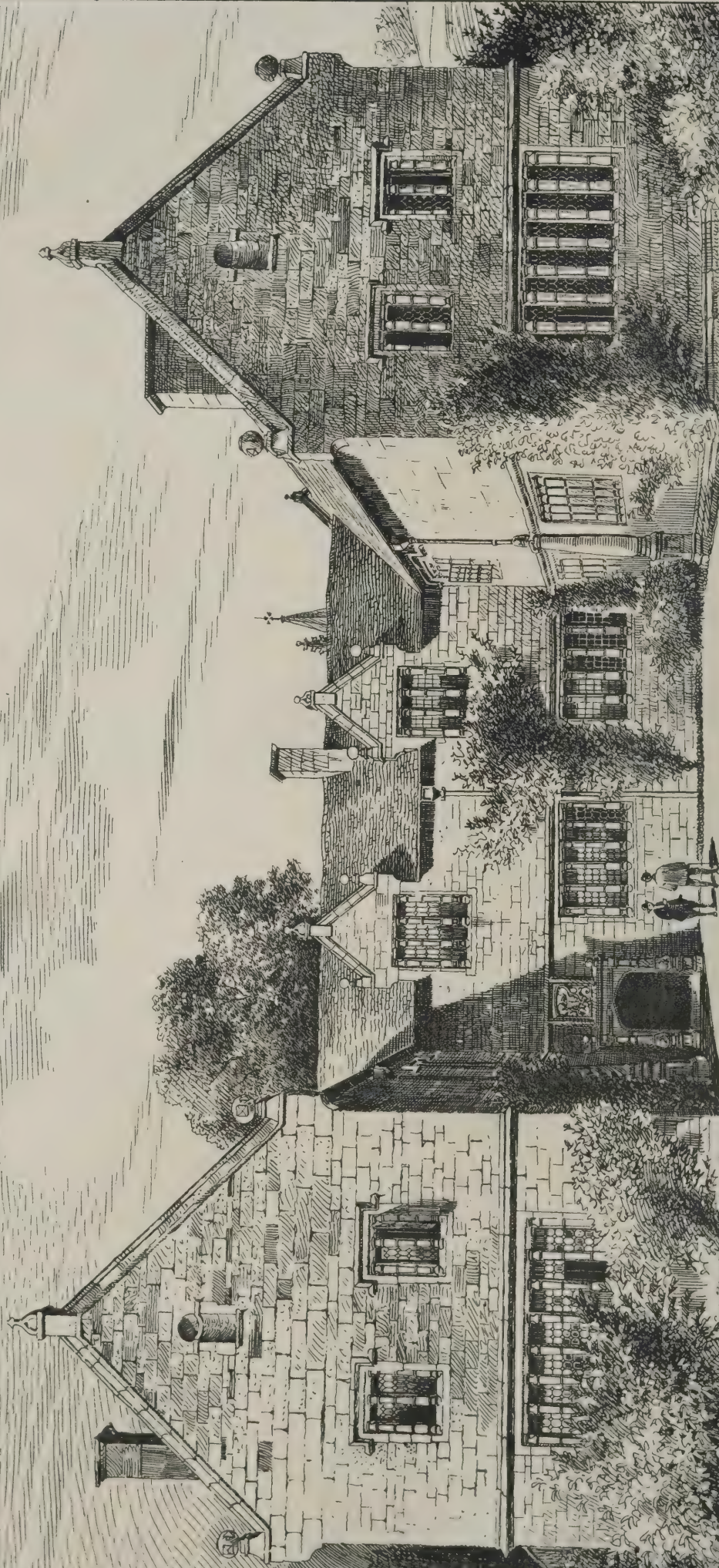
AMONGST the new building materials which have found a place on the Continent is Xylolith, a German concrete compounded of sawdust and other materials not mentioned. It is supplied in plates or tiles of any size up to one square metre in area, and has the qualities of wood, but does not shrink. As a covering for treads and landings and floors, it is said to be valuable, being lighter than stone, not slippery, and wearing well. The steps resist abrasion better than those of oak. For hospital floors xylolith has been found of value as being non-conductive and impervious; the joints are few, and do not open, and therefore desirable where a sanitary surface is desired. The slabs have also been used for wall surfaces set in an iron framework, and are fire resisting. In Berlin it is used for the lining of theatres, and for decoration.

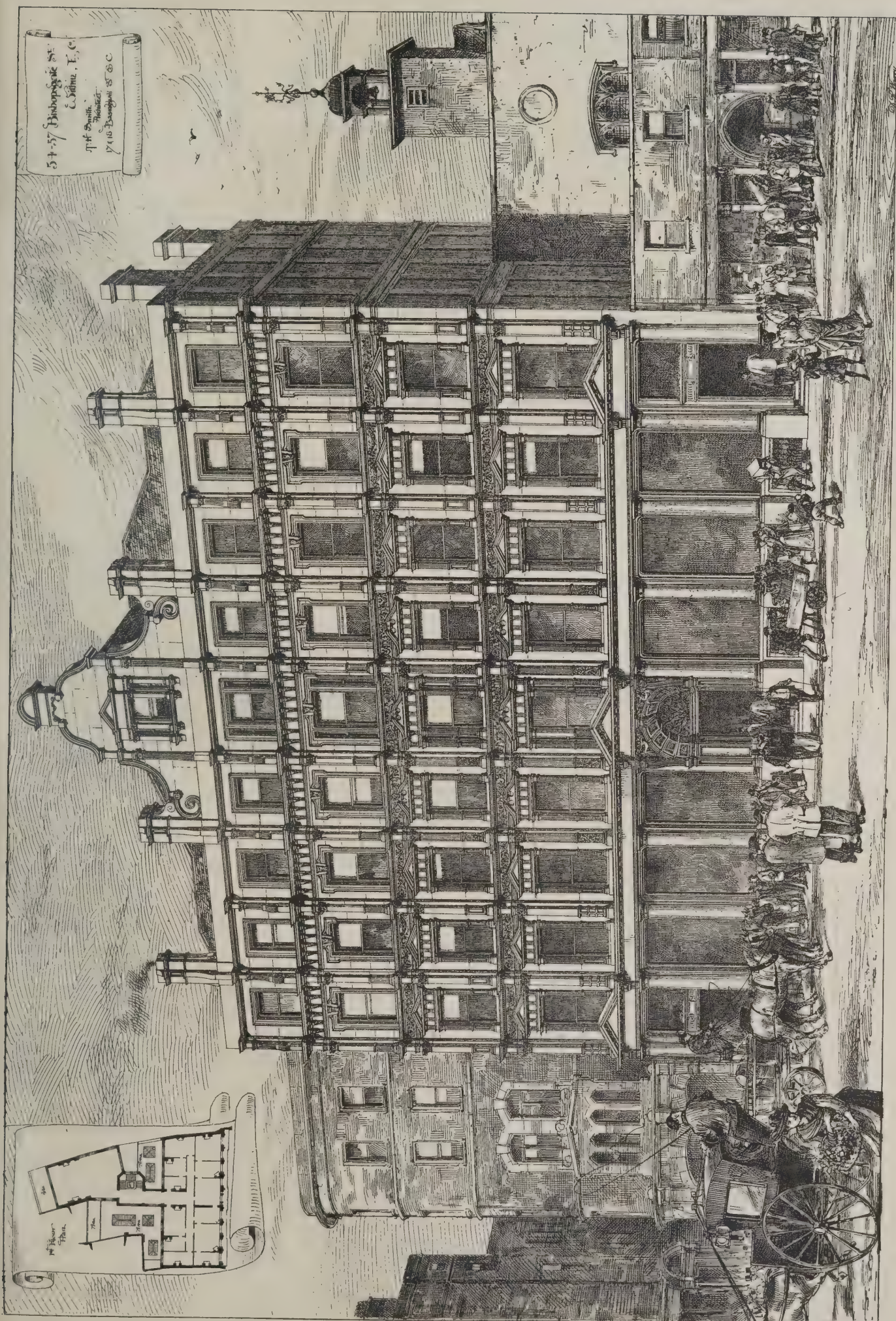
THE Administration Report for 1891-2 on the Railways in India shows continued progress, but not at the same rapid rate as in the previous year. During the twelvemonth, 65½ miles of new railway on the standard gauge were opened, and no less than 612½ miles on the metre gauge, making a total of 677½ miles, there being now 17,564 miles of railway open in India, as against 20,073 in the United Kingdom with an area of one-thirtieth. In 1890-1, 874½ miles were opened, of which nearly 58 per cent. was of the standard and 42 per cent. of the metre gauge, a dozen miles being of various irregular gauges. The differences of the gauges will probably be found to be an expensive item in railway management in the future, and it is to be regretted that two widths have been so largely adopted. At present there are 10,104 miles of standard gauge, 7,172 metre gauge, and 288 of special gauges. During the year sanction was given to the construction of 1,697 miles of additional lines, by far the heaviest undertaking being the Assam and Bengal Railway, 742½ miles in length.

AN interesting feature of the Arts and Industries Exhibition, to be opened on the 24th September at Barcelona, will be an international section of reproductions from the artistic industries of all ages prior to 1815. The rules provide that only one copy will be admitted of each reproduction except in the case of casts, of which two may be exhibited. Each reproduction must state the place where the original is to be seen, and any deviation from a strict imitation of the original must be clearly notified. The works will be judged by the jury of the general exhibition, and medals and certificates are promised. All works intended for this section must be delivered at the offices of the Secretary of the Exhibition, Paseo de Pujades, Barcelona, before the 1st proximo.

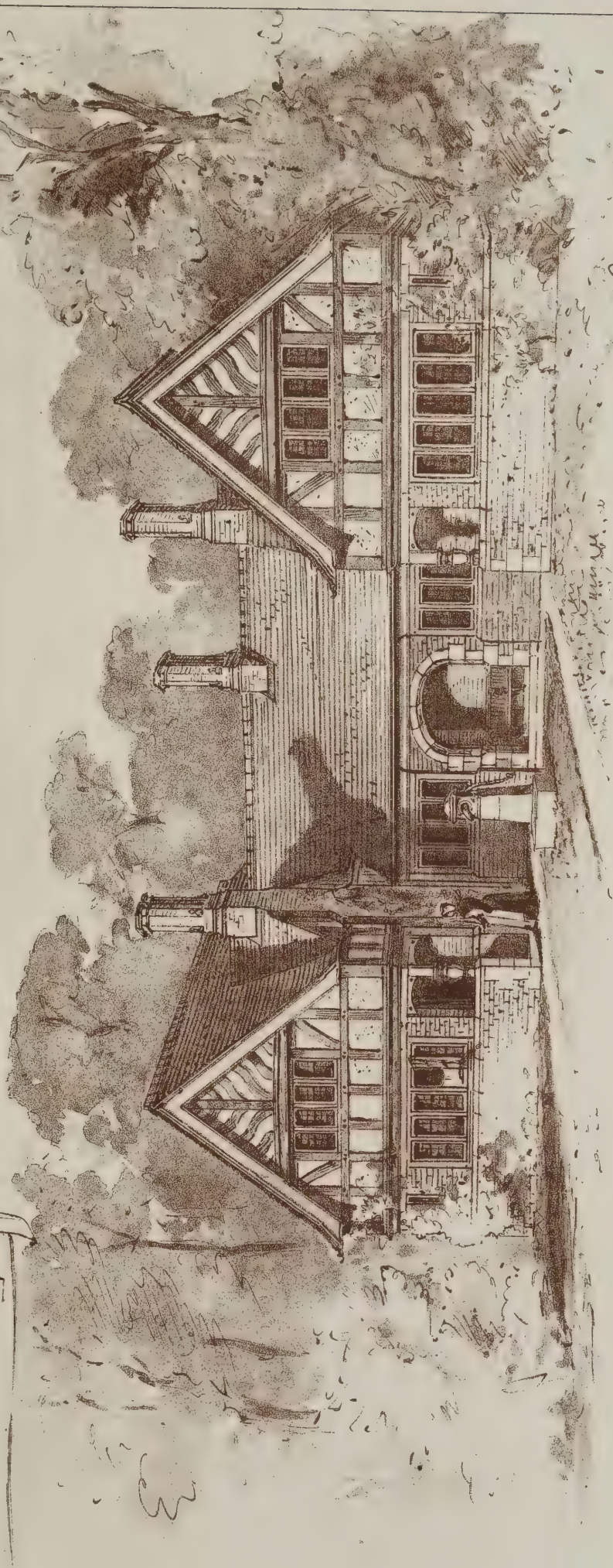
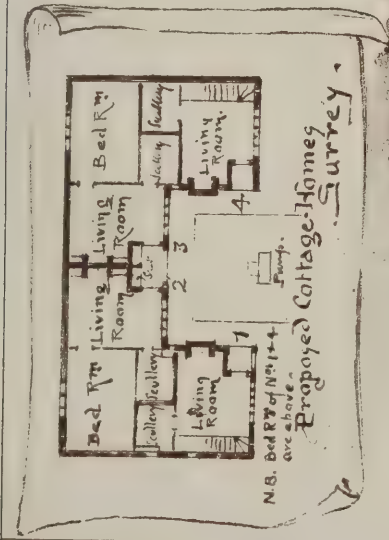
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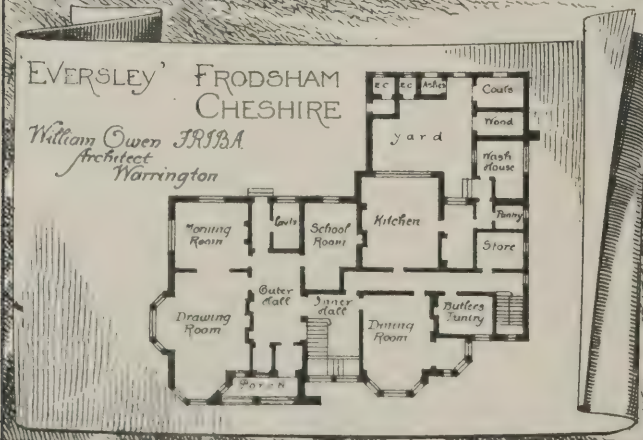


Plates Lithographed & Printed by James Akerman, 6 Queen's Square, W.C.



Early Victorian, London
Oct. 1891.

"PHOTO-TINT" by James Akerman, 6, Queen Square, London, W.C.



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FRIDAY, SEPTEMBER 2, 1892.

THE ARCHITECTURE OF ANGLES.

IN hardly any other position is architecture so expressive as it is at the angle of a building. The massive tower rising majestically at the angle of a large edifice—like the Victoria Tower does at Westminster—or the western towers of some fine cathedral—like those of Canterbury or Lincoln—appear in the mind's eye to gather up and concentrate all the power and expression of the building to emphasise the design. The central tower and dome may, indeed, be more powerful in captivating our imagination and awakening in us sentiments of pleasure, of mirthfulness, or of awe, according to their size and outline; but next to this position of dominating importance, the corner claims attention, and the corner is the position which the architect from time immemorial has generally chosen to display his skill and to concentrate attention. The angles of buildings are accentuated by projections, pavilion roofs, or towers—even by the carved angle-posts of old houses; the angles of a tower have their buttresses, pinnacles, or corbelled turrets, and this desire to mark the angle is particularly noticed in the castellated and domestic edifices of Scotland, where the small circular turret, with its conical-shaped termination, is almost invariably met with, and the form given to this feature varies from the simple angle-post to the richly-designed structures which adorn the chief corners of many of the hotels de ville of France, Belgium, and Germany.

The same significance is apparent if we transfer our remarks from the angle of a building to the corner of streets. In this position the angle has played a very important part in the architecture. Let us imagine a number of streets intersecting each other at angles without any attempt to mark the corners, numerous instances of which occur in London. Can anything be more meagre or unsightly? In cities like New York, Chicago, Brooklyn, where the rectangular system prevails, the monotony of the arrangement would be painfully felt, and the architects of those cities have wisely attempted to mitigate the abruptness of the angles by various means more or less satisfactory. The corner tower is a prevalent feature. In our own Metropolis, the junction of streets, especially when they converge as they do at Oxford-circus, at the junction of Tottenham Court-road and Oxford-street, at Cambridge-circus, and other busy centres of traffic, is becoming one of the problems for architects. Street alteration and extension have increased the number of awkward junctions, much to the bewilderment of visitors and strangers. As great centres of traffic, they ought at least to possess architectural emphasis. On the contrary, they are often hapless arrangements of intersected blocks cut into segments by the converging streets, squalid and undignified. The London County Council may relieve the supreme ugliness of these centres by doing something to prevent haphazard jumbles. Sometimes an elongated ellipse or octagon, or even an irregular polygon, may be more appropriate than the circular form of these circuses, as allowing the existing frontages or the new buildings at the corners to be set out with more architectural propriety. The corner buildings ought to be the main consideration in deciding upon the form of circus. What architectural treatment is possible in a building of the shape of a truncated wedge on plan, the truncated por-

tion being that facing the circus? It is this form of corner that is so difficult to manage, especially when sides and angles are alike unequal. The roofing presents considerable awkwardness. Take for example the recently constructed Cambridge-circus in Charing Cross-road. Here seven streets meet and intersect, forming unequal segments. The buildings are ambitious, but exceedingly awkward. Here was a splendid opportunity of forming a new circus worthy of the Metropolis; but, as generally happens, it has been lost. Commonplace buildings are erected round half the site, chiefly because no effort was made to arrange the intersecting lines. The New Opera House, with its flanking angle turrets, made a good beginning, and it may be asked why the other segments could not have been designed in some harmony with this structure. Between Charing Cross-road and West-street, a lofty block, known as Gloucester Mansions, has been erected, six stories in height, and occupied as shops, sitting, and bedrooms. As a design it is a fair specimen of what may be called the "Investment-in-Commercial-Premises style," an ambitious front with dormers and pavilion roofs, in which all the effort has been expended in the front elevation towards the Circus. There are three or four such blocks of buildings erected the corners of which have turrets and oriels. The block of shops, sitting, and bedrooms appears to be the class of building which "takes" in these centres; but here was a good opportunity presented for the erection of public edifices, suites of offices, and the like. Even in so irregular a junction of streets some attempt to connect the elevations of the main corners would have been more satisfactory if the corner angle turrets, corbelled out and crowned by small cupolas of the Opera House and the octagonal corner of the City Bank, had been repeated at the opposite side of the circus. In these positions the corner plays a great part: it really forms the termination between two converging streets. A little further northwards is seen another red brick block of flats, the Halberstadt Mansions, with a huge stepped and scrolled gable towards the street relieved by octagon-shaped engaged pinnacles corbelled out. The corner is canted, and in the gable there are six stories above the shop. The style is Flemish Renaissance, and the building agreeably breaks the monotony of the long street. The "Trentishoe" Mansions have the corner turned as an octagonal turret, finished with a conical roof and lantern. Near the Oxford-street end is another large red brick and stone block of offices nearly completed, the angles of which have simply three-quarter circular turrets corbelled out of the canted sides. Again, at the junction of this road and Cranburn-street a corner turret oriel of stone is made to spring from a column.

Another instance of what has been lost in the picturesqueness of our new streets is the junction of Endell-street and Shaftesbury-avenue. The awkward joining of the Avenue with Broad-street is very unfortunate. A red-brick and stone row of gabled mansions have been built on the north side of Broad-street, and a little further northwards in the Avenue is a block of offices and chambers, which forms an acute angle with Dyott-street. This angle has a circular oriel, finished below the main story and capped by a roof, but kept so low that it does not emphasise the angle. Here was a good opportunity of making a feature of two new corner blocks where the street was wide and the view from Endell-street uninterrupted. A corner building may become a prominent protruding feature in a long line of street, as that which bifurcates Oxford-street and Hart-street, where a tower-like composition is called for.

The mode of treating the corner may be discussed, and would form an interesting subject if we dealt with the many varieties

that meet us in Continental cities, in this country, and in America. The circular and the canted forms are positively ugly and commonplace, as the builder is apt to give them to us, in the ordinary type of public-house rounded corner, with its doorway illustrating the problem of a circle on circle, and its everlasting brewers' sign over, and it is extraordinary that for many years this hideous and intractable form has continued. In France and Germany the projecting circular corner, as we find in the Chateau de Chambord, and many other examples of domestic architecture, the square pavilions, as we see at the angles of the Louvre, are features separately roofed from the main structure, imparting a piquancy or grandeur to the mass. The old French and German and Flemish cities are rich in their variety of angle architecture. At Rouen, Lisieux, Freiburg, Hildesheim, Frankfurt, and other places we find the angle oriel or turret of one or several stories projecting from the corners of buildings. At Wurzburg the well known Bishop's House affords a notable example of the ornamental angle turret, and at Boppard and other towns on the Rhine the same may be seen. The pencil of Mr. Callow has made us familiar with many instances of this picturesque addition to German Renaissance buildings. The conical roof nearly always crowns the corner oriel. In London the architect is compelled to restrict his projections even at the corner, and so when he designs a feature of this kind he has to keep it within the lines of his main front, except when it springs above the lower story. Mr. Waterhouse's angle tower to the National Liberal Club House in Northumberland-avenue, is a good modern instance of how an acute corner may be treated. For ordinary buildings, the canted corner may have a circular or polygonal-shaped oriel corbelled out above the first floor, and such a treatment may be seen in many of the new buildings in the West End. The corbelled window jutting out from a canted corner may be noticed in Mr. Belcher's new Institute of Chartered Accountants in Broad-street, and in other recent buildings. But in the larger number of buildings the corner cant is narrow, and the feature is dwindled in size. At the corner of main streets we need a bolder splay or a larger circular corner. The small turret carried up as a cupola or otherwise, such as we see in Oxford-street, and in some places in the City, is paltry, and can only suggest ridiculous comparisons. Whether as angles architecturally treated in this manner, or as whole buildings, the corner deserves more study in the reconstruction of our streets, squares, and circuses. What the picturesque corner combinations might have done to improve such centres of traffic as Piccadilly-circus, Oxford-circus, Ludgate-circus, Charing Cross, can only be realised by the artistic mind. The bold quadrant, accentuated by massive pavilions or towers, is a composition scarcely known in London; and until we adopt a more liberal scale in the planning of our thoroughfares and centres, our attempts in this direction will be puerile, or will be mainly dependent on private enterprise.

THE SANITARY CONDITION OF OUR TOWNS.

WHEN so unwelcome a visitor as cholera is near our doors, it is time to set our houses "in order," at least so far as to inquire into their sanitary condition. Even the "scare" of some pestilential epidemic is at any rate beneficial in awaking us out of our dream of security. So radical and important have been the changes in the condition of the Metropolis and our larger towns since the last visitation, that it may be thought we are full abreast of our foe, but

it appears from recent reports made by the *Lancet* Commission, that our supposed immunity is not so well assured as we imagined, that our houses are not so impregnable to attacks as we thought they were. The *Lancet* Commission points out what are the essential conditions which should be fulfilled before the drainage of any house can be passed as satisfactory. These are briefly that, as far as possible, drainage should be outside the house. The soil-pipe should pass directly from the closet-trap through the wall and down the outside of the house to the drain; the latter should be of glazed stoneware or iron pipes, 6in. diameter; where they pass underneath the house they should be encased in concrete, the fall not less than 1 in 50ft.; that between the house and sewer there should be a manhole or disconnecting chamber, with channel pipes from all the closets and wastes; that the drain should be ventilated; that rain-water pipes should be disconnected, and discharge into open gullies, &c. These are the main essentials, with which our readers are already conversant. That the condition of a very large percentage of the houses in the country is by no means up to this standard cannot be disputed.

The report, at any rate, makes it very clear that landlords, those who own and let houses, are often totally indifferent to the subject of drainage; many of them from simple ignorance, others from commercial motives. The general public are equally indifferent or ignorant. The process of inquiry adopted was most thorough, as it was intended to go to the root of the matter. To 1,000 house agents and surveyors who let houses in different parts of the country, the appeal for information has been made, and the answers received have undoubtedly established the fact that the public have under the present system of letting and taking houses no security whatever. The tenant signs the lease or agreement of a house without knowing really the actual condition of the drainage or water supply; he makes no inquiry as to the drains, whether they leak or are faulty, whether they are cut off from the sewer or ventilated, or how they are jointed. The tenant, as a rule, has to do with the agent in the first instance, and the agent is instructed by his employer, who, of course, is not willing to disclose, even if he knew anything in the sanitary condition of the premises was wrong, any fault to the tenant. Is it at all likely? And is it much more likely that the agent, who is anxious to obtain his commission for letting the property, should *desire* to know, or wish to disclose, anything detrimental to the letting of the said property? House agents can scarcely be regarded as independent agents in many cases, so that the information that has been gathered is certainly of the most disinterested kind. The Commission reports that the prevailing opinion amongst their correspondents is very decidedly that "the amount of information placed at their (the agents') disposal by landlords for the benefit of proposing tenants is quite insufficient to enable them to give an accurate and trustworthy opinion of the houses they are asked to let or sell." Precisely so. Some of the agents regard the silence of the landlords as due to ignorance, and not to the wilful suppression of defects. Very possible; but do the agents ask for special details as to drainage? Is it their duty or business to do so? Certainly not. One or two are honest enough to describe the consequence of such inquiry. Supposing a house-agent did inquire, is it likely the landlord would give information as to any defects? We opine not. Are we to suppose that landlords are more trustworthy than some other vendors of property? Of course, there are landlords of high character who would scorn to place their own pockets before their responsibilities, but we are afraid to say how many. Happily, the

local sanitary authorities discover the defects for themselves, and protect those who are too ignorant or indifferent. In such towns as Eastbourne, Brighton, and Hastings houses are inspected, and those not above suspicion are soon condemned, rendering it almost impossible for a landlord to derive any advantage from ignoring defects.

Various suggestions have been made to meet the evil, such as that there should be a plan of the drainage in every house to be let, that a builder's certificate should be produced, that local authority should make periodical inspections of all houses and grant certificates with date of last inspection, that the authority should advise what alterations should be carried out, that the authority should preserve the "sanitary history" of every house, that the tenant should have an inspection of the drains made, the fee to be paid by the tenant. Many of these have been made before.

We are strongly of opinion that the local authority should obtain the information and grant certificates of good drainage, and should, in fact, take the sanitary efficiency of every dwelling in their own hands, the only way of doing which would be to make periodical inspections and records of every house when vacated. These inspections, if but optional on payment of a fee, would only benefit the few that wished them. Of one thing we are sure, reform will not come, and it never has come, from the interested party—the landlord or vendor. Nor has our knowledge of transactions with house agents given us much hope that amendment may be looked for from this quarter, as the house agent is bound to serve his client, and, therefore, it seems absurd to expect that the agent will furnish the inquiring tenant with a full and trustworthy account of such a matter as drainage, or be the right person to make a professional report for him. Many are the reasons which are given for objecting to the agent acting as a surveyor for the client. Amendment must come from those about to take the house. The tenant must either be educated in the essentials of a sanitary house or be protected by law. The Sanitary Registration of Buildings Act, introduced during the late Parliament, was a movement in the right direction, but vested interests are too strong to enable a measure of the kind to be carried. That a local authority should inspect every dwelling-house when vacated, and see to its being put in sanitary order, is the only means left of preventing the letting of insanitary houses to unwary tenants, and the plan adopted at Eastbourne, by which the local authority grants a certificate to a landlord if his house is equal to the standard of requirements, is one that commends itself. The plan of registration by this means is a good one, and if it is a voluntary act on the part of the landlord, no one can find fault, and the certificated houses so registered are sure of being let. Certificates granted by those interested in the house, whether as builders, agents and landlords, or even as sanitary experts, are open to suspicion. Compulsory registration ought to be undertaken for all seaside hotels, boarding-houses, and lodging-houses, as we have before suggested, and we think that clauses of the Housing of the Working Classes Act may be usefully applied to all houses in our towns.

THEATRES.—VI.

By ERNEST A. E. WOODROW, A.R.I.B.A.

MOST writers on the subject of theatres dwell fully upon the excellence of the Greek and Roman amphitheatre. The conditions, however, under which these buildings were erected were so widely different to those of the modern English theatre, that beyond the interesting study of the subject there is little to be

gathered from the form of these buildings that will be of service to the student of theatre planning of the present day. "It has been asked," says Saunders, "why have we not in our theatres made choice of the same form as the ancients? And the answer has uniformly been, because our manners differ from the ancients, because in adopting the semicircle we should be obliged to leave too great an opening for the stage. Allowing these objections their due weight, we may add that theatres had their rise in Greece, and from Greece the Romans no doubt took the model for their own country; their climate required a spacious open area, as the performances were conducted during the heat of the day before a people unaccustomed to any inclosure that shut out the open air. . . ."

I touched briefly in the last article upon the acoustics of a theatre; the sighting of the auditorium is so closely associated with this, that it would have been well, had space permitted, to have dealt with the two subjects under the same chapter. It may be taken as a broad axiom that where the spectator can conveniently see all the facial expressions of the actor, he will hear with ease the words spoken or sung by the actor; where a member of the audience has to twist his body round and crane his neck to obtain a view of the performer, he will experience a difficulty in following the action of the play, as well as suffer acute physical fatigue.

"The phenomena of light and vision," says Professor Roger Smith, "closely resemble those of sound and hearing, and the two mutually illustrate one another." Where there is an obstruction to sight there will be obstruction to sound, though not always to the same extent. "In every building intended for public purposes, provision should be made that each person shall receive a direct and uninterrupted ray of sound, and shall have an equally uninterrupted sight of the speaker."

I may appear to dwell upon this truism at too great a length; but how many visitors to our theatres have experienced the annoyance of paying for a seat, from which a view of the performance could only be obtained by bodily inconvenience? Many, I fear. I have heard it related of one manager who refused to allow his box-office keeper to sell certain side seats in a provincial theatre, he looking upon it as robbery of the public, to let them seats from which they could neither see nor hear.

I have been impressed with the remarks Mr. Buckle makes on this subject in his work, to which I have already referred more than once. "To the professional reader," he says, "it will appear a reflection on his intelligence to suggest that in buildings intended for the reception of the public the lines of the interior should be so designed that each person may receive a direct and uninterrupted ray of sound, and an uninterrupted sight of the speakers. For the lay reader who visits a theatre—designed on the most approved principles—to find that there are seats from which only two-thirds of the stage can be seen, the other third being cut off by a vertical line formed by the private boxes, the possible perfection of sighting will awaken a sense of prospective pleasure. This is both possible and practicable, and its acquisition merely demands a careful adjustment of the 'lines' of the interior and the solution of minor constructive problems."

Since these words were written, but a few years ago, several new theatres have been built in London, and it is a matter of congratulation to the profession that, at any rate in the modern London playhouses, this evil is becoming conspicuous by its absence. "Past failures," the same writer continues, "in respect to sighting are largely attributable to the designers having failed to realise that the conditions contributing to perfection of sighting in a church or lecture-hall, where the speakers are stationary, are not compatible with the exigencies in a theatre, where the speakers are continually changing their positions. In the former case the sighting is to one single point, while in the latter it must be equally good to a series of points extending along a line parallel with the spectator, and some 20ft. or 30ft. long, according to the width of the proscenium opening." In a former chapter (No. IV.), it will be remembered, I explained how the width of the proscenium opening governed the whole design of the plan of the theatre.

The method of setting up a section of a theatre so as to obtain a perfect view of the stage for each spectator has been described by many

writers, and is so clearly put forth by some of them, that I cannot do better than refer my readers to the works of Professor Roger Smith, Mr. Tarver, and Mr. Buckle for further study of the subject. Scott Russell, in an article which appeared in the *Edinburgh New Philosophical Journal* for 1839, published a description of the mode of setting out the seating for a large public building, such as a lecture theatre. Later M. Lachéz very fully developed the same method, adapting it to the theatre for the drama in his work, "Acoustique et Optique." The position and height of the speaker on the platform, and of the auditors occupying the first seat being determined, a line is to be drawn from the speaker's mouth, touching the point where the top of the first auditor's head would come, and at the proper distance—say, for example, at 2ft. 6in. back—the situation for the second auditor is to be marked, and on the line indicating the back of it a height of 1ft. 6in. or less is to be set off upwards from the point where the ray from the speaker's mouth touched; this is to mark the position of the top of the head of the second auditor.

By repeating this process, setting up 18 in. at each seat, a series of points are found all ranged in a curve, which is called the "isaccoustic" curve, or equally hearing curve. Each seat will be placed about 2ft. 9 in. below the mark indicating the top of the head of its occupant, and the floor on which each stands should be about 1ft. 6 in. still lower. This description, with the accompanying diagram, borrowed from Mr. Smith's work, explains the principle of the

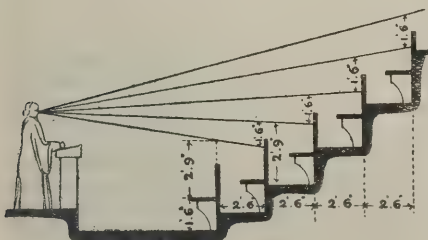


FIG. 1.

isaoustic curve as adapted to any hall, lecture theatre, or public building.

Speaking specially of theatres, it has been said that as a theatre is, as the word implies, a building to see in, the first consideration is that every one shall see the actors comfortably over the heads of those in front of him. "It will be sufficient," writes Mr. Tarver, "if every one can see over the head of the person in front of him the knee of an actor 10ft. back from the front of the stage; he will then see his feet over the shoulders of those in front of him. I have tested this," the same writer continues, "in various parts of London theatres, and found it quite a sufficient line of sight."

The seats should be arranged so as not to be immediately one behind the other, but placed to allow the occupants to look over the shoulders, and not over the heads of those in the row immediately in front. There is no difficulty in making this arrangement in the circles where the gangways and seats radiate, and the number of seats in a row increase as they retreat from the stage. In the stalls and pit, where the gangways are in a straight line, and the number of seats the same between the gangways in each row, there must of necessity be a loss of seats or reduction of the width of the gangway in order to obtain this arrangement; but where the stalls are placed in curved lines facing the stage, as at the Royal English Opera House, the same arrangement may be adopted.

The following method will explain the process of setting up a section of a dramatic theatre on the principles advocated by M. Lachéz, which is on the same lines as that already described above. Having decided the height of the stage above the floor of the front row of stalls, and the width of each row of the stalls, set up the top of a man's head at 4ft. 6in. in the front row, draw a line over it to the eye of the man behind in the second row. This will be 4ft. 2in. above the floor of the second row; the top of the head will be 4in. higher, making 4ft. 6in., as before. From this point draw a line to the eye of the man behind, in the third row, and repeat the same course for every row. If this system were adopted in

practice, the isacoustic curve would be determined by the width given to each row, and would, therefore, be steeper in the pit than in the stalls; but, as I shall explain, a modified form of the principle is carried out in actual work, for, were this system followed to the letter, as the accompanying diagram shows (Fig. 3), the pit floor would be far too steep for practical theatre building; and it is self-evident that the tiers over the pit would have to be raised in proportion to the head-room obtained, thus necessitating an auditorium of excessive height, out of all proportion.

Mr. Buckle describes what is perhaps the most usual method adopted by architects to find the rake of the seating, as follows:—"Having settled on the sectional drawing the position of the floor of the first row in the dress circle, a point should be fixed 3ft. 6in. to 4ft. below the stage floor at the front, or point nearest the spectators, and from this point an extended line touching the nosing of the first stepping. To this line the nosings of the other steppings should be tangent. Having fixed the position of the first row in the second circle, a line should be drawn from the point below the stage floor, as above described. To this line the nosings of the steppings should be tangent. This method is also applicable to the gallery."

In the accompanying diagram, the dress circle is sighted to a point on the orchestra floor, and the second circle and gallery to a point 3ft. 6in. below the stage.

Where the seats are arranged as shown in Fig. 2 it is evident that the line of sight is over

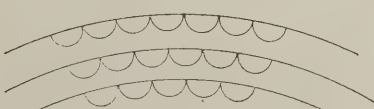


FIG. 2.

the shoulders, and not over the heads, of the occupants of the seats in the row immediately in front.

The rule of the London County Council with regard to the space to be allotted to each person is that the drawings deposited at the Council's office for the consideration and approval of the Council shall show the respective numbers of persons to be accommodated in the various parts of such premises, and the area to be assigned to each person, which shall not be less than 1ft. 8in. by 1ft. 6in. in the gallery, and not less than 2ft. 4in. by 1ft. 8in. in other parts of such premises. Roughly speaking, the width usually allowed for the pit is from 2ft. 2in. to 2ft. 4in.; for the stalls about 3ft., or rather more in some houses; for the dress circle 3ft.; for the upper circle, 2ft. 6in. to 2ft. 8in.; and the gallery 2ft. to 2ft. 3in.

After setting out the pit and stalls, the distance from the stage of the first row of the dress circle must be determined, and the height fixed of the soffits above the pit floor so as to allow comfortable head-room to the pittites, and to

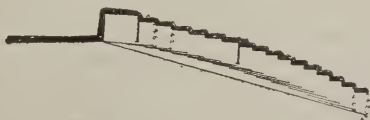


FIG. 3.

permit them standing on the seats when passing out. The eighth regulation of the London County Council forbids this height being insufficient, and "resulting in discomfort, semi-suffocation, and depression arising from the audience having a ceiling within a few inches of their heads," for it provides that where the first tier or balcony extends over the pit, stalls, or area, the height between the floor of the pit and the first tier shall not be at any part less than 10ft. The width of the rows of the dress circle will determine the sight lines, as in the case of the pit and stalls.

The upper circle front should be set back farther from the stage than the dress circle, so as to allow a portion of the latter to project into the auditorium, without an overhanging ceiling to obstruct sound and sight. The soffit of the front

row of the second circle should not be less than 8ft. from the stepping which it immediately overhangs. The line of sight of the second circle is found in the same way; but, of course, the gradient will become steeper and the width of the rows narrower, in accordance with the details already given.

The front of the gallery should be kept back from the stage, for similar reasons to that of the second circle, for then the second circle has plenty of air space above it, and the gradient of the steppings to the gallery is less steep than if its front were nearer the stage.

The height between the gallery floor and the ceiling is determined by the Council's rule that the height between the floor of the highest part of the gallery and the lowest part of the ceiling over the same shall not be less than 12ft.

For the guidance of some of my readers, I give some examples of the dimensions adopted from the curtain-line to the box-fronts of the dress circle, upper circle, and gallery of a few of the medium-sized London theatres. From curtain-line to front of—

	Dress Circle.	Upper Circle.	Gallery.
Savoy	34 6	43 10	48 6
Gaiety	36 0	45 0	47 6
Terry's	29 0	31 0	.. ..
Novelty	30 0	31 0	33 0
Sadler's Wells	41 0	46 0	.. ..
Prince of Wales	34 6	40 6	44 2
New Theatre, Cran-			
bourne-street	34 6	39 0	45 0
Shaftesbury	35 0	40 8	44 0
Lyric	38 8	44 9	48 3
Strand	31 9	nil.	39 6

Now to return to the isacoustic curves. The degree of steepness of the rake of the seats will, it will be seen from the above, vary with circumstances, such as whether it is necessary for the audience to look up from the stalls or down from the gallery; the more space that can be allowed from front to back, the less inclination will be requisite. When the audience are much below the stage, the true isacoustic curve will dip down slightly at its commencement; but under such circumstances a flat floor will answer all practical purposes.

All the foregoing strictly refers to seats in the centre of the house. I fear it is usual with some



FIG. 4.

architects to be content if they obtain a good sight-line for their centre seats, and to leave the side seats to chance. The farther the seats are away from the centre the more difficult is it to obtain a good sight-line for them. It is, therefore, as well to keep all seats on plan on as flat a curve as possible, so as to face the stage, instead of being placed sideways to it; but of the lines of front I shall have to speak more fully in my next chapter. I think the difficulty of sighting the side seats would have been frequently overcome had the designers been willing to test their lines of sight by more than the one section—*i.e.*, the longitudinal section. When other test sections are set up on radiating lines from the seats to the stage, then it is found that the steepings of the seats at the sides should be steeper than those in the centre.

To overcome some of this difference, the first, and sometimes first and second rows of the circle drop towards the proscenium, and the upper rows rise by gentle curves from the centre. This method, it will be remembered, was carried out with great care in Mr. D'Oyly Carte's New English Opera House. It is quite possible to determine on plans and sections the exact position of each individual seat in the auditorium, and its exact



GRAND ENTRANCE TO SHWAY DAGOHN PAGODA, RANGOON.

Eight above a given datum line. Those of my readers who saw the drawings of Mr. Carte's theatre, which were exhibited at the Association, will remember that the height of every seat from a datum line was figured in the working drawings. More especially is this necessary where the cantilever construction is adopted, as the exact rake of each radiating cantilever must be determined; it cannot be left to rule of thumb to pack up or lower the seating after the girders are in. The detail drawings of the sighting of a theatre must be accurate to within a quarter of an inch; the slightest defect in the front row will be increased in the second and augmented in each successive row, and still further emphasised in the tiers above.

A theatre with seats too high and too steep is almost as bad as one in which there are seats from which but a partial view of the stage can be obtained, for in the former the rake of the gallery must become so steep as to render it a trial to the nerves to sit there without being overcome with a feeling that one will fall headlong into the pit below.

A SANITARY CRUSADE THROUGH THE EAST AND AUSTRALASIA.

MR. ROBERT BOYLE has just completed another of his famous sanitary crusades round the world, this being the fourth time he has circled the globe in the interests of sanitary science and of the well-known ventilating and sanitary appliances which he is the inventor of, and which are manufactured by Messrs. Robert Boyle and Son, Limited, of London and Glasgow.

Two years ago we gave an account in these columns of Mr. Boyle's third tour round the world, when he travelled through Egypt, India, China, Japan, United States, and Canada, and last year an account of his tour through South Africa, in both of which he was highly successful in stimulating an interest in sanitary matters, and securing the adoption of his systems of ventilation and sanitation. Mr. Boyle seems to have been no less successful throughout the tour just concluded, in the course of which he visited Burmah, the Malay native States, Sumatra, Siam, Borneo, Java, Australia, New Zealand, Samoa, the Sandwich Islands, and America, where he surveyed the different buildings comprising the Chicago Exhibition, and furnished plans and estimates for the ventilation. Mr. Boyle, who has visited most of the great exhibitions held in different parts of the world during the last twenty-five years, is of opinion that the Chicago Exhibition Buildings are not only the largest he has ever seen, but architecturally the finest, being in both respects a great advance on the last Paris Exhibition; whilst the grouping

of the buildings and general arrangement of the grounds are a wonderful display of skill and ingenuity, which reflect great credit on the architect-in-chief, Mr. D. H. Burnham, of Chicago, who is also the architect of the Arts Building, a superb Classic structure which is intended to be permanent. We many mention *en passant* that the South African Exhibition at Kimberley is ventilated throughout with Mr. Boyle's system.

Agencies have been established in the different countries visited, and arrangements completed in each of the Australian Colonies and New Zealand for the manufacture of the latest improved form of the self-acting air-pump ventilator and other ventilating and sanitary appliances. As evidence of the confidence of the agents appointed in Australia with regard to sanitary prospects in the Colonies, we are informed that they have undertaken to sell within a specified time not less than £16,000 worth of air-pump ventilators, &c., representing ventilating contracts to the value of about £40,000; but at least double that amount of business is confidently expected to be realised.

Burmah was the first country visited by Mr. Boyle, which, though twice the size of the British Isles, is very sparsely populated, the total population not exceeding seven millions. The Chinese hold the bulk of the business of the country in their hands, and are evidently destined to overrun the whole of Burmah to the exclusion of the Burmese, who, though a fine people, are a happy-go-lucky, careless race, very correctly described as "the Irish of the East." Rangoon, the present seat of Government, and which has a population of about 200,000, is a very poor-looking city, the public buildings, what there are of them, and other erections—they can hardly be called houses—having an exceedingly dilapidated and decayed appearance, which is quite depressing; whilst the streets, which are wholly destitute of pavements or sidewalks of any kind, are ankle-deep in dust in dry weather and seas of mud in the rainy season. There seems to be an absence of public spirit amongst the European residents of Rangoon, which is quite exceptional in English communities in the East, and to this may be to a certain extent attributed the prevalence of small-pox, cholera, and other malignant diseases, which are periodically epidemic and never abate.

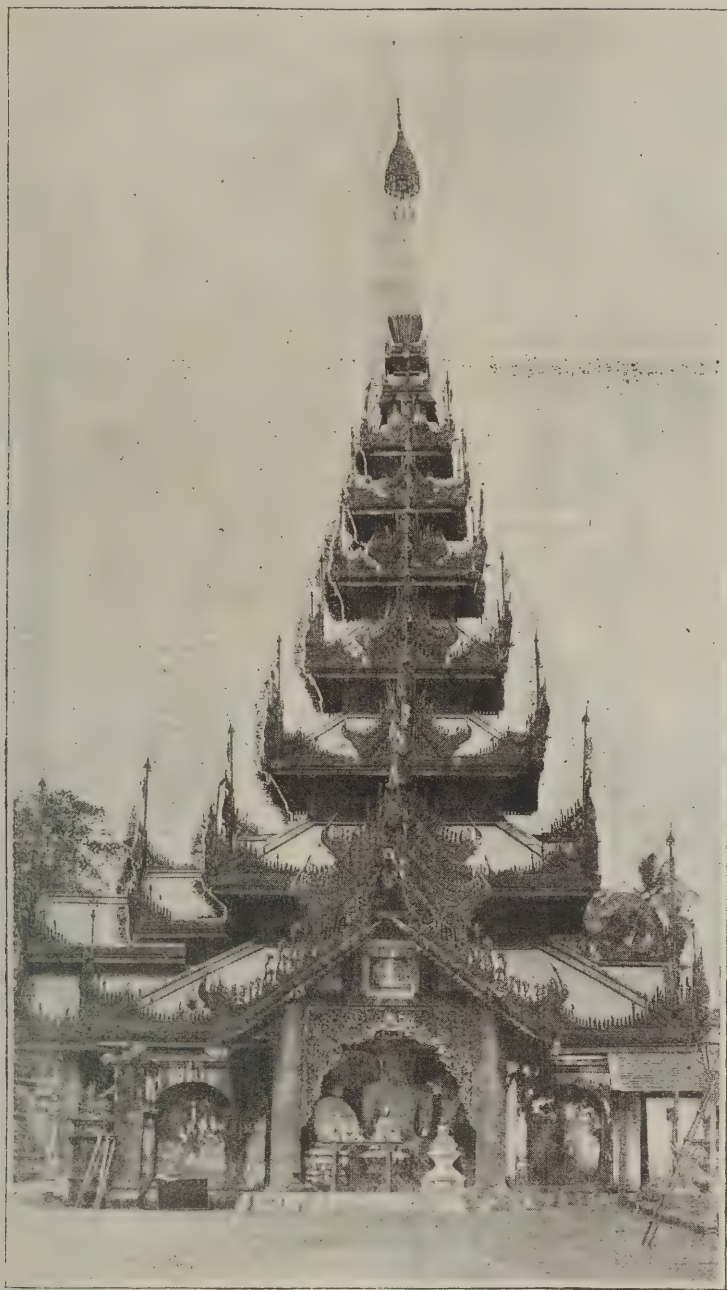
Europeans frequently suffer from what is known as the "Dhoba (washerman) itch," which is contracted through body-linen, &c., being washed in still water along with the dirty clothes of the natives, many of whom suffer from loathsome diseases, such as leprosy, scrofula, &c. The "washing" is usually "done up" in the filthy hovels of the natives, where further opportunities are afforded for the acquisition of disease-germs and other objectionable and animate matter,

which it is unnecessary to more particularly specify. Dhoba itch is simply blood poisoning, which manifests itself in various disagreeable forms, such as a kind of ringworm, and is very difficult to get rid of.

The street corners of the principal thoroughfares in Rangoon are usually ornamented with animated monuments in the form of leper-beggars, especially at night time, when special facilities are afforded the unwary wayfarer to fall over them, as the streets are then in almost total darkness, the public lighting consisting of a few miserable oil-lamps placed at remote distances from each other, and as often as not left unlighted. In the early morning the town is usually enveloped in a dense white fog or mist, which penetrates into the houses and saturates everything. This is the cause of severe chills being contracted, and indeed there seem to be thousands of people afflicted with the most violent coughs, the sound of which constantly greets the ear all over the town day and night. Funeral processions are one of the commonest sights in the streets, and the public gharries or cabs are commonly used for the conveyance of small-pox, cholera, and other patients; whilst the principal street-corners are about equally divided between Chinese grog-shops and medical halls, these being the largest and most thriving places of business in the town.

Insect life puts itself strongly in evidence, and wherever there is a light to attract them, the floor, or more often the dinner-table, is soon covered with carcasses of thousands of different varieties of moths and flies, which fall down on the top of one very much in the form of a shower bath. Some of these insects are of great size, one, a green moth, measuring 12in. across the wings. These, along with mosquitos, mammoth spiders, cockroaches as large as rats, centipedes, lizards, and snakes, with which most houses are infested, combine to make home life in Burmah rather more lively than agreeable.

The steps of the great Shway Dago Pagoda, the Mecca of the Indo-Chinese Buddhist, one of the most wonderful temples in the world, are closely lined from top to bottom with lepers, suffering from that loathsome disease in its worst forms and most advanced stages. A number of the poor victims whom Mr. Boyle examined were found to be half eaten away, and presented a most sickening and awful spectacle, whilst others afflicted with the most horrid diseases were simply one mass of putrid sores of a greenish colour, from which exhaled a fearful stench. Mr. Boyle, who has made a special study of leprosy in the East and Africa, states that he has nowhere else seen the disease in such terrible and ghastly forms, or where so little was done for the alleviation of the sufferings of the wretched victims or the pre-



TEMPLE AT THE SHWAY DAGOHN PAGODA, RANGOON.

vention of the propagation of the disease. As it is now generally admitted by the medical profession that leprosy is contagious, nothing else could be expected but that the disease should be rampant in the country, when in the very places where the people congregate in dense masses, during the festivals there being sometimes as many as 50,000 pilgrims present, this sort of thing is allowed to exist, and that, too, with the direct sanction of the authorities, who have made no provision whatever worthy of the name for the cure or treatment of these poor lepers, who are thus compelled to resort to begging to keep themselves in existence. Such a state of things in a British possession is a public scandal and a disgrace to those who are responsible for it.

The water-supply of Rangoon, which is brought from a lake in the hills, is fortunately good, and a system of drainage has been introduced after years of opposition to the scheme, consisting of 6in. pipes with pneumatic ejectors, which will, when complete, prove of great value to the town; but at present the ventilation is very defective, and the supplementary drains or gutters for carrying off the surface water should be covered over to prevent the natives using them as they do at present as common sewers. When the whole of the main drainage was completed, it was discovered that it had been omitted to make it compulsory on the inhabitants to connect their houses with the drains, and the whole question

had to be fought over again before the necessary by-law was passed, which has only just been done. It is proposed to build a Jubilee Hall in Rangoon, the plans for which have been prepared, the Boyle system being specified for the ventilation; but as the amount required is not yet fully subscribed, it may be some time yet before it is erected.

Mr. Boyle proceeded to Mandalay, a railway journey of 380 miles, where he found the sanitary condition of the city fairly good, though there is no system of drainage of any kind, the excreta being collected and thrown into the river. The dogs and pigs with which the streets are infested form most efficient scavengers, and it is certainly a cleaner and healthier town than Rangoon.

The ex-King Theebaw's Palace, which is situated in a walled inclosure one-and-a-half miles square, consists of some very fine examples of Burmese architecture and wood-carving, lavishly covered with gold leaf, as are also most of the pagodas in Mandalay, which compare favourably with the finest temples in Japan. Unfortunately, the great fire which destroyed four-fifths of Mandalay since Mr. Boyle's visit, consumed many of these buildings, including the palace, which is a decided loss to art.

The great Arakan pagoda at Mandalay, in which is enshrined the famous brass Gautama, is one of the sights of the world, and if visited during high festival, as seen by Mr. Boyle, when

pilgrims are assembled from all parts of the country, it is a sight never to be forgotten, and unequalled as a gorgeous spectacle of Eastern display. Here, as at Rangoon, the lepers are present in hundreds, and they so crowd the entrances that you have to carefully pick your way through them on entering and leaving the pagoda.

The "incomparable" pagoda is a remarkable building of vast size and of peculiar construction, but it would take volumes to describe even the principal temples in Burmah, which is dotted from one end to the other with them, many of them of great beauty. There are said to be over 30,000 Pohngyees or Buddhist monks in Mandalay who, as Buddhism, which numbers over 400,000,000 adherents, is merely a very pronounced form of Atheism, and acknowledges no Supreme Deity, act as teachers and moral examples to the people, which are the sole functions of a Buddhist priest. Pagan, an ancient capital of Burmah, situated on the Irrawaddy between Mandalay and Rangoon, is said to contain over 10,000 temples of various sizes and styles of architecture, covering 16 square miles. Mr. Boyle states that, as seen from the river, it is one of the grandest and most-impressive sights he has ever beheld.

Lower down the Irrawaddy, below Prome, there is a large cliff, about two miles long and 300ft. high, in the face of which, carved out of the rock, are innumerable figures of Buddha ranged in tiers from the bottom to the top the whole length of the cliff. Mr. Boyle computed that some of the figures were not less than 20ft. in height, many of them being richly gilded, the whole forming a very brilliant and curious sight. A few miles up the Irrawaddy from Mandalay is situated the Minjohn pagoda, a high mass of brickwork 400ft. square at the base, and originally intended to rise to a height of about 500ft.; but during the course of construction it was struck with lightning, and never completed. As it stands it is the largest brickwork structure in the world. Close beside it is the second largest bell in the world, being next in size to the great bell in Moscow. It measures 18ft. in height, 11ft. is 17ft. diameter at the widest part, the metal being 18in. thick, and weighs close on 100 tons. In the province of Pegu there is a recumbent figure of Buddha, supposed to be the largest figure in the world. It is said to measure about 270ft. in length by 70ft. at the shoulders. There is also a very curiously-balanced rock, on the top of which is erected a temple, but how it retains its position seems almost a miracle.

When Mr. Boyle visited Penang two years ago he found the sanitary arrangements in a very defective state, but steps are now being taken to improve the drainage of the town, £3,000 having been voted by the authorities for that purpose. The water supply, which is of good quality, is also to be added to. A city engineer has recently been appointed who will doubtless effect further improvements in this direction. Malacca is a well-arranged and remarkably clean town, and is considered a healthy place. The ruins of the Jesuit cathedral, where St. Frances Xavier laboured and died, are very interesting. It is strongly built of lava blocks, the interior being of Italian design. There are some finely-carved tombstones in the church, dating from the 16th century.

Mr. Boyle was very favourably impressed with Kwala Lumpur, the capital of the native state of Selangor. The Sultan, though a very old man, is most enterprising and public spirited, spending the bulk of his revenue in developing and improving his territory. The sanitary arrangements of Kwala Lumpur have received careful attention, and there is a good water supply. The European and native hospitals, which are constructed according to the latest and most improved designs, are models of cleanliness and order, and excellently managed. Owing to the dense jungles and swamps, malarial fever is very prevalent all over the country, and especially so at Klang, the port of Selangor connected with Kwala Lumpur, twenty-three miles distant, by rail.

In Pahang, the adjoining native state, Mr. Boyle found a rebellion in full swing, and the country in a very unsettled state, owing to the massacres that were being perpetrated. Travelling through the jungle even with an escort was both difficult and unsafe—a very different state of affairs to that at Johore, where all was peace and prosperity, the Sultan, to whom Mr. Boyle had letters of introduction, being one of the most enlightened potentates in the East.

Acheen, in Sumatra, is a very unhealthy place, and the sanitary arrangements are most defective. The Dutch colonists, unlike their countrymen in Java, seem to be quite indifferent to everything not immediately connected with their own personal interests, and the public health suffers accordingly. A war has been in progress since 1873 between the Dutch and the Sultan of Acheen, and which seems likely to continue for many years to come. This, of course, has a prejudicial effect on the progress of the country, and greatly retards its development. Delhi, further down the coast of Sumatra, is also an exceedingly unhealthy place. It and Acheen may be considered the two most unhealthy places in the East, the malaria which arises from the mangrove swamps being of a deadly character.

The sanitary condition of Singapore has been considerably improved since Mr. Boyle's previous visit, and it is now a fairly healthy place to live in. An unlimited supply of good water has been provided, which has greatly contributed to the health of the inhabitants.

THE GUILDHALL.

THE London County Council are now considering the advisability of erecting a palatial Hotel de Ville, in which to carry on its official work. Whatever may be the result of their deliberations, and no matter what kind of magnificent building may be erected, it will never be able to compete with ancient Guildhall, the home of the Corporation of London, either in historical associations or prestige. Cruel indeed would be the hand which would dare to raze these almost sacred stones; even Sir W. Harcourt, with all his ardent desire for municipal reform, has stated that he would no more dare to touch Guildhall than he would Westminster Abbey. If, then, these two buildings may be compared in historical importance, a short consideration of the building that has for many centuries been the centre of civic life may, it is hoped, prove interesting.

Looking at a plan of Guildhall dated 1750, we see on the right of the courtyard, of which the pigeons have now taken possession, a large building known as Blakewell Hall; this was used as a market for the sale of cloth. Our forefathers had little faith in free trade; so, in order to prevent foreign competition, very stringent rules were made by Henry VIII. Next door, to the south, was the Guildhall chapel. Some interesting relics from this building are now preserved in the Church of St. Lawrence Jewry, and here the Lord Mayor and Corporation used to assemble for worship.

On the right of the Guildhall yard was a lofty piazza, having numerous columns; here were corporation offices for the solicitor and others. Passing through the Guildhall to the north, we find the residences of the two great corporation officers, the Chamberlain and the Town Clerk. Here also was a spacious garden, the office for the stamping of weights and measures, the house of the keeper of the Guildhall, and the corporation bakehouse and confectionery.

If we are to believe Stowe, the first Guildhall was on the east side of Aldermanbury. This street was so named because the aldermen held their court or "bury" on this spot. As a support to what Stowe asserts, we have the evidence of a deed enrolled in the court of Hastings in 1293, in which certain houses in the parish of St. Lawrence Jewry are described as being bounded on the east side by the "bury" of the Guildhall. There was undoubtedly a Guildhall as far back as the time of Edward the Confessor; the building which existed at that remote period was probably one of small dimensions, for an old record of the year 1411 tells us: "In this yere was ye Guyldre halle of Lodon began to be newe edified, and of an old olde and lytell cotage made into a fayre and goodly house as it now appereth."

There was, it seems, a determination to raise the money for this building with very little regard to the sources from which it came. The companies gave large benevolences, prisoners had their crimes forgiven on payment of heavy fines, the amount of which went towards the new building; "extraordinary fees were raised, amercements and other things employed during seven years."

Old London Bridge was constructed partly by the funds raised by a tax on wool, St. Paul's by a tax on coal, Guildhall had to look in many

directions to get the money to raise its walls. Henry V., it appears, took an interest in the construction of this municipal building. He granted to the City a free passage of four boats by water and as many carts by land, with servants to each, to bring lime, ragstone, and freestone for the work of the Guildhall. The aldermen contributed liberally to fill the windows with stained glass, in which they placed their arms; while Henry VI., as one of the executors of Richard Whittington, of cat and rat celebrity, paid £15, and on another occasion £23, towards paving the Guildhall with Purbeck hardstone.

What were the subjects depicted in the windows of the ancient Guildhall we do not know; but they aroused the animosity of the Parliament of the Commonwealth, for we find it recorded that the following resolution was passed at a meeting of the Court of Aldermen, 5th October, 1642:—"ITEM.—This day, upon a motion made unto this court, it is ordered that the last and present sheriffs shall view what pictures are in the windows of the Guildhall and Chappell that are commanded by order of the Comons house in Parliamt^t to bee pulled down, and certify unto this Court what they find, and their opinions towching the same."

The walls of the ancient hall were only 30ft. in height; these were increased by another 20ft. after the fire of London. The most attractive part of the building was, in fact, on the outside at the southern entrance. Here, in appropriate niches, were figures representing Religion, Fortitude, Justice, Temperance, Law, and Learning, the whole being surmounted by the arms of the Corporation of London.

This front was taken down and the present one erected by George Dance in 1789. The design is a mixture of styles which has provoked considerable controversy and ridicule. Some writers, however, maintain that the City arms, supporting the Cap of Maintenance and the Maces, with the civic motto, "Domini dirige nos," really present an imposing appearance as the spectator approaches the hall. There may have been some truth in this when the whole of the front was complete. Now that the east half has been taken down to erect a corridor and approach to the new library and museum, the appearance is anything but imposing. But here the public have benefited by the destruction of Dance's work. If we look at the old building as described by J. B. Nicholls in his "Brief Account of the Guildhall," published in 1819, and to the large and most elaborate work, "An Historical Account of Guildhall," prepared by Mr. J. E. Price, under the directions of the Library Commissioners of the Corporation of London, we shall see that the present porch retains much of its original beauty and richness of style. In the southern part the walls are divided into Gothic apartments, the roof transversely groined, stone ribs springing from six-light circular columns, with octagon bases and capitals, and enriched at the intersections with sculptured bases. The bosses bear the arms of Edward the Confessor and Henry VI.; among the others are the Eagle of St. John, the Lion of St. Mark, and the Angel of St. Matthew.

Nicholls tells us, "Only a short period had these noble buildings been completed and enriched in their architecture and furniture, with every costly embellishment that scientific taste and liberality could bestow, when the melancholy conflagration of London in the year 1666 destroyed the greater part, with the exception of the main walls, which alone escaped from the consuming element." Previous to the Great Fire, the Hall had an oaken roof; no design of this can now be found. The building was, in general, restored under the directions of Sir Christopher Wren, a flat roof with square panels taking the place of the one destroyed. This again gave way in 1864 to the present magnificent oaken roof, designed by Horace Jones (afterwards Sir Horace), the City architect, with the assistance of Digby Wyatt, F.S.A., and Edward Roberts, F.S.A. This roof, when illuminated by the electric light on Lord Mayor's Day, presents a truly magnificent appearance. The walls of the Guildhall are 4ft. thick, supported externally by nine massive solid buttresses of three stories on either side and four at each end, having four octagon towers or turrets, one at each angle. These are supported by cupolas, spires, and vanes at an elevation of about 100ft.

Mr. Price, in his elaborate description of the interior of the Guildhall, tells us that the north

and south walls are divided into eight bays or divisions, formed by three clustered shafts or pillars, connected vertically by intermediate mouldings, the whole having moulded bases with stilted plinths, and surmounted by similar clustered capitals with sculptured floriated enrichments, all in gilt. These shafted piers rise to the soffit of the main cornice. Traceried and cusped panelling are found on the sides, and also under the gallery on the west. On the summit of the sides is a frieze, crowned with a cornice. The frieze contains a series of mottoes, in raised Gothic letters, with supporters and shields of arms relating to England, the Corporation of London, and the twelve great Livery Companies. The east end of the hall has a raised dais, the wall at the back and one bay on each side being lined with very rich and elaborate oak panelling. The screen at the east end is formed of open panels furnished with arched heads and mouldings, and divided by pillars with caps and bases. The floor is paved principally with white stone arranged in panels, divided by bands of tiles; these panels are enriched with incised quatrefoil and ornamental figures, the arms of England, of the Corporation of London, of Edward the Confessor, and foreign nations all being filled in with lead. This truly magnificent hall is 152ft. in length, 49½ft. in width, and 89ft. from the pavement to the ridge of the roof.

It is not intended in this article to give a detailed account of every particular of the Guildhall, but only to point out those chief features which so many pass by unnoticed. We cannot forbear a few words to their chief features, which are sure to attract even the most careless of observers. The stained-glass windows are numerous and divergent in their character; the great window to the west is in memory of the Prince Consort, that to the east was erected by the Lancashire operatives in acknowledgment of help during the cotton famine. Important events connected with the history of the City are here commemorated. Here is the Conqueror holding the first charter granted to the City of London, and still preserved in the City archives; here Richard I. is represented granting the charter conveying to the Corporation of London the conservancy of the Thames: Wat Tyler's death is closely connected in one window with the knighting of Lord Mayor Walworth, who killed him. Old London Bridge, the Tower, and Epping Forest are all exhibited in brilliant colours.

The Guildhall monuments stand out clearly as memorials of our great statesmen, Lord Nelson, Earl Chatham, Wm. Pitt, Wellington, and Lord Mayor Beckford giving some good advice to George III. All these are in a good state of preservation. The City giants, Gog and Magog, have looked from their pedestals in the gallery on many a civic banquet. These are 15ft. in height, and were carved by Richard Saunders in 1708. These figures took the place of two wicker giants who graced the Lord Mayor's procession in former years; they were first used at the restoration of Charles II., when they were placed on a triumphal arch at the corner of King-street.

One of the most interesting parts of the Guildhall is the alderman's court-room; this was built in 1614, and though small, is a truly magnificent chamber. The ceiling is ornamented with an allegorical painting by Sir Thomas Thornhill, representing the City of London, with a mural crown on her head, holding a shield emblazoned by the City arms, and attended by Minerva and two boys. Allegorical figures, representing Prudence, Justice, Temperance, and Fortitude, are also here. The walls are panelled in oak and gilt mouldings; the windows and panels contain the arms of past lord mayors. In old times the walls were covered with tapestry representing the history of Nebuchadnezzar. The old council chamber, erected by George Dance in 1776, now used as a law court, is an interesting chamber; but the new chamber erected by Horace Jones in 1884 is undoubtedly the most glorious municipal chamber in the kingdom. The new library and museum, erected in 1873, is one of the most useful parts of the Guildhall.

A part of the Guildhall usually missed by visitors is perhaps the most interesting part of all. We refer to the crypt. This is part of the ancient building erected in 1411, and which escaped the Fire. It is finest and the most extensive undercrypt in London. In 1841 a large amount of rubbish which had accumulated since the Great Fire was cleared away, and exhibited the crypt in all its beauty. It is 75ft. by 45ft.,

and 12ft. 6in. from floor to ceiling. The whole is divided into three aisles of four arches, six clusters of columns, fourteen half and quarter columns, with bases and capitals of Purbeck marble, from which spring the stone-ribbed groins of the vaulting; the twelve principal ones have shields, the arms of Edward the Confessor being conspicuous here, along with the arms of the Corporation of London. In the crypt there are several great gas-ovens, in which are cooked the civic banquets. At times when all these are cleared away, and the crypt well lighted, its proportions can then be well observed.

At the present time (August, 1892), though the offices are doing little work, it being vacation time, there are signs of great vitality in the historic Guildhall. The roof of the great hall is being regilded, the electric light is in course of installation in the library and the great hall, the aldermen's court-room is being elaborately decorated, new panels are being put for the arms of future lord mayors, and there seem on every hand preparations for a long and useful career to be added on to the 700 years during which the Corporation has already existed.

PRICES.*—XLIV.

(All Prices have had the Trade Discount taken off, and a Profit added.)

IRONMONGER (continued).

		£	s.	d.
NORFOLK LATCHES, fixed, including screws—				
No. 1 common japanned	each	0	1	0
2 ditto ditto	ditto	0	1	1
3 ditto ditto	ditto	0	1	2
4 ditto ditto	ditto	0	1	3
No. 1 best ditto				
2 ditto ditto	ditto	0	1	3
3 ditto ditto	ditto	0	1	4
4 ditto ditto	ditto	0	1	5
No. 1 extra well-made ditto				
2 ditto ditto	ditto	0	1	3
3 ditto ditto	ditto	0	1	4
4 ditto ditto	ditto	0	1	5
SUFFOLK LATCHES, fixed, including screws—				
No. 1 common quality	ditto	0	1	1
2 ditto ditto	ditto	0	1	2
3 ditto ditto	ditto	0	1	3
4 ditto ditto	ditto	0	1	4
No. 1 best ditto				
2 ditto ditto	ditto	0	1	3
3 ditto ditto	ditto	0	1	4
4 ditto ditto	ditto	0	1	5
No. 1 extra strong ditto				
2 ditto ditto	ditto	0	1	4
3 ditto ditto	ditto	0	1	5
4 ditto ditto	ditto	0	1	6
CANADIAN Latches, fixed, including screws—				
Japanned and strong	each	0	1	4
Ditto best	ditto	0	1	6
GOTHIC Latches, fixed, including screws—				
Japanned, with jointed handle	each	0	2	6
Berlin black ditto 9½ by 2½	ditto	0	3	6
BRASS Thumb Latches, fixed with brass screws—				
5in. high, all brass	each	0	2	3
9 ditto ditto	ditto	0	2	6
9½ ditto ditto	ditto	0	2	10
9½ ditto ornamental	ditto	0	4	6
9 brass with china handle	ditto	0	4	3
9 ditto ditto	ditto	0	4	10
10 ditto ditto	ditto	0	5	6
Ornamental brass, with glass grip	ditto	0	6	9
Ditto amber glass ditto	ditto	0	7	9
GOTHIC Furniture for latches, fixed—				
No. 1 light and plain	each	0	1	6
2 medium ditto	ditto	0	2	6
3 strong ditto	ditto	0	3	6
4 ornamental and strong	ditto	0	3	3
HANDLES, &c., for doors, fixed—				
No. 939 5in. plain bow handles for baize doors, &c.	ditto	0	0	8
6in. ditto ditto	ditto	0	0	10
7in. ditto ditto	ditto	0	0	11
No. 864 5in. ornamental ditto	ditto	0	0	7
106 5in. ditto ditto	ditto	0	0	2
Ditto ditto cranked	ditto	0	1	4
7in. handle of china with brass plates	ditto	0	1	9
8½in. brass, no plate, and twisted handle	ditto	0	2	0
12in. ditto ditto	ditto	0	2	10
12in. steel, bronzed and ornamental	ditto	0	4	0
10in. polished	ditto	0	2	6
10in. plain narrow brass plate, with rounded ends and plain round handle	ditto	0	3	0
12in. ditto ditto	ditto	0	3	6
14 ditto ditto	ditto	0	4	3
10 ditto wider	ditto	0	5	3
12 ditto ditto	ditto	0	4	0
10in. wide plate with bold beaded grip	ditto	0	4	6
12 ditto ditto	ditto	0	5	6
Heavy Gothic pattern plate with ebony grip	ditto	0	5	3
TURNBUCKLES, fixed—				
1in. japanned iron	ditto	0	0	7
1½ ditto ditto	ditto	0	0	8
1½ ditto ditto	ditto	0	0	9
1in. brass, light make	ditto	0	0	6
1½ ditto ditto	ditto	0	0	7
1½ ditto ditto	ditto	0	0	8
1½ ditto ditto	ditto	0	0	9

		£	s.	d.
1in. strong pattern				
1½ ditto ditto	ditto	0	0	7
1½ ditto ditto	ditto	0	0	8
1½ ditto ditto	ditto	0	0	9½
1½ ditto ditto	ditto	0	0	11
1in. No. 200 patent, brass				
1½ ditto ditto	ditto	0	0	7
1½ ditto ditto	ditto	0	0	8
1½ ditto ditto	ditto	0	0	9
1½ ditto ditto	ditto	0	0	8
1½ ditto ditto	ditto	0	0	8½
1½ ditto ditto	ditto	0	0	9
1½ ditto white and gold	ditto	0	0	10
1½ ditto ditto	ditto	0	0	11
1½ ditto black and gold	ditto	0	0	10½
1½ ditto ditto	ditto	0	0	11½
No. 808 cupboard spring catch of japanned iron				
ditto	ditto	0	0	5
No. 900 cupboard catch to spring				
ditto	ditto	0	0	5½
Ditto ditto brass	ditto	0	0	9
HINGED AND OTHER HASPS AND STAPLES, fixed—				
8in. japanned hasp and staple				
4 ditto ditto	each	0	0	2½
5 ditto ditto	ditto	0	0	3½
6 ditto ditto	ditto	0	0	4
7 ditto ditto	ditto	0	0	4½
No. 635, japanned and hinged, 4½in. by 2½in., strong				
4 (633) ditto ditto	ditto	0	0	11
5 ditto ditto	ditto	0	0	8
6 ditto ditto	ditto	0	0	9
8 ditto ditto	ditto	0	0	11
FRENCH DOOR-LATCHES, fixed—				
No. 33, with ebony or buffalo handles, iron enamelled cases				
35 ditto ditto	ditto	0	9	0
33 nickel-plate or brass	ditto	0	10	6
35 ditto ditto	ditto	0	18	6
36 iron enamelled to look like nickel-plate or brass	ditto	0	18	0
Lock handles (lever) Berlin black	ditto	0	2	0
Ditto ditto polished brass	ditto	0	3	3
Ditto ditto ebony grip	ditto	0	4	0
Ditto ditto twisted grip	ditto	0	4	3
Single cranked furniture, china knob	ditto	0	1	2
Ditto ditto brass	ditto	0	1	3
Ditto ditto ebony	ditto	0	1	4
Ditto ditto oak	ditto	0	1	5
1½in. cranked latch furniture (china) ... per set				
1½ ditto ditto ditto	ditto	0	1	9
2 ditto ditto ditto	ditto	0	1	11
1½ ditto brass ditto	ditto	0	1	5
1½ ditto ditto ditto	ditto	0	1	8
2 ditto ditto ditto	ditto	0	1	11
1½ ditto ebony or oak	ditto	0	2	3
2 ditto ditto	ditto	0	2	6
2 ditto crystal	ditto	0	5	6
2½ ditto ditto	ditto	0	6	6
2 ditto amber	ditto	0	7	6
2½ ditto ditto	ditto	0	8	9
DOOR FURNITURE, fixed—				
6in. cast roses and well-made Simplex rim furniture				
7 ditto ditto ditto ditto	ditto	0	0	9
8 ditto ditto ditto ditto	ditto	0	0	9½
6 ditto ditto ditto mortise	ditto	0	0	10½
7 ditto ditto ditto furniture	ditto	0	0	11½
8 ditto ditto ditto ditto	ditto	0	1	4
4in. Mace's latch furniture				
5 ditto ditto	ditto	0	1	1
6 ditto ditto	ditto	0	1	2
4 ditto best quality, with cast roses	ditto	0	1	2
5 ditto ditto	ditto	0	1	3
6 ditto ditto	ditto	0	1	5
6 ditto rim furniture	ditto	0	0	11
7 ditto ditto	ditto	0	1	0
8 ditto ditto	ditto	0	1	1
9 ditto ditto	ditto	0	1	4
6 ditto second quality	ditto	0	1	3
7 ditto ditto	ditto	0	1	4½
8 ditto ditto	ditto	0	1	5½
6 ditto best quality	ditto	0	1	4
7 ditto ditto	ditto	0	1	5½
8 ditto ditto	ditto	0	1	7½
6 ditto mortise ditto	ditto	0	1	3
7 ditto ditto	ditto	0	1	8
8 ditto ditto	ditto	0	1	9
6 ditto second quality	ditto	0	1	7
7 ditto ditto	ditto	0	1	9
8 ditto ditto	ditto	0	1	10½
6 ditto best quality	ditto	0	1	11
7 ditto ditto	ditto	0	2	2
8 ditto ditto	ditto	0	2	4
6in. milled edge, Mace's, rim	ditto	0	1	4
7 ditto ditto	ditto	0	1	8
8 ditto ditto	ditto	0	1	10
9 ditto ditto	ditto	0	2	1
6in. milled edge, Mace's, mortise	ditto	0	2	2
7 ditto ditto	ditto	0	2	4
8 ditto ditto	ditto	0	2	6
1½in. Queen Anne pattern, Mace's, rim	ditto	0	3	6
2 ditto ditto ditto	ditto	0	4	2
2½ ditto ditto ditto	ditto	0	4	8
1½ ditto mortise	ditto	0	4	3
2 ditto ditto	ditto	0	4	9
0½ ditto ditto	ditto	0	5	9
2½in. Pitt's octagon, rim	ditto	0	5	0
2½ ditto ditto	ditto	0	5	6
2½ ditto ditto	ditto	0	7	0
3 ditto ditto	ditto	0	7	9
2½ ditto mortise	ditto	0	5	9
2½ ditto ditto	ditto	0	6	4
2½ ditto ditto	ditto	0	7	9
3 ditto ditto	ditto	0	9	0
White Porcelain for 6in. rim	ditto	0	0	10
Ditto ditto mortise	ditto	0	1	1
Brown mineral rim	ditto	0	0	9
Ditto ditto mortise	ditto	0	1	0
White china furniture, Wilkes' spindle for mortise locks				
ditto	ditto	0	1	0
Black ditto	ditto	0	1	1
Cream ditto	ditto	0	1	½
White and gold ditto	ditto	0	1	6
Black and gold ditto	ditto	0	1	7

			£	s.	d.
Cream and gold furniture	each	0	1	8	
White and gold fern ditto	ditto	0	2	3	
Black and gold ditto	ditto	0	2	6	
Painted moss rose, and gold border on white ditto	ditto	0	3	9	
Painted lily and gold border on white ditto	ditto	0	3	11	
2½in. oak or ebony, and Wilkes' spindle	ditto	0	1	7	
2½ ditto ditto	ditto	0	2	3	
2½in. boxwood, maple, or walnut ditto	ditto	0	2	3	
2½ ditto ditto	ditto	0	2	6	
2½in. oak or ebony, and Pitt's roses	ditto	0	3	9	
2½ ditto ditto	ditto	0	4	6	
2½in. walnut, rosewood, box, or maple	ditto	0	4	0	
2½ ditto ditto	ditto	0	4	9	
2in. ebony or oak reeded and Pitt's rose	ditto	0	5	6	
2½ ditto ditto	ditto	0	6	4	
2½ ditto ditto	ditto	0	7	3	
2½ ditto with Wilkes' spindle	ditto	0	2	6	
2½ ditto ditto and ditto	ditto	0	2	9	
2½ ditto ditto and ditto	ditto	0	2	11	
2½in. ebony or oak, Gothic with carved centre and shaped rose	ditto	0	5	3	
2½in. ditto ditto	ditto	0	5	6	
2½ ditto ditto	ditto	0	6	0	
TONKS' KEYED LOCK FURNITURE, fixed—					
2in. brass rim furniture	ditto	0	4	0	
2½ ditto ditto	ditto	0	4	6	
2½ ditto ditto	ditto	0	4	9	
2½ ditto ditto	ditto	0	5	3	
2½ ditto ditto	ditto	0	5	9	
2in. ditto ditto mortise	ditto	0	4	6	
2½ ditto ditto ditto	ditto	0	5	0	
2½ ditto ditto ditto	ditto	0	5	3	
2½ ditto ditto ditto	ditto	0	5	8	
2½ ditto ditto ditto	ditto	0	6	0	
ANDREWS' SELF-FASTENING LOCK FURNITURE, fixed—					
1½in. brass rim	Per set.				
1½ ditto	ditto				
1½ ditto	ditto				
2 ditto	ditto				
2½ ditto mortise	ditto				
2½ ditto ditto	ditto				
2½ ditto ditto	ditto				
CHINA FINGERPLATES, &c., fixed, and brass screws—					
Plain shapes, white china	each	0	0	5	
Ditto black	ditto	0	0	6	
Ditto white and gold	ditto	0	0	10	
Ditto black and gold	ditto	0	0	11½	
Ditto white and gold fern	ditto	0	1	5	
Ditto black and gold ditto	ditto	0	1	6	
Ditto painted moss rose and gold border on white	ditto	0	1	8	
Ditto painted lily and gold border on white	ditto	0	1	10	
Rounded both ends, moulded edges, and superior finish, white china	ditto	0	0	6	
Ditto black ditto	ditto	0	0	7	
Ditto white and gold	ditto	0	0	11	
Ditto black and gold	ditto	0	1	1	
Ditto white and gold fern	ditto	0	1	8	
Ditto black and gold ditto	ditto	0	1	9	
Ditto painted moss rose and gold border on white	ditto	0	1	10	
Ditto ditto lily and gold border on white	ditto	0	2	0	
Decorated china finger plates, rounded both ends, pink, or gold, and white bands	ditto	0	2	6	
Ditto with buff ground and floral design	ditto	0	3	8	
Ditto black, chocolate, and gold, with Grecian key border	ditto	0	2	8	
Reeded Queen Anne pattern china, cream colour	ditto	0	0	9	
Ditto extra wide with raised patterns	ditto	0	0	10	
Long crystal plates	ditto	0	3	0	
Ditto amber ditto	ditto	0	4	2	
Ditto raised old diamond pattern	ditto	0	6	3	
Ditto amber ditto	ditto	0	8	0	
BRASS FINGERPLATES, fixed—					
10½in. plain plates, moulded edges, and buttons	ditto	0	1	7	
7½in. ditto ditto	ditto	0	1	5	
12in. relief patterns, panelled and bordered	ditto	0	1	8	
9in. ditto ditto	ditto	0	1	6	
Square plain reeds, long	ditto	0	1	0	
Ditto ditto short	ditto	0	0	10	
Reeded borders and relief pattern centres	ditto	0	2	6	
Ditto ditto short	ditto	0	2	3	
11 by 3 Sunflower relief pattern	ditto	0	2	8	
Ditto ditto short	ditto	0	2	6	
WOOD FINGERPLATES, fixed—					
Shaped ends and moulded edges of ebony, oak, maple, walnut, zebra, cocoon, or satin wood	each	0	1	2	
Ditto ditto superior finish	ditto	0	1	6	
Reeded oak or ebony	ditto	0	1	11	
Ditto walnut, rose, or box	ditto	0	2	6	
Shaped Gothic, with brass rosettes, from 2s. 6d. to 6s. 6d.					
SASH FASTENERS, fixed—					
Stamped iron bronze, with brass or china knob	each	0	0	7	
Ditto ditto strong	ditto	0	0	8	
Cast-iron, with bronze or ebonyised knob	ditto	0	0	9	
Cast brass, with open plate and brass or china knob	ditto	0	0	9	
Strong solid brass, with wood knob	ditto	0	0	10	
Ditto with china knob	ditto	0	0	10½	
Ditto with cover-plate	ditto	0	0	11	
Strong and solid brass, with reeded brass knob	ditto	0	1	1	
3in. brass, with china and two gold lines	ditto	0	1	4	
2½in. strong brass fastener, with dovetail key and brass knob	ditto	0	1	4	
3in. ditto ditto	ditto	0	1	5	
Oak or ebony knobs extra	ditto	0	0	1½	
No. 1 Willett's patent, light	ditto	0	1	1	
2 ditto ditto medium	ditto	0	1	3½	
3 ditto ditto strong	ditto	0	1	7	
4 ditto ditto extra strong	ditto	0	2	2	
Skipworth's patent automatic, stamped and polished	ditto	0	1	4	
Ditto ditto cast	ditto	0	1	11	

		£	s.	d.
Gardiner's patent self-closing, all brass—				
No. 4 0 small	each	0	1	5
401 medium ditto ditto	ditto	0	1	9
402 large ditto ditto	ditto	0	2	0
Walker's patent with china or brass knob	ditto	0	0	11
Ditto all brass and strong	ditto	0	1	12
3in. ditto ditto reeded knob	ditto	0	1	8
Ditto ditto extra strong	ditto	0	2	1
2 1/2 in. Hodge's lock fastener	ditto	0	1	5
2 1/2 ditto ditto	ditto	0	1	7
2 1/2 ditto ditto	ditto	0	1	8 1/2
2 1/2 Biggs and Pardoe's channel wedge	ditto	0	0	11
3 ditto ditto strong	ditto	0	1	5
Patent screw fastener, all brass, machine made	ditto	0	1	0
Ditto ditto cast ditto	ditto	0	1	4
Ditto ditto ditto polished and lacquered	ditto	0	1	7
2 1/2 in. Cross's patent stamped brass	ditto	0	1	1
3 ditto ditto cast	ditto	0	1	5
3 ditto ditto best	ditto	0	1	8
2 3/4 Faulkner's double-action self locking	ditto	0	2	2
3 ditto ditto ditto	ditto	0	2	4
3 1/2 ditto ditto ditto	ditto	0	2	7
China knob extra	ditto	0	0	2
2 1/2 in. Burstow's patent ditto	ditto	0	2	1
3 ditto ditto ditto	ditto	0	2	9
Ditto Copping's, Pantom	ditto	0	2	6
2 1/2 in. Dyke's patent ditto	ditto	0	1	4
3 ditto ditto ditto	ditto	0	1	9
Binder patent, stamped, machine-made	ditto	0	0	11
Ditto ditto strong cast	ditto	0	1	0
Ditto ditto pin joint	ditto	0	1	1
Ditto ditto extra strong	ditto	0	1	7
2 1/2 in. Hopkinson's, all brass	ditto	0	1	10
3 ditto ditto	ditto	0	1	0
3 1/2 ditto ditto	ditto	0	1	3
3 1/2 ditto with china knob	ditto	0	1	0
3 ditto ditto	ditto	0	1	4
3 ditto ditto	ditto	0	1	6
3 ditto ditto best	ditto	0	1	6
3 ditto ditto ditto	ditto	0	1	8 1/2
3 ditto ditto ditto	ditto	0	1	10 1/2
Holland's patent sash-fastener stop	ditto	0	0	6
2 1/2 in. ditto, combined sash fasteners and window protector	ditto	0	1	1
Ditto dead finish	ditto	0	1	3
3 ditto polished	ditto	0	1	11
2 1/2 in. Waycott's patent	ditto	0	1	1
3 ditto ditto	ditto	0	1	2
3 ditto ditto	ditto	0	1	7
Tonks' automatic sash-fastener, with cords and handles	per set	0	8	0
Ditto, sash opener and fastener, with cords and handles	ditto	0	18	6
2 1/2 in. Burstow's patent	ditto	0	2	0
3 ditto ditto	ditto	0	3	0
Nettlefold's ditto	ditto	0	2	2
Adams's Triumph iron fastener, 1 1/2 in.	ditto	0	1	5
2 in. ditto ditto	ditto	0	1	6
3 ditto ditto	ditto	0	1	7
3 ditto ditto	ditto	0	1	8
1 1/2 in. brass ditto	ditto	0	2	6
2 ditto ditto	ditto	0	2	9
3 ditto ditto	ditto	0	2	11
3 ditto ditto	ditto	0	3	1

FANLIGHT CATCHES AND OPENERS, &c., fixed—

Plain brass on plate	each	0	1	2
Ditto large	ditto	0	1	6
Ditto for lights to open outwards	ditto	6	1	8
Ditto to open with line	ditto	0	2	6
No. 699, barrel ditto	ditto	0	1	5
No. 700, ditto strong	ditto	0	1	10
No. 700a, extra strong	ditto	0	3	2
Ditto mortise	ditto	0	2	4
Auger's fanlight openers, iron	ditto	0	3	0
Ditto ditto brass	ditto	0	4	0
Oamaston's ditto	ditto	0	2	9
Arms to stop fans	ditto	0	0	4
Ditto strong wrought-iron	ditto	0	2	9
Ditto in malleable iron	ditto	0	2	0
Silens (Leggott) malleable iron for skylights	ditto	0	5	6
Ditto brass	ditto	0	11	0
No. 5 ditto malleable iron	ditto	0	8	6
5 ditto brass ditto	ditto	0	14	0
7 ditto malleable iron	ditto	0	13	6
7 ditto brass ditto	ditto	0	1	5
(Cords and hooks extra.)				
No. 2 malleable iron for fanlight	ditto	0	5	6
2 brass ditto	ditto	0	9	6
6 malleable iron ditto	ditto	0	7	6
6 brass ditto	ditto	0	13	0
8 malleable iron ditto	ditto	0	14	0
8 brass ditto	ditto	0	1	3
Beauland's patent quadrant to work with window hook, for windows up to 16in. high, 12in. bronzed iron	ditto	0	2	0
18in. to 30in. high = 16in.	ditto	0	2	9
33in. to 40in. = 18in.	ditto	0	3	2
Larger sizes = 25in.	ditto	0	3	6
12in. polished brass	ditto	0	5	0
18 ditto ditto	ditto	0	6	6
18 ditto ditto	ditto	0	7	2
25 ditto ditto	ditto	0	7	9
No. 9052 ditto to work with cords, 12in. bronzed iron	ditto	0	2	3
16in. ditto ditto	ditto	0	2	10
18 ditto ditto	ditto	0	3	2
25 ditto ditto	ditto	0	3	5
12in. polished brass	ditto	0	6	6
16 ditto ditto	ditto	0	7	3
18 ditto ditto	ditto	0	7	10
25 ditto ditto	ditto	0	8	6
Hill's patent fanlight opener for lights, opening on brass screws and iron fittings; length of screw, 15in.	ditto	0	9	6
18in. ditto ditto	ditto	0	10	6
24 ditto ditto	ditto	0	12	9
16 ditto and brass fittings	ditto	0	13	6
18 ditto ditto	ditto	0	16	0
24 ditto ditto	ditto	0	18	0
36 ditto for opening out	ditto	0	10	6
18 ditto ditto	ditto	0	11	9
24 ditto ditto	ditto	0	13	6
16 ditto and brass fittings	ditto	0	14	6
18 ditto ditto ditto	ditto	0	16	6
24 ditto ditto ditto	ditto	0	19	0

15in. skylight opener, brass screws and iron fittings	each	0	12	0
18 ditto ditto	ditto	0	13	0
24 ditto ditto	ditto	0	15	6
15 ditto and brass fittings	ditto	0	18	0
18 ditto ditto	ditto	0	1	0
24 ditto ditto	ditto	0	1	3
Eisley's balance levers to open one sash	ditto	1	1	0
Ditto to open two sashes	ditto	1	1	6
Ditto ditto three ditto	ditto	1	15	0
Ditto ditto four ditto	ditto	2	4	0
Each additional lever for lantern lights and fixing	ditto	0	7	0
Where the rod exceeds 8ft. 6in. or cranked for window in roof, there is an extra charge				
Eisley's to open one sash, gun-metal and iron fittings	ditto	1	13	6
Ditto ditto two sashes	ditto	2	2	0
Ditto ditto three ditto	ditto	2	10	0
Ditto ditto four ditto	ditto	2	17	0

LEACH AND CLARK'S Eclipse Sunlight Opener—

No. 1 for lights 20in to 27in. square, cord action (iron)	ditto	0	7	0
Ditto double for two lights and cord action	ditto	0	9	0
Ditto with rod gear 5ft. long	ditto	0	15	6
Ditto ditto double	ditto	0	17	0
All as first, but brass	ditto	0	10	6
Ditto double ditto	ditto	0	13	6
Ditto double ditto	ditto	1	2	0
All as first, but gunmetal	ditto	0	12	0
Ditto double	ditto	0	18	0
Ditto rod-gear	ditto	0	11	0
Ditto double	ditto	0	17	6
Carlton Taylor's secure fanlight opener of malleable iron, to open either way	ditto	0	6	6
Ditto ditto in brass	ditto	0	12	0
Adams's fanlight opener in plain iron, with brass regulators	ditto	0	18	6
Ditto stronger ditto	ditto	1	1	6
No. 61 ditto ditto	ditto	1	2	6
No. 84 ditto ditto	ditto	1	5	6
Add for nickel-plated rods over 6ft. high	ditto	0	2	0
For fan-lights on centres, 4s. less than the above prices.				
When the rods are more than 6ft. long for plated, add extra	ditto	0	2	0
Ditto plain iron	ditto	0	1	0
Meakin's fanlight apparatus with lines and handles complete	ditto	1	13	0
Ditto for smaller fanlights, or when hung on centres, per set complete	ditto	1	1	0
Long arm hooks and fitting on	ditto	0	0	11
Ditto strong ditto	ditto	0	1	4
Japanned plates to take hook	ditto	0	0	3
Brass ditto	ditto	0	0	6
Ditto ditto strong	ditto	0	0	7 1/2
3in. brass flush rings and letting in	ditto	0	0	5 1/2
1 ditto ditto ditto	ditto	0	0	6
1 1/2 ditto ditto ditto	ditto	0	0	7
1 1/2 ditto ditto ditto	ditto	0	0	9 1/2
Japanned ditto (plate 3 by 2 1/2)	ditto	0	0	5
3 1/2 by 2 1/2 ditto	ditto	0	0	6 1/2
3 1/2 by 2 1/2 ditto	ditto	0	0	8 1/2
4 1/2 by 3 1/2 ditto	ditto	0	0	11
2 1/2 in. japanned iron shutter rings	ditto	0	0	6
3 1/2 ditto ditto	ditto	0	0	6 1/2
2 1/2 ditto ditto	ditto	0	0	7
4 ditto ditto	ditto	0	0	10
2 1/2 in. brass ditto	ditto	0	0	7
2 1/2 ditto ditto	ditto	0	0	7 1/2
2 1/2 ditto ditto	ditto	0	0	8
3 ditto ditto	ditto	0	0	9

THE ARCHITECTURE OF SHAKESPEARE.

A PAPER on this subject was read before the Victorian Architectural and Engineering Association at Melbourne on the 25th July last by Mr. James Green, well known to our older readers as a frequent correspondent to this journal under the *nom de plume* of "De Libra." Mr. Green may be regarded as specially qualified to deal with the subject as the managing editor of the *Australasian Builders' and Contractors' News*, and as having been for seventeen years president of the Ormond Shakespearian Society of London. While the marvellous and many-sided genius of Shakespeare had been, the lecturer observed, a perpetual theme of comment for many years, so far as he knew, the Architecture of Shakespeare was still a virgin field to the literary explorer, and had as yet received the attentions of neither the architectural nor the Shakespearian student. This might be due, possibly, to the fact that in the poet's actual text allusions to architectural features and building operations, unlike his plentiful allusions to flowers and trees and legal processes, were comparatively rare. Yet when we did meet with them, how exquisitely beautiful they were! The description of Imogen's superbly-decorated bed-chamber, as given by Iachimo to Leonatus in "Cymbeline," was quoted as an instance which might be taken by William Morris, Walter Crane, or Andrew Wells as a source of inspiration for a truly æsthetic specification and design. Though we found comparatively few architectural and building expressions in Shakespeare's text, the architectural settings of his scenes, their wonderful variety and their remarkable appropriateness,

not only to the subject of the play, but to the particular episode of it under treatment and to the principal poetic truth to be insisted on, formed no small portion of the never-ending charm with which the poet's works abounded. No dramatic poet that had ever lived could approach our own great dramatist in the amazing richness of architectural location in which he had laid the action of his dramas. Shakespeare's practical acquaintance with the art, as well as with the profession, of architecture was clearly shown in many of his works, notably in Lord Bardolph's well-known counsel of worldly wisdom in the affairs of state, according to the practice of the builder-architect, as given in "King Henry IV." Act 1, scene ii., and commencing:—

"When we mean to build,
We first survey the plot, then draw the model;
And when we see the figure of the house,
Then must we rate the cost of the erection."

Were ever the philosophy and common sense of building operations couched in more graceful and poetic language, and yet withal in more entirely practical plain English, than in these and the sixteen following lines of blank verse? Sparing as the architectural and building allusions were, we nevertheless found them employed for the purposes of both historic illustration and poetic simile, as well as for the requirements of the play. Instances in point were culled from "Richard II.," and a dozen other plays, suggesting how strongly Shakespeare was imbued with the love and appreciation of architecture. Mr. Green proceeded to point out how categorically and appropriately the various countries, cities, towns, and individual buildings in which the action of the play was laid were specified. So distinctly indeed had this in very many instances been done, that from the dates of the incidents (when these were historical, or of the characters or types of incident when they were fictitious), the exact location of the various scenes might be laid down almost as accurately as the matters dealt with in an architect's plans and specification. The lecturer could scarcely conceive a more pleasant relaxation, of a still partially professional character, for a young architect than to take some play of Shakespeare's in which the architecture was especially prominent, study carefully the action, and then make rough sketches and specifications (with details of nationality and period) as could be worked out for the guidance of the scene-painter and stage-carpenter, as though the piece were to be actually produced upon the stage from his designs. The whole of the Shakespearian drama would be found to embrace the architecture of some two thousand one hundred years, and this might be divided into some five chronological groups: 1st, the Prehistoric; 2nd, the Classical, dating from 488 B.C. to A.D. c. 500; 3rd, the Early Medieval, from A.D. c. 1,000 to c. 1,300; 4th, the Consecutive English Historical, from A.D. 1377 to 1485; and 5th, the 16th Century or Contemporary plays. Each of these five classes of plays had, as was shown in detail, a setting of architectural scene of peculiar appropriateness.

CHIPS.

M. Geoffroy de Chaumes, the sculptor, and latterly curator of the Museum of the Trocadéro, which he had done much to bring to its present state of usefulness, died, on Sunday, at the age of 76. He was the sculptor of the marble at the Luxembourg of Béranger on his death-bed.

It is proposed to erect a tablet in Lichfield Cathedral as a permanent record of the services rendered to Staffordshire by the late Earl of Lichfield as Lord-Lieutenant and as chairman of quarter sessions during a long term of years.

The corporation of Folkestone have decided to call in Mr. James Mansergh, C.E., to advise them as to the sewerage of the borough.

The late highway surveyor of Hatfield, Charles James Chapman, has been remanded on a charge of forgery, with intent to defraud the ratepayers of the parish.

The George and Dragon Hotel at Lamberhurst was reopened last week, after having been entirely rebuilt. Mr. L. Beale, of Tunbridge Wells, was the architect, and Mr. Adams, of the same town, the builder.

The Stirling Water Commissioners have resolved to apply to Parliament for powers to construct filters in connection with the waterworks on the Touch Hills, and also to increase their borrowing powers and extend the assessment to owners. Mr. R. M'Luckie, C.E., Stirling, has been appointed engineer for the new works, which are expected to cost between £6,000 and £8,000.

CONTENTS.

The Architecture of Angles	367
The Sanitary Condition of Our Towns	367
Theatres.—VI.	368
A Sanitary Crusade through the East and Australasia. 310	
The Guildhall	312
Prices.—XLIV.	313
The Architecture of Shakespeare	314
The Building News Directory	XIII.
Our Illustrations	315
Competitions	315
Wayside Notes	334
Fireproof Construction in New York	334
Obituary	334
The "Wywy" Hygienic Stove	335
Bricks and Joints in Brickwork	335
Rapid Building in Chicago	335
Building Intelligence	336
Architectural and Archaeological Societies	336
Engineering Notes	337
Intercommunication	337
Legal	337
Legal Intelligence	338
Our Office Table	338
Trade News	339
Tenders	339

ILLUSTRATIONS.

CORNISH CONVALESCENT HOME AT PERRANPORTH.—TWO INTERIORS OF A LONDON HOUSE.—WELBURN HALL, KIRBYMOORSIDE.—HOTEL DE VILLE, OUDENARDE.—NEW LADY CHAPEL, ST. PETER'S CHURCH, ROATH, CARDIFF.—FURNITURE FROM THE MAGNIAC COLLECTION.—NEW BOATHOUSE, COOMBE PARK, WHITCHURCH.—MASONIC BUILDINGS, HENLEY-ON-THAMES.

Our Illustrations.

THE CORNWALL CONVALESCENT HOME.

THIS home was built, furnished, and endowed at Perranporth by Mr. J. Passmore Edwards, the proprietor of the BUILDING NEWS, in memory of his mother, who died just twenty-one years ago. When opened about a month since it was handed over to and accepted by the authorities of the Royal Cornwall Infirmary Trust, the principal institute of this kind in Cornwall. Perranporth is a small watering place about nine miles from Truro. It has a magnificent bay, where the foam-crested waves of the Atlantic everlastingly break and fall over golden sands. The home stands on an elevated site overlooking the blueseas, whose musical murmurs may be heard by convalescents. The walls of the building are built of local quarry stone; the dressings of granite and hard-burnt local brick of a light stone colour. The quarry stones for the principal elevations are dressed on the beds and squared, and built in random courses, with the natural face of the stone on the outside; the colour of these is a dark brown of a bluish hue, and affords a pleasing contrast or relief to the granite and brick dressings. On the ground floor the vestibule and lobby are divided by a glass screen filled in with tinted cathedral glass in lead lights. The ground floor comprises reading-room 19ft. by 13ft., day-room 28ft. by 16ft., exclusive of large bay; dining-room 24ft. by 16ft., cloak-room and lavatory 16ft. by 13ft., housekeeper's room 16ft. by 14ft., kitchen 17ft. by 16ft.; also scullery, larder, store-room, and other usual offices. The first-floor plan and attic afford ample accommodation for 24 beds; there are two w.c.'s on this floor, also bath-room, lavatory, linen closets, &c.; the last named are provided with hot-water appliances. There is also one room set apart and furnished as a place of retirement for private devotion. In front and over the centre of the building there is a spacious balcony or lead flat about 28ft. by 16ft. This is provided with a bold and neat railing fixed to a granite plinth or stringcourse nicely wrought, on the face of which are cut the words, Convalescent Home, in bold letters. Internally, all the joiners' work is of red deal and pitch-pine, varnished. The floors of reading-room, day-room, dining-room, housekeeper's room, and cloak-room are of red deal. The vestibule and lobby are laid with encaustic tiles; all other floors are of Portland cement. The interior of the building has a very light appearance throughout, and there is a view of the sea from almost every room in the house. From the balcony and attic the views are very extensive

and magnificent. The home was designed and built by John Simons and Son, Blackwater, Cornwall.

INTERIORS OF ARAB AND DINING ROOM, SEVILLE-STREET, S.W.

THIS dining-room, which was formerly a plain, distempered apartment with grained woodwork, and two sash windows with a pier between them, has been altered into what may be seen by the illustration. A large mullioned window of oak with lead lights has been put at the end of the room, and a high panelled dado and oak mantel with rich leather filling up to the cornice has been fitted round the room. The ceiling has had geometrical ribs added to it, and the beam across the room has been cased in oak, and has carved oak consols at each end. What was formerly a conservatory on the half-landing with ordinary lean-to skylight and side-lights filled with ground glass, has been turned into an Arab lounge. The ceiling has two green glass circular domes in it, and is covered with Japanese paper of an old Arabian design. The sash windows have been taken out and mullioned windows with cusped heads. The screen which divides the divan is filled in with meshrebeyeh work, and the whole of the woodwork is stained dark and picked out in three colours.

WELBURN HALL, KIRBYMOORSIDE.

THIS Elizabethan house, situated in North Yorkshire, is being renovated and considerably enlarged from the designs of Mr. Walter H. Brierley, of the firm of Messrs. Demaine and Brierley, architects, of York. The three plans which we print with the architect's perspective view show the new additions very clearly, the old part being hatched in line. The history of this mansion doubtless includes much of interest, but no other particulars have come to hand. The three floors explain the arrangement of the house.

HOTEL DE VILLE, OUDENARDE.

WE gave on March 10 last the details of the dormers of this building; on July 15 we reproduced the ground-floor arcade from the working drawings of Professor Hillespulle, the architect of the restoration; and we are now indebted to M. Vincent Lenertz for the details of the clock-tower in the centre of the façade.

NEW BOATHOUSE, COOMBE PARK.

THIS little building, erected for Mr. John Foster at Coombe Park, Whitchurch, Oxon, is situated in one of the most picturesque spots on the banks of the river Thames, just above Pangbourne, and consists of an ample dry boathouse, as well as the dock, a summer-house, and tea and dressing-rooms, &c. The work has been very substantially carried out from the designs of Mr. W. Ravenscroft, of Reading, the whole having been executed by the estate workmen.

NEW MASONIC BUILDINGS, HENLEY.

WE illustrate this week a small building recently erected at Henley-on-Thames for the accommodation of the Thames Lodge of Freemasons. The building consists of a hall or lodge-room, with a partly open roof, committee-room, ante-room, lavatory, conveniences, &c., and has been erected from the designs and under the superintendence of Mr. W. Ravenscroft, of Reading, chiefly in brick and stone, by Mr. Weyman, builder, of Henley. It is amply warmed and ventilated, and when funds will allow of the internal decoration it is designed to receive, it should make a very complete and satisfactory building.

PROPOSED LADY CHAPEL AND VESTRIES, ST. PETER'S, ROATH, CARDIFF.

THIS chapel will, when built, accommodate about 100 worshippers, and has been so designed, that with the proposed new vestries the church will have a finished appearance from the west. The walls are to be constructed of local stone, with quoins of Forest stone, and plastered on the inside to the face of freestone dressings. The windows are to have relieving arches of Forest and Bath stones alternating, as in existing structure. The roofs are to be open-timbered and covered with slate. Floors under seats to be boarded with gangways of wood-block, and sanctuary to be laid with tiles. The church was originally designed by the late Charles Hansom, the architect for the proposed new work being Mr.

William Bevan, 18, Castle Chambers, Cardiff, whose designs were selected in competition.

FURNITURE FROM THE MAGNIAC COLLECTION.

THE Cabinet in the centre of these sketches is made in walnut-wood, and is of an exceedingly ornate character. The folding-doors are carved with mounted knights, and round these are borders of arabesques. The drawers above and below are likewise carved with foliated ornamentation. In the centre is a figure of Bacchus, and at each angle is a draped female figure, while masks accentuate these points. The two curious pot-shelves seem to be of later date. The stall-like Chair of French Renaissance work is in carved oak, the entire height being 5ft. 9in., and the width 2ft. 4in.; the panelled back is richly carved, and is a fine example of Early French work. The shafts and mouldings are of a decidedly Gothic character. The Italian Arm-chair is likewise in oak. The carved and shaped rails and baluster work are interestingly treated, and the two heraldic lions make an excellent finish to the two curved arms.

COMPETITIONS.

LLANELLY TOWN HALL.—A special meeting of the local board of Llanelly was held on Wednesday afternoon to receive the report of the assessor, Mr. Charles Barry, F.S.A., F.R.I.B.A., on the 25 sets of competitive plans submitted for the proposed Town Hall. The site is in the People's Park, and the cost is limited to £10,000. Mr. Barry, in his report, stated that he spent two days in examining the designs. Many of them were of good character, both as regards external appearance and, what was more important, as regards suitability for the object in view, evidenced by skilful planning and convenient arrangements of the several rooms and sets of rooms appropriated to the different departments. Having been asked to advise the board which, in his opinion, were the two most satisfactory designs, having regard to the above and the contemplated outlay of £10,000, he awarded the first prize to the designs marked "Motto Equity," and the second to those under the motto "Falcon." The authors of both plans expressed the belief that their designs could be carried out for £10,000.—The members then inspected the two successful plans, after which the clerk opened the letters bearing the titles of the above mottoes, when it was found that the designs marked "Motto Equity" were those of Messrs. Simon and Tweedy, Edinburgh and Manchester; and the designs of "Falcon" proved to be those of Mr. William Griffiths, architect and surveyor, and agent to the Gellywernen Estate, Llanelly. It was then decided to send the first premium of fifty guineas to Messrs. Simon and Tweedy, and the second of twenty guineas to Mr. Griffiths. The former architects' fees for carrying out the work were the usual 5 per cent., but Mr. Griffiths offered to carry it out for 4 per cent. A proposal was made that the plans should be open for the inspection of the public; but an amendment that they should not be exhibited without the consent of the competitors was carried. A discussion followed as to whether the board was bound to accept either of the two prize plans, and the decision was adjourned for a week. The members would thus have an opportunity of comparing the plans, so as to make a selection next Wednesday.

Christ Church, Nessfield, a small hamlet in the parish of Ilkley, was dedicated by the Bishop of Richmond on Thursday, Aug. 25th. The building is Early English in style, and seats 120 persons.

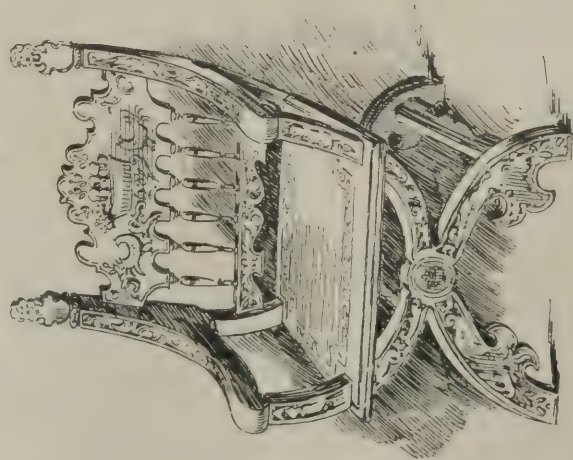
The Horncastle Rural Sanitary Authority have approved a scheme for the sewerage of Woodhall Spa, prepared by Mr. Herbert Walker, A.M.Inst.C.E., of Nottingham. The present sewers will be utilised for storm water, and the sewage will be removed by the "Shone" hydro-pneumatic system.

The latest addition to the pictures in the National Gallery is a small genre work, entitled "The Rat-catcher," by Thomas Woodward, 1801-52. It was bequeathed by Mr. Edward Archer, is numbered 1379, and is hung in room XIX.

From a correspondence which has appeared in the *Sheffield Telegraph*, it seems that the first brick house built in Sheffield was erected in Pepper-alley (now Norfolk-row) in 1696. It was ridiculed by the inhabitants, who, accustomed to stone buildings, thought one erected of such perishable materials must soon yield to decay. It was occupied in good repair in 1833, and was pulled down in 1836.

FURNITURE. FROM THE MAGNIAC COLLECTION.

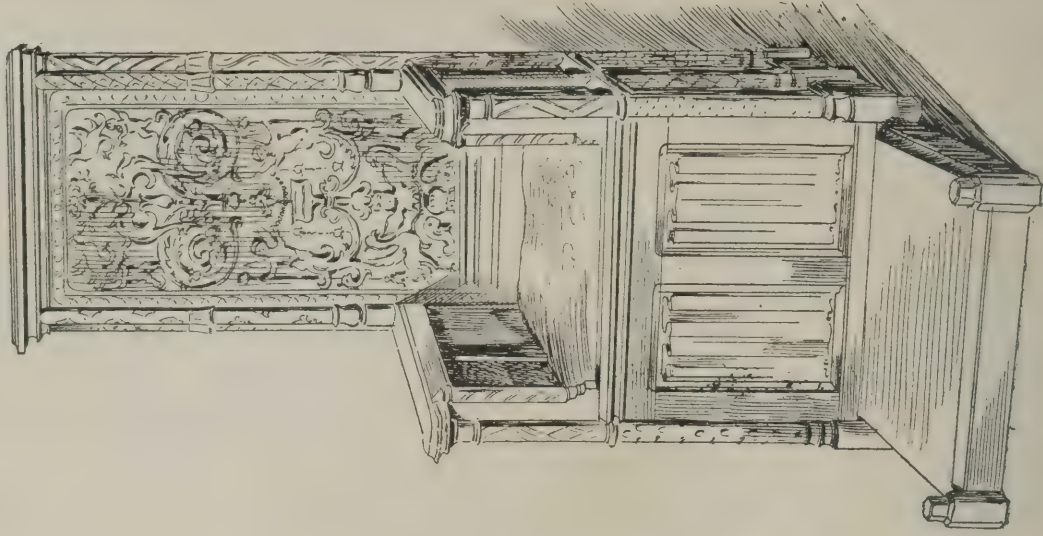
SKETCHES FROM CHRISTIES.



ITALIAN ARM-CHAIR



16TH CENTURY CABINET.



FRENCH RENAISSANCE CHAIR.

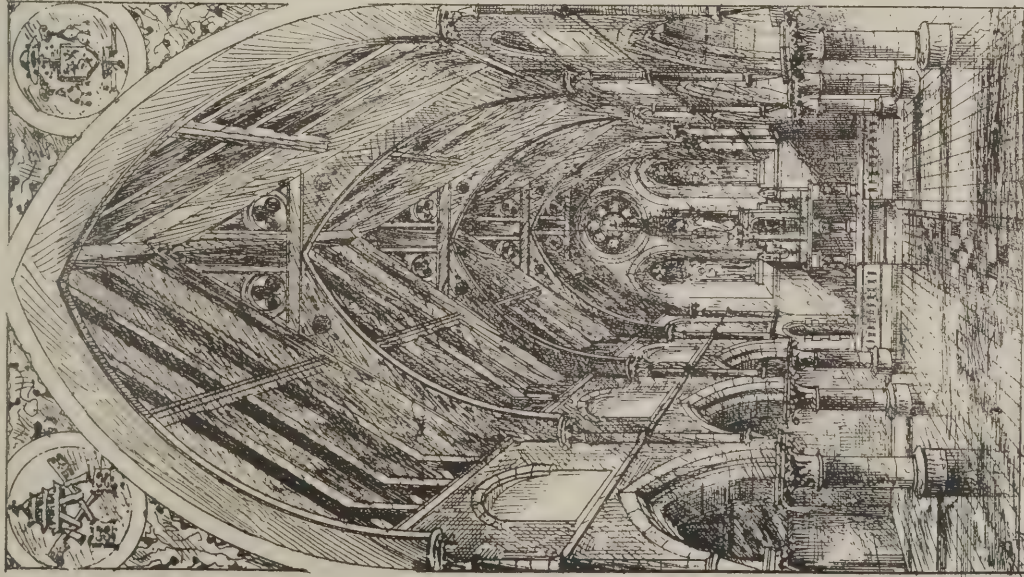


Fig. 26. Interior View of St. Peter's Roath Chapel.

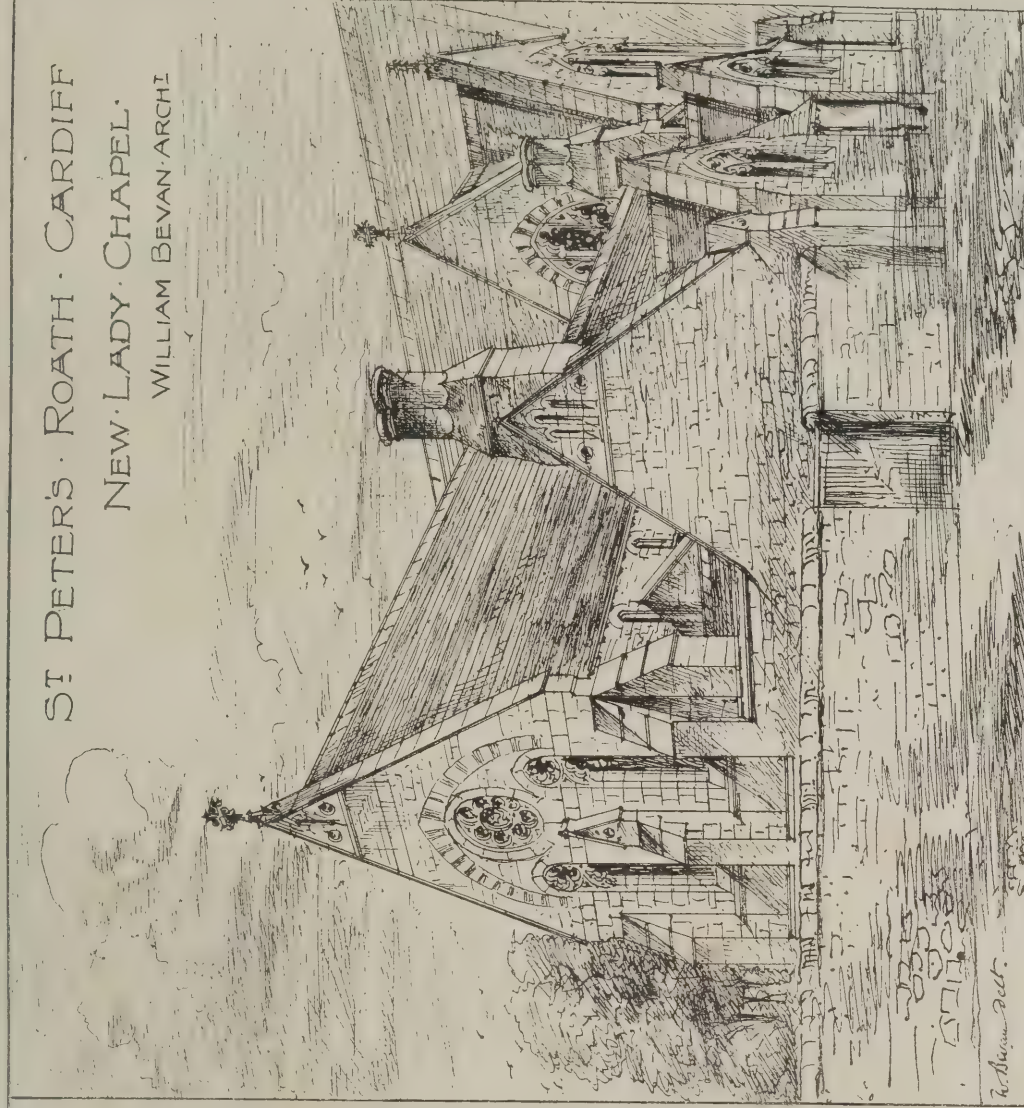


Fig. 27. Exterior View of St. Peter's Roath Chapel.

ST PETER'S ROATH · CARDIFF
NEW · LADY · CHAPEL ·
WILLIAM BEVAN · ARCHT

WAYSIDE NOTES.

ANOTHER meeting of the shareholders of the Manchester Ship Canal Company having been held, we are put in possession of up-to-date facts in regard to this undertaking. Lord Egerton, as chairman of the Board of Directors, has stated that he has never less despaired of the future of the Ship Canal than at the present time; nevertheless, on his lordship's own confession, he had again to tell the shareholders "some unpleasant truths." The latter apparently related to the excessive discrepancies between the estimates and actual cost of executed works, a great part of the address to the shareholders being, indeed, composed of apologies on this score. As to the actual progress of the works, we are told that they are now approaching completion. An approach of considerable lengthiness, one thinks, remembering how we have been told that the Canal would be opened this year. The date now assigned is the end of 1893. The statement as to the works approaching completion has to be taken in connection with the little reserve "except on the site of the existing railways and the estuary portion of the docks." The Salford Docks are being completed, and lines of railway to run down to these docks being laid, while certain wooden jetties have been erected. Additional dredging beyond that anticipated has caused much extra work and expenditure of capital. Much trouble has been caused by the opposition of railways and owners of land and works, and by the opposition of the Liverpool Dock Board, by rotten banks and heavy floods. Good building stone had been calculated upon as a find in the excavations for the canal and docks, but much of this has proved useless for building purposes, so that other stone has had to be purchased. There are evidently many troubles with which the engineers and directors of this scheme have had to cope, as is the case in all ship canal undertakings. It will, however, be a relief to hear that the canal is ready for opening, and interesting to watch the practical working of the scheme.

Respecting the canal, "Disgusted" writes to the *Standard* the same day as the report of the Company's meeting appears: "I recently visited that part of the Manchester Ship Canal which lies between Salford and the great swing-bridge of the Bridgewater Canal, and found a state of things which, in the event of an outbreak of cholera, will constitute a great danger to the entire surrounding district. The whole of this section of the canal was filled with a black mass of putrid sewage." The correspondent goes on to unsavoury details quite unnecessary to repeat here; his description of the section of the canal as a mass of sewage is sufficient to show that things are not managed as they should be, and that local residents have a just grievance.

Advices more cheerful than the general news of to-day come from Hamburg. According to the American Consul, the great North Sea and Baltic Ship Canal is likely to be finished and open for traffic early in 1895. It is said that the British Consul at Stettin, in a recent report, expresses doubt whether our own east-coast ports will benefit much from the new waterway, but general traders between the Baltic and the British Isles should find the canal useful. Baltic fir should become a bit cheaper, if possible, after the opening of the canal. A great distance of sea voyage would be saved round Denmark. Naturally enough, the Danes are said to look with disfavour on the canal, as the transit trade at Copenhagen must be injured. According to the American Consul at Hamburg, 7,000 men are constantly employed on the works, to the cost of which the Russian Government has paid £2,500,000 sterling, the balance of £7,800,000 being found by Germany.

A church at Bergen, in Norway, I read, is built entirely of paper compressed by powerful machinery, and rendered waterproof by a solution one of the principal constituents of which is lime. There would seem to be a future before paper as a constructive material. We hear of paper wheels for railway carriages, and have long had our moulded-paper ceiling decorations. Now we are told of a paper church, and may yet hear of a Paper style of architecture.

¶ The inhabitants of Richmond have been exceedingly fortunate in the matter of their new

water supply. It was reported early in the week that an important fissure, yielding a good supply of water, has just been struck in the adit now in course of construction between the two wells recently sunk, and the news has rejoiced the hearts of the ratepayers, the new fissure being of immense value in saving the borough some of the money which is paid to the Southwark and Vauxhall Company, who charge 1s. per 1,000 gallons. The amount expected daily from the new source is about 50,000 gallons, and the water, we imagine, will be purer than that supplied from the Southwark and Vauxhall Company's mains.

Of course, at this present juncture people are awakened to the fact that they turn their sewage into the Thames and draw their drinking supplies from the same river. Those who have always seen the folly of the arrangement may regret that a year of epidemic diseases should find no reform in this matter; but to complain now, with reference to present supply, is extremely idle. It is a case of Hobson's choice—that or none. Letters may flood the papers, as they are doing; but this will not make the water any purer. Possibly the present scare may render the inhabitants of London more keenly alive to the dangers of a contaminated water supply such as a vast proportion of the whole population has to put up with, and thus desirable reforms be brought nearer. "M. D." writes to the *Times* and asks who is to protect the consumer against contaminated water? The question may well be asked, but how answerable is another matter. Most probably the consumer himself will have to form his own body-guard, and boil his water if he does not like the article in its raw and crude state. Here is always a remedy.

An interesting blue book for engineers is the Board of Trade report on railway accidents and casualties, issued on Tuesday last. It gives a classified list of accidents, together with detailed accounts of their causes. One needs to look at matters in all lights before jumping to conclusions, or the statistics will be found misleading. Thus we read that of the rails that broke six were of iron and 82 of steel, which looks strange until it be remembered that iron rails are now little used, steel being the material employed, to, I believe, the almost total exclusion of iron. Altogether the whole number of accidents and mishaps amounts to something considerable; but, when the extent of the railway industry is taken into account, it is very insignificant. Statistics have before now been shown to prove that in a railway carriage where one is being cared for the whole time one is in reality very secure from dangers of any sort. Lately there have been very many accidents, but year by year, owing chiefly to the increased use of automatic and continuous brakes, there is a marked improvement.

GORN.

FIREPROOF CONSTRUCTION IN NEW YORK.

SEVERAL very necessary regulations are now in operation in New York under the new Act to insure fireproof construction. Every building to be used as an hotel, theatre, hospital, school, &c., the height of which exceeds 35ft., and every other building the height of which exceeds 85ft., is to be built fireproof, or have walls of brick, stone, iron, or other hard, incombustible materials, in which wooden beams or lintels shall not be placed, and in which the floors and roofs shall be of material similar to the walls. The stairs and staircase landings are to be built entirely of brick, stone, iron, or other incombustible material. No woodwork or other inflammable material is to be used in any of the partitions, furrings, or ceilings in any such building except that for doors and windows and their frames; the casings, the interior finish when filled solid at the back with fireproof material, and the floor-boards and sleepers may be of wood. All cast-iron, wrought-iron, or rolled steel columns are to be made true and smooth at both ends, and are to rest on iron or steel bed-plates, and have iron or steel cap-plates, which shall also be made true. All iron girders, columns, beams, trusses, and ironwork of all floors and roofs shall be strapped, bolted, anchored, and connected together and to the walls in a strong and substantial manner. Other regulations are laid down respecting the framing of beams into

headers, the bolts, angles, knees, &c. Wrought-iron or rolled-steel beams, 8in. deep and under, are to have bearings equal to their depth if resting on a wall; 9in. to 12in. beams shall have a bearing of 10in., and those beams of more than 12in. deep are to have bearings not less than 12in. if resting on a wall. Where beams rest on iron supports and are tied to the same, no greater bearings are required than one-third of the depth of the beams. Iron or steel floor-beams are to be so arranged as to spacing and length of beam that the load to be supported, together with the weights of the materials used, is not to cause a deflection of the said beams of more than $\frac{1}{8}$ in. per lineal foot of span, and they are to be tied together at intervals of not more than eight times the depth of the beam. All brick and stone arches placed between iron or steel floor-beams shall be at least 4in. thick, and have a rise of at least 1 $\frac{1}{2}$ in. to each foot of span. Other regulations as to wider arches and their construction, the incasing of bottom flanges of girders with hard, burnt clay or porous terracotta or wire lath, as to iron and steel lintels and their bearings, follow.

OBITUARY.

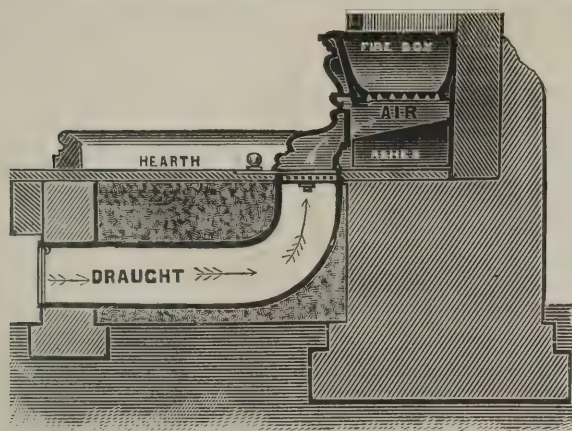
MR. J. W. GROVER, M.Inst.C.E., F.S.A., of Westminster and Clapham Common, died on the 26th ult., aged 56, after a long and painful illness. He was a pupil of the late Sir Charles Fox, and was first employed on the surveys of the Great Northern of Portugal Railway under Sir John (then Mr.) Fowler. He was employed for several years under the Science and Art Department, and assisted in various surveys and constructional works, amongst others the great roof of the Royal Albert Hall, the museums, and the Horticultural Society's buildings. He went to Venezuela in 1873, and laid out the mountain railway from La Guayra to Caracas; he also prepared the hydrographical surveys of the coast of Venezuela, which led to the construction of the harbour of La Guayra, and the lighthouse of Los Rogues. Mr. Grover acted for several Welsh railway companies, and carried out the Hemel Hempstead and Midland and the Westerham Valley branch lines. He designed the Kingsland iron bridge, of 200ft. span, over the Severn. During the last twenty years Mr. Grover had been largely engaged in waterworks, including those at Bridgend, South Wales; Westerham, in Kent; Newbury and Speenhamland, Berks; Wokingham, Bracknell, and adjacent parishes in Berks; Leatherhead, Cobham, Ashted, and adjacent district; and Rickmansworth and the Uxbridge Valley. He also visited the West Indies to report on the surveys for an extensive water supply, and he had been employed on similar works in Egypt, Austria, Denmark, Italy, and Switzerland. In 1886 he rediscovered in a vault under St. Paul's Church, Wandsworth-road, Clapham, the Bowyer marble monuments, and had them re-erected in that church.

Mr. William Forbes Skene, LL.D., D.C.L., the well-known archaeologist and genealogist, died on Monday at his residence in Edinburgh at the ripe age of 83 years. The chief works are "The Highlanders of Scotland" and "Celtic Scotland." On the death of Dr. John Hill Burton in 1881, Mr. Skene was appointed Her Majesty's Historiographer for Scotland, which, with the exception of the office of Her Majesty's Linner, is the last remaining relic of the Royal Household of Scotland. In 1888 a number of Mr. Skene's friends and admirers commissioned Sir George Reid, P.R.S.A., to paint his portrait, to be kept by Mr. Skene during his lifetime, and at his death to be transferred to the National Portrait Gallery.

Mr. James Stocker, of St. Thomas, Exeter, died on the 23rd August, at the advanced age of 87 years. Mr. Stocker long carried on the business of a builder in that city, in later years in conjunction with his elder son, Mr. John Stocker, the chairman of the St. Thomas School Board.

The local board of Castleford have instructed Mr. A. Hartley to prepare plans for swimming-baths at a cost not to exceed £1,000.

A museum for Ilkley was opened on Thursday in last week by an address from the Rev. Dr. Collyer. A disused Wesleyan chapel in Skipton-road has been fitted up with shelves and cases, the nucleus of the collection being formed by altars, gravestones, effigies, querns, cinerary urns, pottery, and other relics of the Roman occupation found in the town itself.



THE "WYWY" HYGIENIC STOVE.

THE Ashton and Green Iron Co., of Bury-street, St. Mary Axe, E.C., have introduced a new stove patented by Mr. E. Wright, which, from our inspection of it, appears to possess many indisputable advantages, amongst them, that it is smokeless, burns coke and anthracite coal, or any rubbish, producing a brilliant fire in five minutes, that it gives out double the heat with less fuel than any other stove, overcomes a sluggish or down draught, prevents draughts from doors and windows, is perfect in combustion, requires no attention, and is quite clean, the fuel being reduced to ashes, &c. These advantages have been confirmed by several gentlemen who have used the stove, including Dr. H. Osborne Grenfell, of Southend. The patent "wywy" stove, illustrated by the section we give, has an independent fresh-air channel, which can be brought direct from the outer air between the joists and turned inwards under the hearth to the underside of the fire-basket, thus supplying all the air to the stove required for combustion, at the same time avoiding all draughts from the room. On the ground floor the channel may be made to end under the first joist next the hearth, the current in this case being supplied through the air bricks, while on any upper floor the duct can be carried between the hearth and ceiling, and be made to extract the vitiated air of the room below, a pipe being taken between two joists to the outer wall. The fresh air is introduced by a grating immediately in front of the ash-pan, and between it and the fire-bars of fire-box as shown. We observe that the fire-basket is shallow, specially shaped, and has a solid front, so that the air is obliged to pass through the bottom of the fuel. The basket, as well as the ash-pan, can be readily taken out for cleaning. Nothing can be simpler than this arrangement. In front of the fire-basket is an ornamental cast front, easily removed. The inlet of channel can be regulated by a ventilator, thus controlling the air supply. On the ground floor a hot-air chamber or oven can be formed below the hearth and stove, thus making a capital cooking oven. The "wywy" can be fitted into a wooden chimney-piece with a loose canopy and a "Teale" shaped solid firebrick back. The stove we saw was fitted with tiles, in the cheeks, had a sloped firebrick back, and nothing can be neater in appearance. The stove can be fitted to the simplest or the most elaborate front, and its artistic treatment is certainly more satisfactory than that of the ordinary stove. We have not the slightest doubt that this new stove will be generally used when it is once known, for its perfect cleanliness, greater heat, and economy. The cost of the stove is within the reach of all.

BRICKS AND JOINTS IN BRICKWORK.

THERE is no constituent part of a building about which so much might be written as of a brick; and what is of greater importance from a practical point of view, there is no part less susceptible to disintegrating atmospheric and other influences, and therefore so durable as a well-burnt brick, an example of which—if we may adduce one so far-fetched—is that of Hillah, a modern settlement on the west bank of the Euphrates, built, as we are informed by a paper on "Recent Assyrian Research," read before the Philosophical Society of Great Britain, of

the excavated bricks and terracottas which have been thrown up in the comparatively recent explorations of the ruins of Babylon, situate on the opposite side of the river. But we are not wanting in examples nearer home—

"Those brickly towers
Where now the studious lawyers have their bowers,
Where whilome wont the Templar Knights to bide,
Till they decayed through pride."

And, later still, the 16th century or Tudor brickwork of Hampton Court Palace, with its well-proportioned niche heads of elliptical plan and semicircular elevation; the Layer Marney Tower and churches of Essex, and the Gray's Inn Hall, Holborn, lately denuded in part of its coat of daub or stucco, revealing the warm deep—and in some portions brindled—colour of 16th-century bricks, most probably produced by the fierce heat of wood-burning, and which are likely to outlast the bricks of more modern manufacture employed in the restoration of the exterior wall facings.

These remarks apply more particularly to the north-west portion of the building on either side of the archway approached from Gray's Inn, not the least pleasing feature of the old facing-bricks of which was their uniformity of size and shape, with a regular thickness of bed and cross joints, for which we look in vain on many of our buildings of more modern erection. The "closures" or quarter-bricks in the heading-course next the window reveals bear evidence, by their regularity of size, of having been cut to a gauge for the purpose of keeping the perpend in the heading courses. This was a sample of the work done when the general contractor or *quondam* builder's clerk did not obtain. The face-joints as originally struck and trowel-cut are unfortunately lost, as they had been hacked to form a key for the stucco coating, now removed, and what remained of the old face-joints was therefore necessarily hacked out, and has been reformed by that *shoddy* process known in the trade as "pointing."

The writer would here appeal to all architects, in the interest of good work and the production of skilled workmanship, to insist on the face brickwork being trowel-struck and cut during the erection of the work, except in winter months, when sharp frosts are likely to occur, when the joints should be raked out at least $\frac{3}{4}$ in. deep, and square with the face, laying bare the edges of the bricks in the full depth of the raking out.

The subjoined are some of the reasons for advocating the striking and cutting of the joints during the erection of the building: Good mortar must be used for laying the face bricks, or a good joint cannot be produced. The face bricks must be wetted before laying them during the dry months, or the moisture will be taken up from the mortar by the dry bricks to such a degree as to make it impossible to properly strike the joint. The face bricks cannot be tampered with by colour or copperas, and are, therefore, likely to be of a better class than for work intended for pointing.

The joints are more durable, as they form one body with the mortar of the wall, instead of a veneering, as in the case of pointing. The joints, if properly trowel-struck and cut, exclude the weather more effectually than if pointed, for the reason that the top and bottom edges in pointing are cut off with a "Frenchman" (*i.e.*, a table-knife filed to a point and turned up at

the end). This tool often cuts into the mortar joint, leaving ragged edges and lodgments for the weather, instead of a full joint, with clean-cut top edge, ironed to a degree of smoothness by contact with the underside of the brick trowel in its passage along the joint in the act of cutting off the top edge. A building in which the joints are struck and cut during erection always attracts a better class of workmen than a building carried up *rough* for pointing, the building thereby benefitting by the employment of additionally skilled workmen.

There is no class of work in the trade upon which the skilled bricklayer prides himself so much as upon the finish of his trowel-struck and cut joint, and though it may seem incredible to the uninitiated, there are numbers of men who have followed for years the calling of the bricklayer who are unable to strike and cut a joint possessed of the distinguishing characteristics of first-class work.

There are some examples of good brickwork in London which might with safety be cited in specifications as the standard and quality of work required. A plan which recommends itself is to build a sample piece of face brickwork in the early stages of the job, as a standard of work below which the contractor shall not go—a practice very largely followed by engineers, and not confined to brickwork only.

Though the practical bricklayer will in nearly every instance declare in favour of the flat struck joint because of the facility it affords him of hiding some of the inherent and acquired defects of the bricks (defects of shape, and of damage by transit), yet there is much to be said in recommendation of the weathered joint now in vogue; and in two pieces of work executed at the same time, all conditions being equal, there is no doubt but that the weathered joint would be found the more durable of the two, on account of its sheltered position with respect to the face of the building. The top edge of the weathered joint should be struck well back—not less than $\frac{1}{4}$ in.—and the bottom ragged edge removed, the joint *slightly* overlapping the top edge of the course below. If the joint is cut *above* the top edge of the course below, the joint is likely to form an arrestment for the weather, and defeat the object of the weathered joint. Where this form of joint is used, it should be borne in mind that a large proportion of our bricks ordinarily used for facings are not only pervious to moisture, but are active inductors of it, by reason of their porous structure and consequent capillary attractiveness. With bricks of this kind the weathered joint is of little or no use, for the rain, though falling free of the mortar joint in its passage down the wall, will be imbibed by the brick courses between joint and joint, until the wall be well charged with moisture. In weathered-struck joint intended to be first-class work, the bricks should be sorted out to a regular thickness by trying each brick to a gauge. The necessity of this arises from the fact that the top edges of the bricks when building are laid or adjusted to the level of the brick-line, drawn from end to end of the wall, and any difference in the thickness of the bricks are, therefore, unavoidably driven into the mortar bed-joint of the course below, and is made very apparent by striking or weathering the upper portion of the joint from $\frac{1}{4}$ in. to $\frac{3}{4}$ in. back from the face of the wall. The flat-struck joint, from its comparatively exposed position, is susceptible to injury, and to apparent obliteration by sooty deposits in our large manufacturing towns, losing the interest and units of measurement, which the joints, more than anything else, impart to a piece of work; while the weathered joints, with their play of light and shade, always remain distinctive features, or indices of construction.

(To be continued.)

RAPID BUILDING IN CHICAGO.

THE British Consul at Chicago in his latest report gives an example of the extraordinary rapidity with which lofty buildings are erected there. The Ashland block, a construction of steel, stone, and terracotta at the corner of Randolph and Clark streets, close to the city hall, 17 stories in height, was built on an area of 140ft. by 180ft. in midwinter, and work was continued, day and night, by relays of men, strong arc electric lights being used by night; artificial heat was furnished by 100 salamander

stores to enable the builders and masons to work at that season of the year, and protection from cold winds was given by several hundred yards of thick canvas. The skeleton of steel for each floor was first erected, each column, girder, and rafter being lifted and placed in position by steam power; these were riveted with red-hot rivets, and as the stories rose they were filled in with square blocks of terracotta and brick. On December 6 last year six floors were completed, and the steel skeleton for the next six stories was for the most part placed. On December 19 ten floors were completed, and the steel shell for three more stories was mostly in position. Thus the entire construction of four floors of a building 140ft. by 80ft., divided into numerous rooms, was solidly built in 12 days, or one floor in three-and-a-quarter days. About 60 iron and steel workers, 100 brick masons, and 35 terracotta setters were continually at work. The enormous quantity of iron and steel used in this new mode of construction, which was only first tried six years ago, has created quite a new industry, and the *employés* have already their organisation under the term of architectural iron workers. Steel has now almost entirely taken the place of iron, of which the first few of these tall buildings were constructed. The foundations are tiers of steel rails, embedded in concrete, the beams stretching 10ft. or 12ft. under the street. This plan was found necessary on account of the nature of the soil, so as to bear the great imposed weight. These beams are made at the Illinois steel works, or come from Pennsylvania. This new method of building is said to be lighter and stronger than the old system, and to be absolutely fireproof. The greatest variation in the plumb-line from base to top of these tall buildings has been found not to exceed half an inch.

CHIPS.

Lord Balfour of Burleigh, convener of Clackmannan County Council, opened a new iron bridge spanning the Devon at Westhough, on the Alva estate, on Saturday. The bridge is on the lattice girder principle, partly malleable iron and partly steel, the abutments being of stone built on concrete. It has been constructed to bear a weight of 12 tons. The estimated cost is about £1,300. Mr. Lake, county road surveyor, prepared the designs.

On Wednesday week Mr. Arnold Taylor, an Inspector of the Local Government Board, held an inquiry at Ramsgate into an application by the town council to borrow £19,168 for public improvements. The most important item was £13,500 for the purchase and laying out of the Ellington estate as a public park and recreation ground—a proposition which has met with the unanimous approval of the ratepayers.

Premises in Corn-street, Bristol, are being reconstructed for the use of the Wilts and Dorset Banking Company. Mr. Sillery, of Craven-street, Strand, W.C., is the architect, and Mr. E. T. Hatherley, Stokes Croft, Bristol, the contractor.

The East Ham local board have accepted a tender of £2,975 from Mr. Jackson, of Plaistow, for the construction of a northern main sewer for the Manor Park district.

The Llandudno commissioners have decided to call in an expert engineer to advise upon a scheme of sewerage for the district prepared by their surveyor, Mr. E. P. Stephenson, and provisionally adopted by the board.

Mr. F. H. Tulloch, A.M.I.C.E., and Inspector of the Local Government Board, held an inquiry at Beckenham on the 23rd ult., as to the proposal of the local board to borrow £4,637 to execute certain public and private street improvements, and to contribute £100 towards the purchase of the manorial rights in West Wickham Common, with the view of preserving it as a public open space. It was stated that towards the purchase price, £2,000, £1,000 had been privately subscribed, and £500 had been contributed by the Corporation of London, who proposed to come down and hold a formal opening. The inspector said he would report in favour of the proposed contribution.

At Great Carlton, the east window has been filled with stained glass representing the risen Saviour at the open tomb, a memorial of the late Canon Petyman, for 41 years rector of the parish. The artists were Messrs. Powell, of Whitefriars.

A meeting of creditors has been held in the case of Edward Morgan How, builder, of Barry Docks, late of Cardiff, whose statement of affairs shows gross liabilities of £2,520, of which £1,203 is expected to rank, while the assets are expected to produce £50. The debtor has been adjudicated a bankrupt.

Building Intelligence.

A MUNICIPAL LODGING-HOUSE IN DRURY-LANE.—A correspondent of the *Daily News* describes in detail the model lodging-house now in course of erection for the London County Council in Parker-street, Drury-lane. It is being built from designs by Messrs. Gibson and Russell, of Little Queen-street, whose designs were selected in competition. The buildings were estimated to cost £12,000, but this amount has been somewhat exceeded by modifications effected in the plans. The contractors for the building are Messrs. Holloway Brothers, of Battersea, and the clerk of the works is Mr. R. H. Kelland. The lodging house will consist of three blocks connected in the front and at the back, but separated in the middle by two courtyards, and accommodation is provided for 324 lodgers. On the ground floor will be a kitchen 63ft. by 32ft., and 13ft. 6in. in height, dining-room and day room, a work-room lavatory, and laundry accommodation. On the three upper floors are dormitories divided into cubicles, separated by corrugated steel partitions, and warmed by hot-water pipes. The corridors are laid with granolithic paving, and the large rooms on the ground floor with wood blocks.

GLASGOW.—The extensive additions which are being made to the General Post-office, George-square, Glasgow, at a cost of £30,000 will be completed in the course of eighteen months. The post-office was only built in 1879, but is now being enlarged for the second time, and will be doubled in size by an addition at the rear. The present building is not in any way interfered with, except in so far as is necessary to connect it with the new structure in the rear. Having its front elevation towards Ingram-street, it has not been necessary to adhere to the original style of architecture in the new building. The architect, Mr. W. W. Robertson, of Her Majesty's Board of Works, has therefore adopted a Renaissance style. Of the extensions, the main feature is the provision of three large rooms, each 128ft. by 80ft. in the clear, occupying the whole of one of the floors. On the ground floor there will be a new sorting room, and on the first floor is a new letter-carriers' room, and over it again is the telegraph room, with large roof-lights in addition to the windows. The sorting and letter-carriers' rooms are 21ft. in height, the telegraph room has a height of 25ft. In each, too, save by half a dozen supporting columns, the floor space is uninterrupted. The basement is taken up with the engine-room and the boiler-house required for the working of the pneumatic tubes, and the supply of the electric-light. In the basement also accommodation is found for the telegraph delivery room and the telegraph messengers' kitchen. The contractors are Messrs. M'Kessock and Son, Glasgow, and Messrs. Morrison and Mason, Glasgow.

NEWPORT, MON.—Banking premises have just been erected at the lower end of High-street for the National Provincial Bank of England. The façades are of Box and Monk's Park Bath stone above a plinth of Devon granite. The bank building shows five bays in High-street, and a corresponding number in Tredegar-place. The principal enrichment to the exterior is the sculptured floral frieze above the second story window, which runs along the greater portion of both fronts of the building. The floors are fireproof, the joists consisting of iron, filled with Portland cement and concrete, and the flooring is of oak-block and mosaic. The bank-room is 42ft. square, and is surrounded with pilasters of Devonshire marble, with bases of faience work, and Caen stone capitals of the Ionic order. The dado is also of faience work. The panelled ceiling is of adamant plaster. The strong rooms, three in number, are lined throughout with white glazed bricks. The whole of the work has been carried out by Mr. John Linton, builder, of Newport, working from plans prepared by Mr. C. R. Gribble, architect to the banking company. Mr. Thomas Colley, of Clapham, is the sculptor.

TEMPLE-STREET, E.C.—The Law and City Courts Committee of the Corporation of London, to whom it was referred to give directions for the preparation of plans for the erection of Ward's City of London School for Girls, have presented a report to the Common Council on the subject. The site chosen for the proposed school buildings is situated on the east side of the street between

Temple-street and the Victoria Embankment roadway, and is adjacent to the Guildhall School of Music. The City Surveyor, Mr. Andrew Murray, laid before the committee drawings, showing plans and sections for the proposed school, and also six alternative elevations, together with estimates of the cost of the building and fittings. The plans provided for the accommodation of upwards of 400 pupils, and the committee recommended that the plans and sections, together with the elevation in the Gothic style, be approved by the Court of Common Council, and that they be authorised to give directions for the erection of the school in accordance therewith, at the cost estimated by the City Surveyor—viz., £15,400, and an additional sum of about £2,000 for fittings.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The forty-ninth congress of this association, held at Cardiff last week, was brought to a close on Saturday. On Thursday morning the members visited Caerleon. Mr. Loftus Brock conducted the party to the Roman amphitheatre and the camp, making various comparisons with the Roman stations at Caer Went, Caerleon, and Cardiff, and the museum of Roman and Celtic objects found at Caerleon was visited. Another section of the society assembled at Cardiff Castle, where they were met by Mr. E. W. M. Corbett, who conducted them through the castle, and pointed out the Roman remains in the grounds, the foundations of the house of Black Friars, of which little beyond the ground plan of the walls remains, and Herbert House, built on the ruins of White Friars. A few of the members made their way to the Cardiff Museum to see the antiquities found at Penarth, Barry, Llantwit Major, and other places. In the afternoon the party visited the church of St. Fagans. On the lawn of the castle close by is placed a large leaden cistern measuring 20ft. in circumference and 3ft. 8in. high. This is said to be one of the finest specimens of ornamental lead casting extant; it bears the date 1620, and was found in an inclosure not far distant. The party then proceeded to Talygarn, at the invitation of Mr. G. T. Clark, where a large collection of armour and weapons was shown. The evening meeting was abandoned on account of the late return of the party.—On Friday the members were conveyed in brakes to see the Cromlechs of Dyffryn and St. Nicholas, near Cardiff, which were described by Mr. Franklin G. Evans. Thence the party went to Llancarvon Church. At the church at Llantwit Major, with its inscribed crosses, the guide was Mr. Nicholl, F.S.A. The party then visited Fommon Castle, the seat of Mr. O. H. Jones, who gave an account of the building.

A new Free Presbyterian church was opened at Cowdenbeath by the Rev Dr. Stalker, Glasgow. The church has sitting accommodation for 600 worshippers, and has, with a hall adjoining, been erected at a cost of £2,000.

A marble bust of Dr. Alexander Bain, presented by subscribers in recognition of his services in connection with the establishment of the Public Library in Aberdeen, was unveiled on Friday in the reference room of the library. The bust is the work of Mr. H. Bain Smith, of London.

At the new Springburn Public Park, situated at Balgray Hill, Glasgow, on Friday, Mr. James Reid, of Hyde Park Locomotive Works, formally presented a bandstand to the Springburn district of the city. The stand is an octagonal one of iron with Corinthian pillars, and is adorned with shields bearing the city arms, and the park in which it is placed is 56½ acres in extent and cost the corporation about £21,000. It is intended to fringe the outskirts of the park with a single terrace of dwelling-houses.

The members of the Hampshire Field Club spent an interesting day in the Isle of Wight on Wednesday week. Newport was the rendezvous, where, at eleven o'clock, a party of sixty, including contingents from Southampton, Romsey, Winchester, and Portsmouth, as well as the Isle of Wight, gathered, and proceeded in brakes to Gatoombe. Here the parish church was described by the Rector, and afterwards three manor-houses were seen—that at Sheat, containing a Jacobean oak-panelled room; that at Billington, where the oak staircase was of the Queen Anne period; and that at Kingston, another Jacobean building. Kingston, Shorwell, and Carisbrooke churches completed a full and interesting programme.

Engineering Notes.

BARNTON, NEAR EDINBURGH.—The works on this branch line of the Caledonian Railway system, which is intended to open up Barnton estate for feuing, continue to make good progress. The total length of the line is about 2½ miles, and this has all been roughly formed. In all about 93,000 cubic yards of cutting have been executed, or about 75 per cent. of the whole. There are to be two passenger stations on the line—at Bartongate and Cramond Brig.

BURGHHEAD AND HOPEMAN RAILWAY.—The Highland Railway Company have nearly completed the extension of their Burghhead branch to the quarries of Cummingstown and the harbour of Hopeman. The new line, which is two miles and one-third in length, for the greater part of the distance from Burghhead to Hopeman skirts the seashore, and passes through Greenbrae Quarries, supplying a fine yellow stone much used for building purposes in the north. At the west end of the quarries Cummingstown Station will be erected. The line then runs on to the harbour at Hopeman. At Burghhead a new passenger station is also being erected at the south end of the town, and the present station will be devoted to goods traffic.

THE METROPOLITAN EXTENSION TO AYLESBURY.—The extension of the Metropolitan Railway Company's system from Chalfont to Aylesbury was opened yesterday (Thursday) morning for traffic. This extension, which was sanctioned by Parliament in 1881, commences by a junction with the line recently opened to Chesham, about midway between Chalfont-road Station and Amersham. From this junction the railway proceeds to Amersham, where the first station on the new extension is placed. From thence the line passes through Piper's Wood, Lott's Wood, Little Missenden, to Great Missenden, where the second station on this extension is erected a little to the north of Abbey Park. Running thence in a slightly north-easterly direction to Wendover, where the third station is placed, the line proceeds to the fourth station on this new railway, at Stoke Mandeville. From thence the railway passes in a direct line to Aylesbury, where a temporary station has been erected pending the construction of a permanent joint station. The whole of the skylights over platforms, goods stations, &c., on the line have been glazed on W. E. Rendle and Co.'s patent system. Although this line has been constructed at the cost of the Metropolitan Railway Company, and completes the whole of the northern extensions of that company at present authorised by Parliament, the railway is practically part of the still greater scheme by which the Manchester, Sheffield, and Lincolnshire Railway will be brought into London, and the Bill for which only awaits third reading in the House of Lords and the Royal Assent to be passed as an Act.

CHIPS.

The new hospital, Dunedin, New Zealand, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves with descending smoke-flues. The same being supplied by Mr. E. H. Shorland, of Manchester.

Stained glass has just been inserted into one of the windows in the nave of Idle Church, in memory of the late Mr. Benjamin Thornton and his wife, by their daughter, Mrs. Fletcher, of Idle. The work is from the studio of Messrs. Powell Brothers, of Leeds.

A church to seat 450 is being built at Castlebay, Island of Barra, by the Home Mission of the Church of Scotland, for the accommodation of the parishioners and fishermen coming to the island for the fishing season. The church is built of the local gneiss, with dressings of Portland cement concrete, in Lancet Gothic, with open-timbered roof, from designs by Messrs. Hardy and Wight, architects, Edinburgh, to cost about £1,100.

A new fire-station, erected at a cost of £14,000, was opened at Leicester on Tuesday.

The congress of master builders, held at Kiel, was forcibly dissolved by the police authorities on Tuesday as a precaution against the spread of the cholera.

The governors of University College, Dundee, have decided to enlarge the building erected ten years ago by the addition of an eastern wing containing classrooms, and the improvement of the front elevation of the existing buildings. The estimated outlay is £5,000.

TO CORRESPONDENTS.

(We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.)

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of THE BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASMORE EDWARDS.

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ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two the minimum charge being 5s. for four lines.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL., XLI., XLVI., XLIX., L., LI., LIII., LIV., LVIII., LIX., LX., LXI. and LXII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—F. R. Bros.—J. R. Co.—B. and M. T. Co.—Surveyor.—Thos. Jacques.—Benj. D. (Lincoln).

Intercommunication.

QUESTIONS.

[10397].—**National Gallery.**—How is permission gained to photograph pictures in the National Gallery? I see reproductions offered for sale by different reproductive processes. Is permission to do this obtainable?—N.

[10398].—**Hoisting Drum.**—Some time ago, when in London, I saw from a distance a large wood drum turned by two men. This was used for raising barrows containing bricks, one barrow descending empty as the loaded barrow ascended. Would some of my fellow-readers who have adopted this arrangement kindly, through this paper, give me sketch, dimensions, and all particulars of drum and frame?—A. B.

[10399].—**Brickworks.**—Will a square chimney stack 90ft. high, 7ft. by 7ft. inside at base (divided by a 9in. fire-brick partition 14ft. high), and diminishing to 4ft. by 4ft. at top, produce a sufficient draught to work the flues (1ft. 3in. wide by 9in.) under the drying sheds (having a superficial area of 11,300ft.), the longest of which being 222ft., and the shortest 147ft. before entering the stack? Also would there be any doubt as to the successful working of another set of flues (2ft. 3in. wide by 1ft. 4in. high) immediately below, and connected with the upper ones, thus making the flues nearly twice the length? The works are not yet erected, so that advice would be appreciated; also as to the best size stack in each case, &c.—W. T. E.

[10340].—**Sewage.**—Will some fellow-reader kindly inform me the name of the best book or books treating of sewage from the time it leaves the house; also the best book on water and hydraulic apparatus, with the prices of each, and oblige—SANITAS.

[10341].—**Books.**—I would be glad to know of some really first class books on Renaissance detail, with some idea of price.—ARCHITECT.

REPLIES.

[10396].—**The Chester Rows.**—Hemingway, in his valued "Hist. of Chester," published 1831, says: "To trace the origin and cause of these Rows with any degree of certainty is no easy task, concerning which a variety of conjectures have been formed. Some have attributed their origin to the period when Chester was liable to frequent attacks from the Welsh, which induced the inhabitants to build their houses in this form, so that they might avoid the danger of the horsemen, and annoy their assailants as they passed through the streets. I am

aware that this has long been, and still is, the popular sentiment; but I think there is irrefragable evidence that the form of our city is Roman, and that the walls were the work of that people." Pennant appears to have been governed by this view. He says: "These Rows appear to me to have been the same with the ancient vestibules, and to have been a form of building preserved from the time the city was possessed by the Romans, and were the places where dependants waited for the coming out of their patrons."—A. L., Chester.

Legal.

LIABILITIES OF LOCAL BOARDS.

IT has once more been decided by the House of Lords, in a recent case affecting the New-market Local Board (*Times*, August 10), that a local board cannot be made liable in an action for damages for personal injuries sustained through non-repair of the highway. The facts of the case were simple enough, and such as may at any time be repeated. The plaintiff, going along a footpath, part of the highway, on a dark and rainy night, fell by reason of a slope which had been cut as an entrance to a stable yard. The ground of complaint against the local board was that they had passed the work, including this slope, as satisfactory, and had not taken care to have it protected by a dwarf wall, or to have the place properly lighted by putting a street lamp near to the spot. The jury had found that the footpath was not sufficiently lighted, and gave a verdict for the plaintiff with damages. But the Judge who heard the case set aside their verdict on the ground that the local board had not neglected any duty imposed upon them, nor done any affirmative act for which they were responsible, and the Court of Appeal confirmed this ruling.

The House of Lords now took the same view; but they based their decision upon broader grounds. They decided that where a roadway ought to be repaired by the public through the surveyor of the local authority, no action for damages for injury can be maintained against that authority for an accident arising from their neglect. In this case the ground of action was really the defective construction of the entrance to the stable forming a portion of the public footpath. The plaintiff, therefore, failed entirely in his action, as he could not show that the local board had failed in any particular duty, or were in any way bound to place a lamp-post to light that special spot. Possibly there would have been some ground for proceeding against the local board, or its highway surveyor, by indictment for a nuisance; but at all events, there was no ground of action for damages to a private individual in such a case.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

A. G. F.—**DRAINS—EASEMENT.**—It would seem that B' has acquired a right of way over A's land for his drain, both by long user and by A's own acquiescence. The best way out of the dilemma would be to call in the sanitary authorities, who would probably require that B. should construct a separate drain to the common sewer on his own ground, and not under A's house, if that is possible.

C. O. S. and S.—**BUILDING CONTRACT—SCHEDULE OF PRICES.**—This schedule of prices is referred to in, and so is made a part of, the contract; and each party thereto should properly have had a copy of that schedule. It appears to have been the intention of the parties that this schedule itself should be left in the custody of the architects engaged, and I do not consider that they can be bound to part with the original. But they might let the employers have inspection, or, even, a copy at their own expense.

Z. O. M.—**DRAINAGE—RIGHT OF WAY.**—The question whether your neighbour B. has any right of way over your land for his drainage must depend on the respective deeds under which you both hold the property. But he certainly cannot compel you to find larger pipes for his convenience. The shortest and simplest way out of the difficulty would be to get the sanitary inspector to condemn the old system of a connected drainage, and insist on separate pipes.

A Local Government Board inquiry has been held at Marehay, near Belper, before Mr. F. H. Tulloch, A.M.Inst.C.E., with reference to an application made by the Belper Rural sanitary authority for permission to borrow £3,700 for the purchase of land for sewage disposal. Mr. Robert Argyle, C.E., of Ripley, Derbyshire, is the engineer of the scheme adopted.

LEGAL INTELLIGENCE.

IS A TIMBER STAGE A "BUILDING"?—James Smith, builder, of Romford-road, Manor Park, was summoned to the North London police-court on Friday by Mr. Legg, district surveyor of Hackney, for erecting a building at No. 33, High-street, Kingsland, with walls constructed of brick or stone, and covering the roof with slates or tiles and providing proper foundations, as required by the Building Act of 1855. The building in question was a large erection, part shop, part timber stage, near Dalston Junction, and when the district surveyor called the defendant's attention to the fact that he had not given the required notices the reply was that it was not a building—it was merely a timber stage. The owner of the structure (Mr. Tappin) was first summoned; but on the present defendant admitting himself to be the builder, the original summons was dismissed, and the present one taken out. The structure is 17ft. wide, 42ft. long, and 32ft. high; it stands upon timbers for a foundation, and has revolving shutters at the lower portion, and in this are retained, besides lengths of timber, various wooden manufactured goods, such as meat safes, cornice poles, step ladders, &c. Mr. Corser, in giving his decision, said this was clearly a contravention of the Building Act. He was not going to say all timber stages are buildings; but, from what he had heard and seen of the structure in question, he came to the conclusion that it was a building within the meaning of the Act, and that the requirements of the district surveyor must be complied with. Mr. Justice Byles, in an elaborate decision on the oft-debated question as to what is a building, said each case must be taken on its merits. This structure was permanently used as a shop, and was abutted on by houses and shops wherein people resided. It had been pleaded that the sides of the structure were not inclosed; but this suited the particular trade, and could not be an argument against the assertion that the place was a shop. The order would be to comply with the district surveyor's requirements.

CLERKS OF WORKS' OFFICES AND THE BUILDING ACT.—At Lambeth Police-court on Tuesday, Mr. John Fyfe, of the Estate Office, Electric-avenue, Brixton, appeared in answer to an adjourned summons for having set up a certain structure of a movable or temporary character without the license of the London County Council. Mr. T. Chilvers stated that defendant had already been fined for the structure in question. The defendant afterwards applied to the Council for a license, but they refused to grant it. The defendant had not removed the structure, and up to the date of the summons he had incurred penalties amounting to £46. Mr. Kingsbury, for the defence, said the defendant was under a misapprehension. The structure was an office put up for the use of the clerk of works, but the defendant was ready to undertake to pull it down immediately. Mr. Biron said he would reduce the pounds to shillings on the understanding that the structure was pulled down in a week. He fined the defendant 46s. and 42s. costs.

Mr. Till, the city surveyor of Birmingham, is trying experiments with a new sewer ventilating apparatus which he has had erected at the junction of Hayley and Clarendon-roads in that city. It is one of the many forms of combined street lamp and sewer ventilator, and has an attenuated conical iron cap rising above the pipe.

At the London Consistory Court, on Monday, Dr. Tristram was asked to grant an application for a faculty for rebuilding the Church of St. Peter, Regent-square, and providing schools, mission buildings, and vicarage house upon the site; or, in the event of this not being adopted, for the faculty to underpin and repair the existing church, taking down galleries, and to separate a portion of it for parochial purposes. It was stated that the church has fallen into a condition of great decay, and that reconstruction or extensive repair is absolutely necessary. The Chancellor reserved judgment.

An inquest was held at Woolwich, on Tuesday, into the death of William M. Forbes, 45, a bricklayer and retired sergeant of the Royal Engineers. A foreman and three bricklayers were at work in the Royal Arsenal gas factory erecting the archway of a new retort, when, on striking the centre of an arch which had just been built, the structure fell, and deceased was buried under 40 tons of debris. Two other men were injured, one of whom, Henry Flowers, appeared on crutches to give his evidence, the third man, William Hunt, being unable to leave the infirmary. The accident was attributed to the work being green, and to the arch being struck before some iron stanchions had been affixed to it. It was stated that the foreman was competent for the work, though there had been an error of judgment committed by the arch being struck too soon, and before the supports had been put up. The jury were of opinion that Forbes came by his death through an error of judgment on the part of the foreman, Daniel Tytheridge; but that there had been no criminal negligence.

WATER SUPPLY AND SANITARY MATTERS.

ANNAN, N.B.—A meeting of the Annan district committee of the Dumfriesshire county council was held on Friday in the town hall. An extensive scheme for the supply of water to the numerous villages and farms in the district was considered. The proposal was to construct a reservoir on the Mein at Torbeckhill, 526ft. above sea level, with a storage capacity of 30,000,000 gallons, and to distribute the water by main pipes laid along the public roads over a radius extending from Springfield on the east to Locharwoods and Dalton on the west. The district was surveyed by Mr. James Wilson, C.E., Greenock, who estimated the cost of the scheme at £38,000. The sub-committee who recommended the scheme calculated that the annual burden would be £2,400. After discussion, further consideration of the scheme was adjourned until a plebiscite has been taken.

CHIPS.

Two new halls at Folkestone, for the Church Congress in October, are being actively pushed forward in the Exhibition Palace grounds, the larger of which will seat 3,000 members. The Ecclesiastical Art Exhibition will occupy part of the palace.

The trustees of Finsbury Chapel, near Broad-street Station, having surrendered their lease to the Corporation, the site is now in the market on a building lease.

A fire broke out on Saturday under the stage of the Metropolitan Opera House, New York. The firemen were able to save the façade of the building with its business premises; all the rest was destroyed, and the damage is estimated at between one and two hundred thousand dollars.

At the half-yearly meeting of the shareholders in the Manchester Ship Canal, held on Tuesday, the directors' report, which admitted that the new estimate shows the necessity of taking steps at once to obtain further Parliamentary powers to raise at least £1,500,000, in addition to the capital already authorised, was confirmed. Lord Egerton of Tatton, the chairman of the company, urged that by reason of unforeseen contingencies the estimates had necessarily been increased from time to time; but he confidently hoped for the completion of the waterway by the end of 1893. He had never less despaired of the future of the canal than at the present time.

A church, to be dedicated to St. John, is about to be built at Ripley, Derbyshire, from plans by Messrs. Naylor and Sale, of Derby and Lincoln. The estimated cost is £2,700, of which more than two-thirds has been raised.

The water-colour painter, Rudolph Alt, who is widely known by his architectural pictures, mostly of Vienna and Venice, entered his eightieth year on Sunday. The event was celebrated by a banquet given by the Vienna artists, and by the opening of a special loan exhibition of Alt's water-colours. Although not complete, it already numbers 528 works, from the first, painted in 1829, to the last, only just finished, representing the Radetzky monument and its surroundings.

Foundation stones of a Conservative clubhouse were laid at Clayton, near Halifax, on Saturday. Mr. S. Spencer, of Great Horton, Bradford, is the architect, and the cost will be £1,700.

The first mayor of the newly-created borough of Thornaby-on-Tees (late South Stockton) will be Mr. William Anderson Magin, of the firm of Head, Wroughton, and Co., bridge builders, who is also appointed under the charter provisional mayor to carry out the preliminary proceedings, and conduct the first meeting. Mr. Magin is the present chairman of the local board.

Two stained-glass windows have just been unveiled in St. Stephen's Church, Bowling, Bradford. "Our Lord's Sermon on the Mount" and "Disputing with the Doctors" are the subjects illustrated. They are from the studio of Messrs. Powell Brothers, of Park-square, Leeds.

New swimming-baths at Wellingborough were formally opened last week. Messrs. Duley and Sons were the contractors.

The last of the season's excursions of the Archaeological section of the Birmingham and Midland Institute took place on Saturday, when a visit was paid to Nottingham Castle and Wollaton Hall. Mr. A. Marshall, architect, of Nottingham, met the party and acted as guide.

The Trafalgar-square Theatre, St. Martin's-lane, erected from the designs of Mr. Walter Emden, will be opened on Monday week, the 10th inst. It is isolated on three sides, is Italian in style, and has a chief frontage of brick and stone. Internally the house consists of four tiers, and seats 1,250 persons. The theatre was illustrated in our issues of Nov. 27, 1891, and March 25, 1892.

Our Office Table.

THE autumn exhibition of the Royal Birmingham Society of Artists has just been opened, and is of more than average interest. Among the most noteworthy pictures are the "Sic Transit," by G. F. Watts; "The Kiss," "Phidias and the Elgin Marbles," and "A Roman Amateur," all by Alma Tadema; some Italian subjects by W. Aumonier, Adrian Stokes, and Henry Wood; W. Logsdail's realistic "Ninth of November." Among the portraits may be singled out those of J. R. Pettie, R.A., by A. S. Cope; Val Prinsep's "Black Pearl," and Herkomer's powerful "Board of Directors," which attracted so much attention at Burlington House this spring. The best landscapes are contributed by H. W. B. Davis, David Murray, Alfred East, F. G. Cotman, Ernest Parton, and C. E. Johnson. Of the humorous subjects "Between Two Fires," by F. D. Millet, lent by the Chantrey trustees, and "The Skipper Prescribes," by Albert Sterling, are the best.

The autumn exhibition in the City Art Gallery at Manchester will be opened on Tuesday next, the 6th inst. Among the portraits that of Mr. Alfred Waterhouse, R.A., by Alma Tadema, hung at the recent Academy, will be of the greatest interest in the city which counts as its chief architectural adornment the Town-hall reared from Mr. Waterhouse's designs. Other works from the late Academy show are Stanhope Forbes' "Forging the Anchor," Val Prinsep's too-theatrical "Broken Idol," and "The Annunciation," by Arthur Hacker, deservedly purchased by the Chantrey Fund.

An exhibition of laundry and other appliances at the Central Hall, Holborn, closes tomorrow. There is not much there worth attention. The visitor will not fail to notice in the centre of hall Messrs. Doulton's stand, where may be seen in operation an apparatus for softening water, specially adapted for laundry purposes. The Blackman Ventilating Co. (Limited), Fore-street, London, &c., show several fans and a tubular air-warmer. The Blackman system of rapid drying for laundries, &c., is an important exhibit. A dry wind produced by a fan is used, and the apparatus we saw is placed on brickwork, and is capable of sending out a dry wind of 140° or more. The time of drying a blanket from the hydro is from 30 to 40 minutes, and for cotton goods from 15 to 5 minutes, according to substance. By this very economical system and apparatus, which can be applied to any room, a constant supply of dry air is obtained, and the drying is effected at a very considerable reduction of cost.

The official list of the successful candidates at this year's "examination" in connection with the Westminster School of Art at the Royal Architectural Museum, has just been published, showing a record which will compare with any other similar school in the country. Eleven obtain "first-class excellent" for drawing from the life; twelve "first class," and forty-three "second class." Three obtain "first-class excellent" for drawing from the antique, twelve "first class," and twenty-eight "second class." In the memory drawing from the antique, composition from a given figure subject, plant drawing, still life and anatomy, good results are also shown. In the second-grade examinations the pupils are not so numerous. A silver medal in the National competition is obtained for a modelled design for wall decoration by Fredk. J. Langer. Queen's prizes are taken by five students, and three others for fine modellings from the panel or cast obtain national book prizes.

THE Bristol City Council have just received a report from their finance committee as to the accommodation required for municipal offices. Two years ago the council purchased the property at the corner of Corn-street and Broad-street, adjoining their present Council-house, as a site for extended offices; but although a committee then recommended that competitive designs for the proposed new buildings be invited, the cost to be restricted to £80,000, no further steps have been taken. They now report that the accommodation required would include a council chamber, 50ft. by 32ft.; a committee-room, 28ft. by 16ft., and two smaller rooms; and five rooms for the chief officials, each 22ft. by 16ft., with smaller rooms attached *en suite*, while desirable additions would

be a public hall and a gallery for the exhibition of pictures, all of which accommodation could be provided on the property now in the possession of the council. Consideration of the report has been adjourned.

The annual meeting of the Royal Victorian Institute of Architects was held on July 19 last, Mr. G. C. Inskip, F.R.I.B.A., President, occupying the chair. The annual report and balance-sheet were read and adopted, and the president read a valedictory address, in the course of which he advocated the federation of all the Australasian societies representing architects, and congratulated the members on the fact that the Registration of Architects Bill, unanimously adopted by a joint committee of the Institute and outsiders, was now before the Victorian Parliament as a Government measure. The election of office-bearers for the ensuing year resulted in Messrs. A. E. Johnson and P. Oakden being elected as vice-presidents, Mr. W. Lucas as hon. treasurer, Mr. W. U. Billing as hon. secretary, and Messrs. F. Purbrick, W. B. Tappin, and R. G. Hyndman as the council.

At the last meeting of the French Académie des Inscriptions, M. Toutain gave details as to the Roman Theatre of Simithu, at Chemtou, Tunis, which he has recently been excavating. This theatre has several peculiarities of construction. The lower part of the semicircle of seats, which was completely covered up when M. Toutain commenced his excavations, is very well preserved, and the place occupied by the orchestra has a mosaic pavement representing all the varied colours of Numidian marble. The stage has not yet been excavated, but in the course of the researches already made several coins of the reign of the Emperor Philip have been discovered, as well as fragments, showing that the theatre was transformed into dwelling-houses before it was left to go to ruin.

The Architectural Association.—September 3. Summer visit to St. Alban's Abbey and town. This visit, advertised in last week's issue, is postponed until Oct. 1, to meet the convenience of members wishing to take part.

ERNEST S. GALE } Hon. Secs.
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CHIPS.

The work of sewerage of the village of Bushey, near Watford, has just been commenced. Mr. Urban Smith, of Hertford, is the engineer, and Mr. Jackson is the contractor.

The Lord Mayor of London opened on Friday an eastern wing which has been added to the Marine Hotel at North Berwick. The new wing measures 74ft. by 60ft., having a tower at each corner carried to a height of 90ft. The work was in the hands of the firm of Messrs. J. Watherston and Sons, Edinburgh.

Mr. T. E. Wilford, a clerk of works under the School Board for London, died last week at his residence in Stoke Newington, at the age of 45. For some years he held a similar appointment under the borough surveyor of Leicester, and resigned that post in 1890 for the one he held at the time of his death.

The local board of Todmorden have decided to purchase the undertakings of the three gas companies that supply the district. The terms are 18½ years' purchase on the average of the last three years' profit, or £103,362 10s.

The Government of India have unanimously agreed to present the requisite amount of gun-metal for the equestrian statue of Lord Strathnairn about to be erected at the junction of the Knightsbridge and Brompton-roads. Mr. E. Onslow Ford has been entrusted with the commission for the statue.

The Swansea Harbour Trust have instructed Mr. Abernethy to draw plans for the extension of Prince Dock, at an estimated expense of £100,000.

The foundation stone of a new school of Science and Art for Gravesend and Northfleet was laid on Thursday afternoon in last week by the mayor. The site is on the Ferns Estate, at the south side of St. James's Church.

New schools attached to Conway-road Wesleyan chapel, Cardiff, were opened on Wednesday week. The schools consist of a central hall with 20 classrooms, each seated for 30 scholars, ranged on either side, while at one end are two large rooms, each seating 200 adults or 180 infants. Messrs. Habershon and Fawcner were the architects, and Mr. G. E. Griffin was the contractor. The outlay has been £3,500.

The building of a new police station on the East Moor, Cardiff, was commenced on Monday. The contractor is Mr. T. R. Waterman, of Cardiff.

Trade News.

WAGES MOVEMENTS.

LONDON BUILDING TRADES' FEDERATION.—In connection with this recently organised body, a largely-attended meeting was held on Sunday at Putney, near the bridge. The chair was taken by Mr. Percy. Mr. Verder (secretary of the Federation), Mr. Barnes (chairman of the Executive), and Mr. Stephenson (United Builders' Labourers' Union) advocated the claim of trade unionism and the necessity of all connected with the building trade organising in order to protect themselves. It was pointed out that, since the Federation was started, two months ago, 7,000 new members had joined, bringing up the total membership to 22,000. A resolution calling on all members of the building trade in the district to organise was passed unanimously, and at the close of the meeting a large number of new members were enrolled.

WAGES IN THE EXTENDED LONDON DISTRICT.—With the exception of the strike at Bromley, the whole of the disputes in the suburban building trade, arising out of the men's demand for the advance of ½d. per hour in their wages, in accordance with the compromise agreed to at the Building Trades Conference in June, have been amicably arranged. The men have consequently resumed work. At Bromley the strike continues, and a settlement is not anticipated at present.

ABERDEEN.—The granite workers have made a request for an advance of ½d. per hour on their wages. The Granite Association represent that the trade is good enough at present to warrant such an increase, and in the interests of the Master Builders' Association it is shown that, although trade is fairly brisk, the dull season is approaching. Decision on the matter has been deferred until the societies concerned have discussed the question.

CARDIFF.—The Federated trades concerned in the dispute have agreed to send delegates to meet the employers, and these will be armed with full powers to come to a settlement. The employers will meet each set of delegates representing their own branch of the building trade in succession, and fix the terms of settlement with each branch should they come to an amicable agreement. The first meeting between the employers and the delegates representing one of the branches of the operatives took place yesterday (Thursday). The operative masons are not taking any part whatever in the fresh attempt at a settlement, and the terms which may come to between the employers and the various other branches of the building trade will not affect them.

KILBURN MASONRY.—The builders and hewers having demanded an increase of ½d. per hour, the masters conceded the advance, making the wages at present 9d. per hour.

Mr. Frank Sumner, from the office of the Willesden Local Board, has recently been elected surveyor to the vestry of Bermondsey, to fill the vacancy caused by the resignation of Mr. George Elkington.

At the Roman Catholic church at Chatham a new marble altar and reredos, designed by Mr. F. W. Walters, F.S.A., were consecrated for the Lady Chapel.

At a meeting of the governors of the Royal Albert Hospital at Devonport, held on the 22nd ult., it was unanimously decided to add a new operating theatre and hydraulic lift to the building (which was opened in 1863), at a cost estimated at from £1,700 to £2,000.

Holloway's Pills clear the furred tongue, and act as a wholesome stimulant to the liver, and as a gentle aperient to the bowels. They are the best known antidotes for want of appetite, nausea, flatulency, heartburn, languor, depression, and that apathy so characteristic of chronic derangement of the digestion.

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TENDERS.

* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

ABINGDON.—For new school and community wings at the Convent of Our Lady of Mercy, Abingdon, Berks.
Mr. J. G. West, architect:—

Hutchings	...	£4,458	0	0
Silver and Sons, Maidenhead	...	4,100	0	0
Simmonds, Bros., Reading	...	3,983	0	0
White and Sons, London	...	3,733	0	0
Kingler, Oxford	...	3,694	0	0
Robinson, Wolvercot, Oxford*	...	3,595	0	0
Wilkins and Sons, Oxford	...	3,490	0	0
Wheeler and Sons, Wantage	...	3,195	0	0
Sharpe and Sons, Amphilth, Beds	...	3,180	0	0
Buckingham and Son, Winchester	...	3,092	0	0

* Accepted.

ABINGDON.—For new premises, High-street, Abingdon, for Mr. J. C. Clarke:—

Kingler, T., Oxford	...	£1,030	0	0
Wilkins and Sons, Oxford	...	993	0	0
Goodchild, W., Reading (accepted)	...	852	0	0
Buckle, J., Abingdon	...	826	0	0
Wheeler, T., Abingdon	...	815	0	0

ANNESLEY.—For building Wesleyan schools, Annesley, Woodhouse. Mr. J. Wills, F.S.Sc., Derby, architect:—
Munks, J., Hucknall Torkard* ... £703 10 0
* Accepted.

ASHFORD, KENT.—For the erection of new printing works, for Messrs. H. D. and B. Headley (exclusive of machinery). Mr. Henry J. Jeffery, architect. Quantities by the architect:—

Joy, E., Ashford	...	£1,095	0	0
Steddy and Co.,	...	1,030	0	0
Baker, W.,	...	1,000	0	0
Wood, J.,	...	1,000	0	0
Howland, C.,	...	980	0	0
Knock, H. (accepted)	...	965	0	0

All of Ashford.

BECCLES.—For drainage at the Grange (Building) Estate, Beccles, Suffolk. Mr. Arthur Pells, F.S.I., Beccles, surveyor:—

Trew and Co., Ipswich	...	£287	0	0
Allen, Beccles	...	283	16	0
Church, Lowestoft	...	277	19	0
Johnson, Beccles (accepted)	...	260	0	0

(Surveyor's estimate, £277 5s.)

BISHOPSTOKE, HANTS.—For road making, fencing, &c., for the county of Hants Land and Building Society. Mr. William Borough Hill, F.S.I., Southampton, surveyor:—

Paddington, J. F., Bishopstoke	...	£1,200	0	0
Butt, J., (road and fences) Southampton	...	1,062	18	5
Clark, J., and Son, St. Cross, Winchester	...	1,005	10	10
Morgan, Istel, and Morgan, Southampton	...	998	0	0
Sanders, H. J., Southampton	...	910	0	0
Crook, J., Swathling, Southampton*	...	857	7	0

Fencing:—

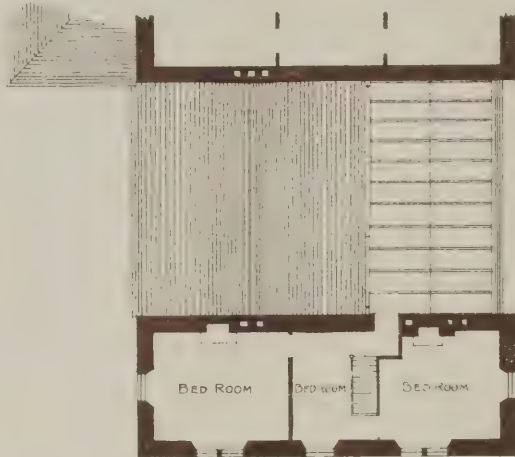
Morgan, Istel, and Morgan, Southampton	...	234	0	0
Paddington, J. F., Bishopstoke	...	193	0	0
Wheeler, H., Son, and Coombs, Bishopstoke	...	140	8	2
Ayles, E., Ringwood	...	119	14	8
Smith, W., Baddeley, Southampton	...	75	12	6
Sanders, H. J., Southampton	...	75	0	0
Crook, J., Swathling, Southampton*	...	71	7	0

* Accepted.

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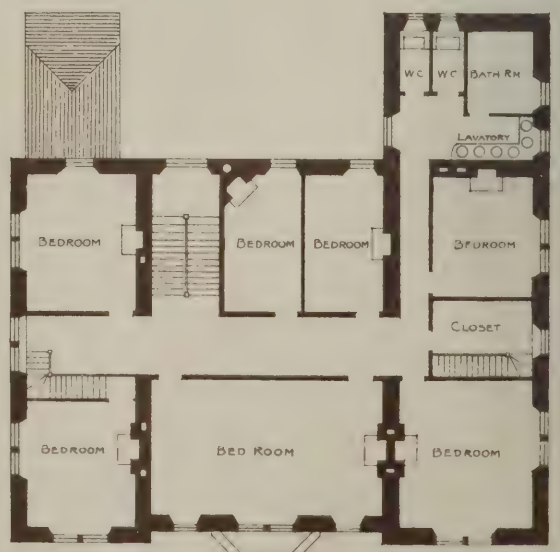
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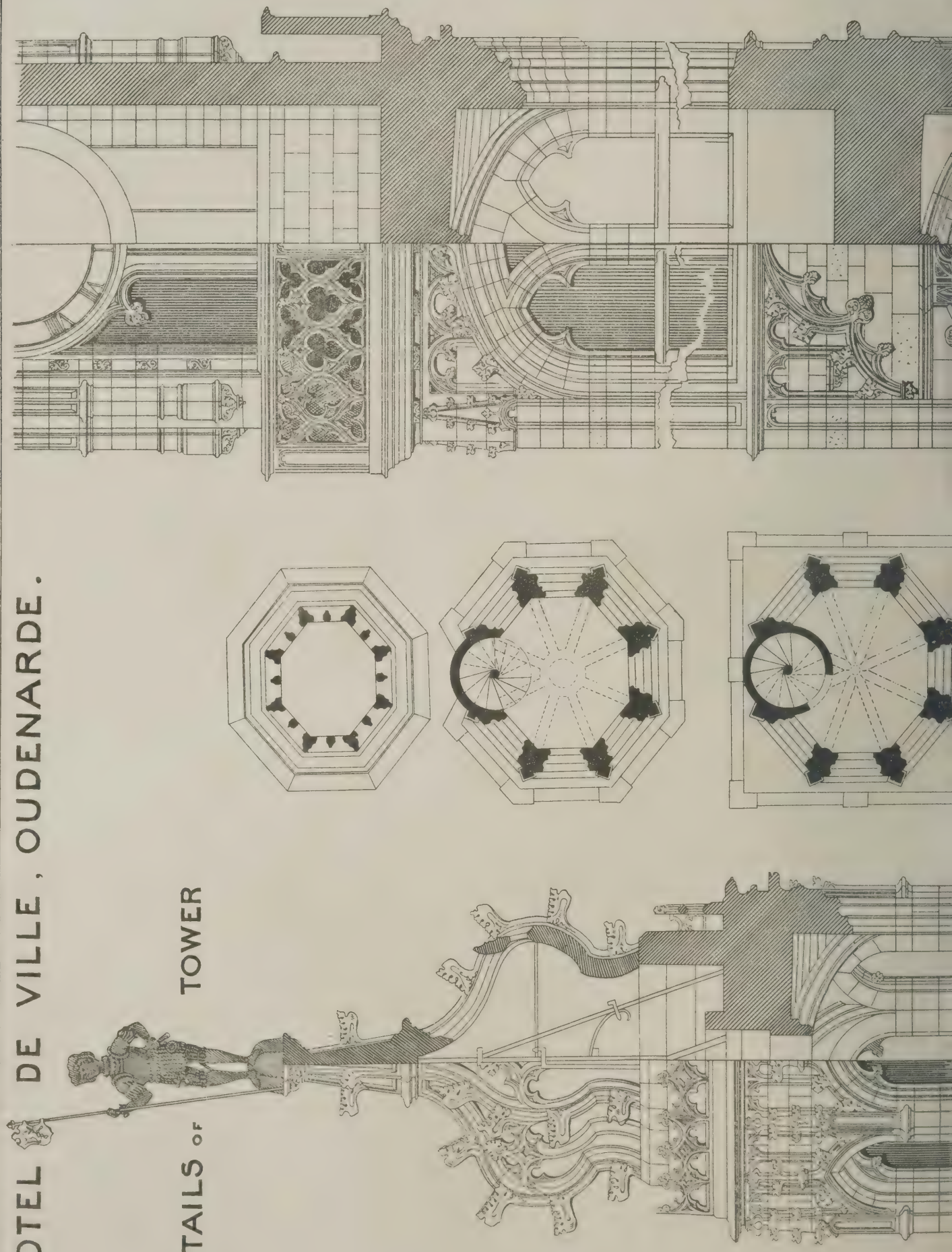


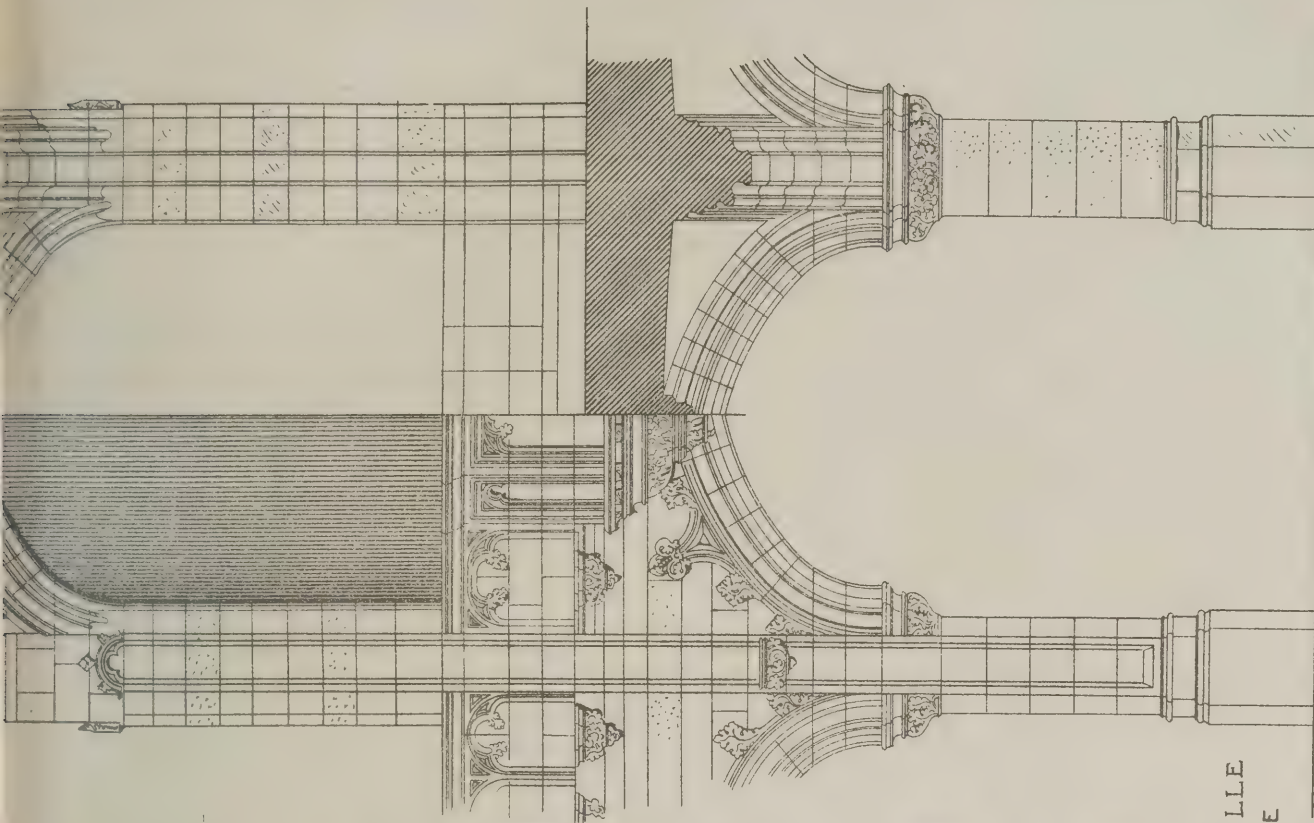
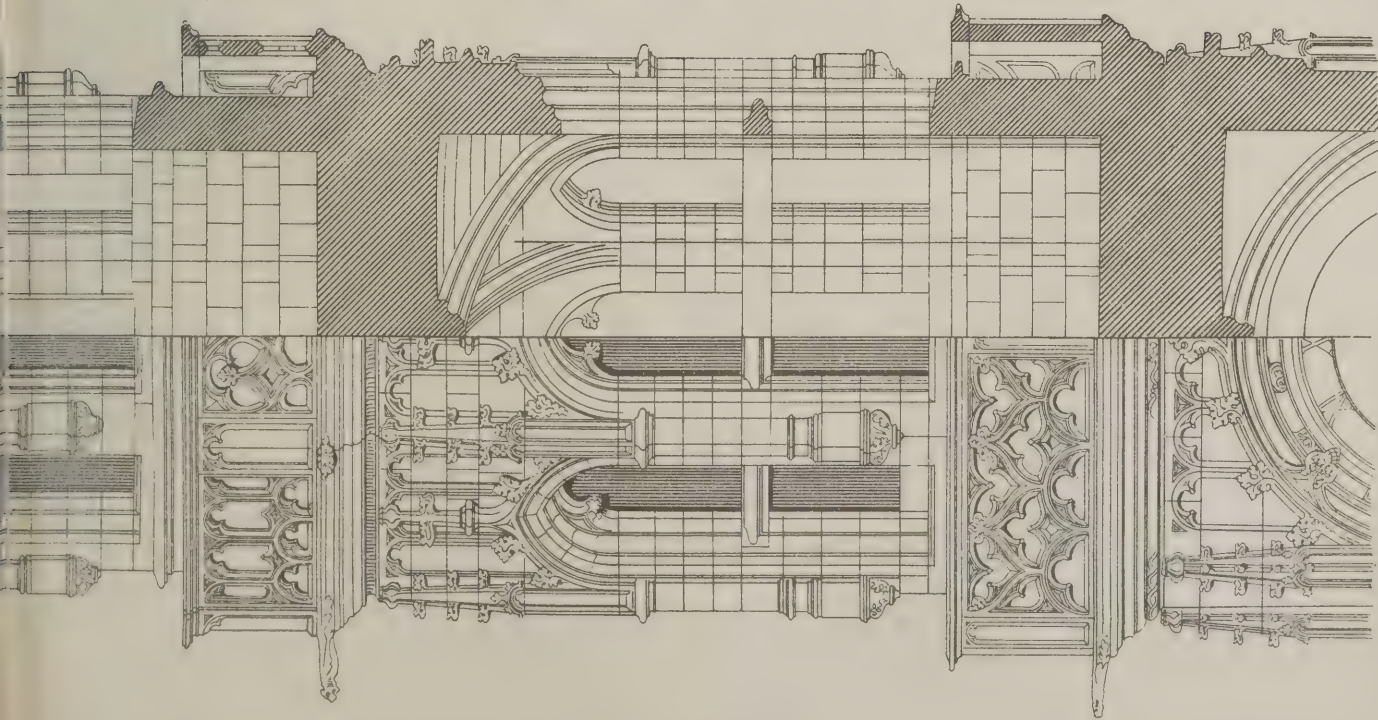
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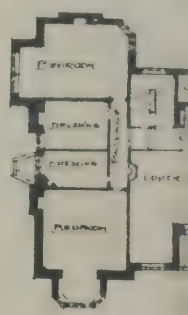
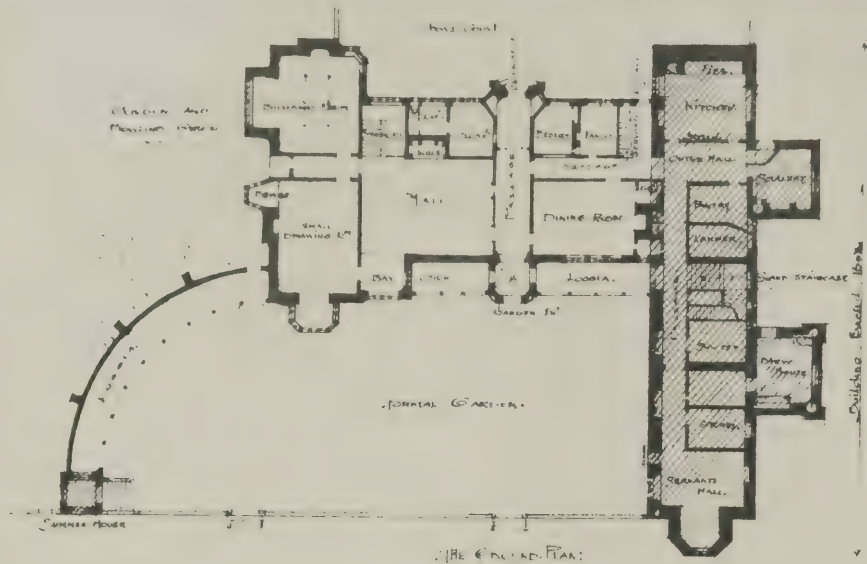




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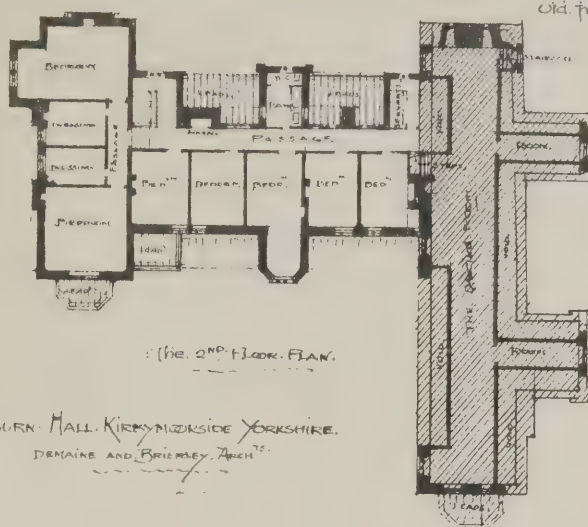
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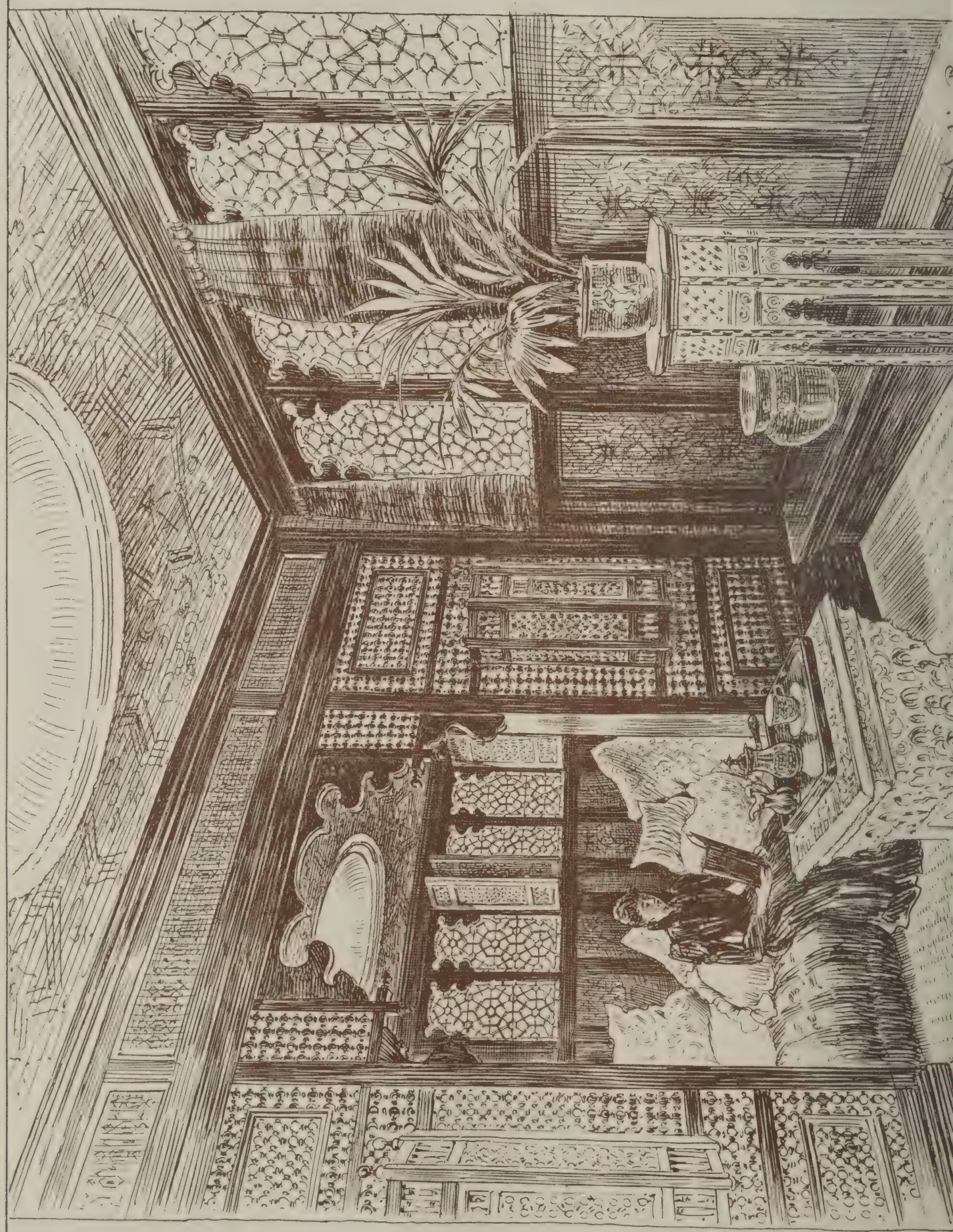


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THE DINING ROOM.

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views will be distributed into the appropriate places. The corresponding printed matter may go along with them, and the owner's personal sketches and memoranda may be dealt with in the same way. This will occupy a few minutes weekly, but it will save hours of searching at some future time—a time, in all probability, when hours can ill be spared.

Fewer portfolios will serve for the next great division—that of “Materials,” and these will be occupied more by written and printed matter than by views. Case 1, for Concrete, may contain notes on the different substances it is composed of, and the various modes of concrete building. Case 2 may hold information about Mortar and Cement, without which the modern builder can do but little. Case 3 will be devoted to Stone. It may contain particulars of the prices, weights, and qualities of the various kinds; documents showing the pressure required to crush each kind; memoranda of the best way to recognise the bed, and cautions about the faults to which different varieties are most liable. The architect who goes about with his eyes open will be likely to add to these observations of his own as to the way in which stone from various quarries has stood the weather, both in ancient and modern buildings, and addresses of quarry-owners, which he may find it troublesome to obtain just when he wants them. Similar information will be desirable on the subject of Bricks, in case 4. The colour of different bricks will, of course, be noted, and the way in which the weather affects both colour and substance. Case 6 may be devoted to Terracotta. Case 7 will be the place for notes on Marble and Granite, in which, as in No. 3, the strength, colour, and locality will be carefully stated.

Timber, whether oak, fir, ash, mahogany, or anything else, will next have its own portfolio. A yearly list of the brands, which may be obtained from the journal of the trade, will be very useful. Tables of the strength of various woods to resist pressure and tension, and of their stiffness against cross-strain, should not be omitted; and information about the tricks and manners of the less familiar varieties may, on some occasions, prove very serviceable. Why, for instance, larch, in spite of its agreeable colour, is hardly used for anything but hedge-carpentry; and why satinwood can only be safely employed as a veneer, are bits of information which might chance to save an architect from vexatious mistakes. Slates will occupy case 8, and Tiles case 9 of this division. Memoranda of colour, price, and locality, and particularly of durability, will be amongst the chief things to preserve in each collection. No. 10 will be the portfolio for Iron and Steel; and besides notes on quality, it will contain the sections, weights, and strengths of rolled joists. Lead and Zinc will fill case 11, and Brass and Other Metals case 12. Plaster, including fibrous plaster and similar compositions, will find its home in case 13, and with it will naturally go notes about metallic lathing and similar appliances. Portfolio 14 will deal with Glass; 15 with Paint and Varnish; and 16 with the inevitable Sundries. As a supplement to the Division of “Materials,” it is very desirable to have a few shallow drawers, in which samples can be placed. Whole bricks and tiles, it is true, are too bulky to be preserved for comparison in this way. But fragments of them, large enough to show the colour and the quality, can easily be kept, while samples of marble and of various tints of antique and other superior glass are almost indispensable.

“Construction,” which is the third division, will perhaps be more rapidly filled by the junior architect than by the very experienced one. The man who is beginning practice will find something to learn from most constructional drawings. With

advancing years, he will have much of this knowledge at his fingers' ends, and will only care to preserve memoranda of the unusual or the peculiarly skilful. These may be classed under eight or nine heads, as follows: 1, Earthworks and Foundations; 2, Walls, Piers, and Buttresses; 3, Arches and Vaults; 4, Domes; 5, Wooden Trusses; 6, Iron and Steel Trusses; 7, Fireproof Floors; 8, Scaffolding and Shoring; and, 9, Sundries. This division is only meant for information about leading structural features, leaving the subordinate ones to be arranged further on. Thus, it deals with carpentry, but not with joinery; with iron roofs and trusses, but not with iron casements, railings, or ironmongery. It might at first seem well to keep a separate portfolio for theoretical mechanics, and for the rules by which strains, thrusts, &c., are calculated; but it will probably be more convenient to assort these according to the forms of construction which they pertain to. Papers on the forces to be allowed for in wooden roofs will therefore be collected in case 5, those on the thrust of domes in case 4, and so on.

“Details” come next and form the fourth division. Down to this point all architects will find themselves collecting pretty much the same subjects. They all use, more or less, the same materials; they all need to know something of the same modes of construction, and they may all be called on to design buildings of one or another class out of the forty in our list. But in the matter of details this hardly holds good. Few private libraries could contain the multitude of details appropriate to all these various classes of work. Either by necessity, or by choice, most architects are, to some extent, specialists. They need to know something about all kinds of building, and everything about one or two kinds, and it is the details of the one or two kinds which intimately concern himself, which each member of the profession will naturally aim at getting together. We may give the following as an actual example of the way in which detail drawings have sorted themselves in a practice consisting mainly of a church, school, and house building:—Portfolio 1, Domestic Joinery; 2, Staircases; 3, Balusters; 4, Doors and Framings; 5, Plaster Details, Ceilings, &c.; 6, Fireplaces and Mantels; 7, Chimneys; 8, Dormers; 9, Ironmongery; 10, Furniture; 11, Gas-fittings; 12, Piers, Capitals, and Bases; 13, Arcades; 14, Doorways; 15, Mouldings; 16, Buttresses and Pinnacles; 17, Tracery; 18, Turrets; 19, *Flèches*; 20, Finials and Crestings; 21, Wrought Metal-work; 22, Cast Metal-work; 23, Carving; 24, Studies from Nature; 25, Flat Ornament; 26, Coloured Decoration; 27, Colour-patterns; 28, Floors (Mosaic, Tile, Incised, and Parquet); 29, Pattern Glazing and Grisaille; 30, Glazing with Figure-subjects; 31, Church Fittings; 32, School Fittings; 33, Pulpits; 34, Fonts; 35, Organs; 36, Screens; 37, Bench Ends; 38, Gates and Fences; 39, Sundries. In this way the architect can classify the details which he is most frequently concerned with. Drawings of existing work, whether old or new, will be added, as they arrive, to the collections they pertain to. Amongst these, in the proper places, the owner may put the details of his own buildings. Years after such drawings have been worked from, they have much to teach, especially to their originator and designer. Here he will note that he failed—there, again, that to some extent he succeeded. In one place, perhaps, he found his details, when worked from, too small and delicate; in another, too bold and coarse. All these things he notes on the drawings, after being impressed by them at the building, in the hope of doing better next time; and now and then, perhaps, he sees in one of his earlier ideas the germ of something which might have beauty and freshness. In this way the man who means to make

progress is for ever criticising and correcting what he has done; and by the sort of arrangement this article is meant to suggest, this criticism and correction become so easy as to be almost self-acting.

To the architect proper, “professional practice” may be the least attractive division of the five. But it is none the less indispensable. Everybody, in going through life, has to do a share, and sometimes a very large share, of drudgery, and architects may congratulate themselves that the drudgery, in their case, is relieved by so much that is agreeable. The portfolios in this division may begin with the Acts of Parliament and local regulations. These last, in a practice which includes many provincial towns, will soon increase till they form a little library of their own. Except when one's work happens to be immediately affected by them, they form dreary reading; yet there is one way of looking at them which suggests curious reflections.

If we compare the local regulations of various towns, it is strange to see how widely they differ. In one place, all that the inhabitants seem to be afraid of is fire. They scarcely trouble about drains and sanitary matters. To die peaceably in their beds does not alarm them, but they strongly object to have their houses burnt over their heads. In another place, equally crowded, fire seems to be looked upon as a very trifling evil. Sanitation is everything, and there is little care taken to avoid a wholesale conflagration. So it is in other matters. One might suppose that nearly the same precautions against well-known dangers would be required all over the kingdom. But, whether required or not, the law does not insist on them everywhere. It insists on one thing here and another thing there. There is a popular demand for building regulations, and as long as people get rules and orders of some kind, they seem to be satisfied. It is the pleasure of being controlled, apparently, that they wish for, and whether the control does much good or little, seems to be only a secondary question with them.

“Professional Practice” may go on in portfolio 2 to include law reports relating to buildings, to architects' charges, and other such matters. Portfolio 3 may contain Conditions of Contract, Forms of Agreement, &c. No. 4 may be occupied with information about Light and Air cases, No. 5 with Dilapidations, No. 6 with Drains and Sewers, No. 7 with Ventilation, No. 8 with Heating, and No. 9 with Road-making and the Laying-out of Estates. No. 10 will contain the sundries which cannot be brought under any of the previous heads. The five main divisions will thus comprise altogether about 115 cases. But a reference library of detached articles, drawings, and memoranda may very well be begun with only two or three dozen portfolios. If it is found useful they will increase in number, and may finally constitute the parts of a much more elaborate scheme than the one which we have now attempted to sketch out.

THE OWNERSHIP AND RETURN OF DRAWINGS.

THE question of the ownership of drawings made by the architect has been by this time pretty well discussed, and the obligation of the architect to hand them over to the client should he claim them has been, at least legally, established—the custom of the profession notwithstanding. Yet there are many in practice who seem to be unwilling to abide by the decisions, who either refuse to deliver up the drawings, or do so with a bad grace. But there is another question often quite as perplexing and confusing, and even of more frequent occurrence, and that is the property of drawings furnished to builders, tradesmen, clerks of works, and

others requiring them. Is the builder justified in refusing to return the drawings or tracings after the work has been carried out? And what is his legal right in objecting to give them up? With regard to the first question, the client's right to the possession of the drawings, it is unnecessary to state again the dictum of the Lord Chief Baron of the Court of Exchequer, concurred in by the late Baron Bramwell and others in the case of "*Ebdy v. McGowan*," which was tried in 1870. That dictum declared that if there was no provision to retain plans and specifications, the architect had no right to them. The custom or usage amongst architects was, it was thought, unreasonable, if it existed, which Baron Bramwell thought was impossible, and, in fact, said was "perfectly suicidal." His Lordship, in fact, said such "a usage cut its own throat with its own absurdity," and contended there was no such usage. The claim made by the late Mr. Ayrton against the late E. M. Barry, R.A., for the drawings of the Houses of Parliament prepared by himself and his father, may be remembered also as one that went right against the architectural conscience. In the year 1871 the Council of the Institute obtained the opinion of two lawyers—Mr. Justice Manisty and Lord Justice Bowen—on certain questions drawn up by a committee, and this opinion clearly affirmed the principle of the above decisions. Mr. Wyatt Papworth, in a recent number of the R.I.B.A. *Journal*, publishes this opinion, to which we now refer. In answer to questions 1 and 2, the opinion was "that in the absence of express provision to the contrary, all plans and drawings which are prepared by an architect in the ordinary course of, and as incidental to, his employment as architect, are paid for by and belong to the employer both where the projected building is and where it is not carried out." The italics are ours. As to the question of alleged custom to retain plans, the opinion is equally important. It declared that such custom "seems to us to amount to no more than a very general practice to that effect," and falls "very far short of evidence sufficient to prove a custom binding upon all persons who employ an architect in the ordinary way," and they express a strong opinion that no such custom could be established. It is further given as their opinion that supplementary detail drawings stand upon the same footing, the architect being paid for making all such drawings as are reasonably necessary. From a legal point of view, therefore, the decisions have been against architects retaining their plans and drawings.

As to the second question, whether the builder has a right to retain drawings or tracings supplied to him by the architect for use in carrying out the building, there appears to be a difficulty, as builders have sometimes refused to part with these documents, contending they have been furnished for their own use, and that they form a part of the contract. We may suppose a case. An architect wishes to examine for some purpose the copy of plan supplied to the builder, it may be to compare with his original in case of a misunderstanding, and he requests a return of the plan, or he wishes to give the builder another plan. The builder refuses, saying the copy he has represents the work he undertook to perform. A similar refusal may be made by a manufacturer or special artist to return the designs or detail drawings sent to him after the execution of the work. Both builder and manufacturer may reply that the drawings supplied are their own, or, at any rate, the employers have more right to them. The law in these cases is doubtful, though the ruling of the courts certainly imply that all drawings, whether original or copies, belong to the employer. An architect generally makes a duplicate set

of drawings: one of these, the original contract set, he keeps himself as evidence of the contract, as showing what work was agreed to when the contract was signed. Sometimes when a board is one of the contracting parties, the solicitor or clerk is the custodian, but the practice is not a common one. These drawings and specifications which form part of the contract must certainly be preserved intact, so that neither party may alter or tamper with them; they are retained for reference and for safe keeping. Copies or tracings of these drawings are next made, one set for the builder, another for the clerk of works, and sometimes a third for the quantity surveyor, or the latter supplies the builder with a set of tracings. Various detail drawings and designs are made for sub-contractors and special artists engaged. After the execution of the works these several tracings and details ought properly to be returned to the architect; but in many instances they are retained in the possession of the several parties, and if application is made for them, they are refused, or the answer is they are worn out or lost. The architect has only one resource open—to summons the party; but this is seldom resorted to. Now the effect of this refusal to yield up the drawings and details after the completion of the work is that the plans and designs may be used in other works. Clerks of works and surveyors, too, have sometimes been unscrupulous enough to use the designs and details, or to profit by them in some way. We know of one clerk of works who was in the habit of offering old working drawings to those who were willing to purchase them, and every practitioner knows how often his details, especially mouldings, are re-used. Manufacturers also keep a stock of designs by them, and frequently show them to other customers as testimonials of their employment by well-known architects. Again, a builder who keeps his drawings may perchance find them of value at some future day, when alterations or additions have to be made; their possession may at least be of profit to him.

The right of property in their designs and details can be retained by architects if they provide for it in the contract conditions, or make a special proviso in some other way. No merely formal affirmations of the profession have the slightest effect in law. For example, the Institute, in a resolution passed by its Council, affirmed that drawings furnished to builders and others are only supplied for the purpose of executing the work, and are not in any sense the property of the builder, and he ought in all cases to return the drawings and any copies of the same he had made for his own convenience. As an expression of opinion, only for the guidance of their own members, such a resolution may be useful, as in the other professional declarations made as to fees, &c.; but they are absolutely powerless to bind the builder or the client, unless he agrees to the condition. The same may be said of trade-union rules, which are not binding on the employer. No body of professional men can make laws for other people; but they can make agreements with their clients. Several architects are in the habit of writing on every tracing or drawing that leaves their offices: "This drawing is the property of the architect, and is to be returned to him on the completion of the works." If words to this effect were written or printed and affixed to every tracing and drawing which left the office the difficulty to which we have referred would be obviated. Builders would begin to learn the conditions under which they received drawings. As to the return of copies made by builders themselves, of course very little can be done, except to rely upon the good faith of the recipient. Clients often require to see plans if they contemplate making alterations or to

discover the course of drains, and there is no doubt the architect may be legally called upon to permit his client access to them. The question has, however, never been authoritatively determined.

All the trouble that has arisen between employers and architects in respect to the ownership of drawings is the result of the very strong and mistaken idea entertained by the public that the architect's plans and designs are the goods which are purchased by the commission. Instead of being regarded as merely the instruments or means employed by the architect in carrying out the building, they are looked upon as the actual work or service rendered. The profession have to try and eradicate this notion of their function, to endeavour to show that the paper design or plans are equivalent to the written prescription of the physician, and nothing more. The physician is consulted to cure a malady or restore health, and whatever means he uses to accomplish his purpose is immaterial to the patient; so the architect is consulted to design and carry into execution a building, and to this end he is obliged to represent his ideas on paper, in much the same way as the physician is obliged to write a prescription of the treatment or drugs required. Both have to use certain means or instruments. It is true a prescription is sometimes lent or given to a friend; but such a practice is, to say the least, dangerous, and the lender must have a fool for a patient. The plans of a house prepared by an architect are, similarly, like the prescriptions prepared under special conditions and circumstances. The professional adviser in each case has a substantial reason for repudiating any such transference or re-use of his opinion, and on this ground alone the architect is justified in requiring the return of plans which may be re-used to his disadvantage. A prescription is a two-edged sword, and may kill or cure, and therefore its value is only to its owner; but the architect's design is regarded in the light of a valuable commodity that is paid for, and may be bartered or lent whenever occasion offers.

The retention of drawings and the return of those furnished to builders and others must be made a matter of special contract if the profession desire to protect their interest and to prevent the practice of making use of designs which are intended for only certain positions and purposes. Even in the case of perspective views, which are not prepared for contract use, an understanding is necessary to avoid after-disagreement.

INCOMBUSTIBLE CONSTRUCTION.

WITH all our boasted advancement in the science of construction, it cannot be said that we have done much to render our buildings less inflammable. On the contrary, though the Building Acts of the Metropolis have been framed mainly to reduce the risks of fire, they have practically only insured a fire-resisting case of brick or stone, leaving the interior—a mass of combustible material—at the mercy of builders without any efficient safeguards. The present Act, as far as the Metropolis is concerned, has not touched the vital points to be observed in insuring the safety of those who work in, or inhabit, buildings against the untiring foe which is always present in one form or another, and which is ever ready when not under control to become supreme master. Everything that can be done to check the beginning of fire ought to be adopted. One would expect also that all means of escape and communication between one part of a large building and another would be protected by resisting and incombustible materials; but, strange to say, these are the very portions of most buildings, dwellings

especially, which are of the most combustible and temporary character. Internal partitions, those dividing passages and corridors from rooms, are often of wood, the staircase which ascends to the top story is of wood, and, worst of all, they are hollow-built, match-boarded construction which invites ignition and rapid combustion. Massive and solid timbering has resisted the spread of flames; but the modern casing and hollow partition have become a too ready prey, by reason of the currents of air which can penetrate them so easily. In short, it is not only because our modern buildings are constructed of wood, but because of the manner they are constructed, that we so repeatedly have to chronicle cases of outbreak of an alarming and heartrending kind. Two fires that occurred on Monday last, one in Montague-place, Bedford-square, and the other in the neighbourhood of Commercial-road East, draw the attention again to the extreme danger of unprotected and unsafe staircases in houses of several stories. In the Montague-place disaster the premises were used as a boarding-house, and were, in fact, two houses converted into one, having no fewer than 43 inmates at the time of the outbreak. The fire broke out at the back of the ground floor, and soon involved the stone staircase ascending from it to the second floor. One or two hairbreadth escapes are recorded, owing to the sudden and early collapse of the upper part of the stone staircase, which had been exposed to the heat of the flames a few moments, thus cutting off the descent of three ladies who were rescued at the peril of their lives by the courage of the firemen. In the second instance the three-story house was tenanted by four families. The flames originated in the ground floor front room, and the wooden staircase taking fire cut off the escape of those who were asleep in the upper floors, who had to jump from the windows at the imminent peril of their lives.

We have here the record of two fires on the same day in which the staircases were so quickly involved that escape by them was impossible. And, what is necessary to remark, one was of stone, the other of wood. No doubt the builders of the well and substantially-constructed houses in Bloomsbury erected stone staircases under a sense of the greater security they afforded, and this is still the opinion of many people who imagine a stone staircase insures at least a safe retreat in case of fire. This belief has been shaken unhappily only too often. The treacherousness of limestone, such as Portland, to suddenly give way under heat is known to all firemen, and Sir E. M. Shaw has warned the public of the danger and uncertainty of stone when exposed to heat. A wooden staircase gives often a timely warning by the crackling and smoke; but a stone one does not. It flies to pieces and calcines into powder, as ample evidences have shown us in the notable case of the new front of Foster's premises in Cheapside, a few years ago. Still architects use stone in good houses in preference to other materials. Have not all our large public buildings and private mansions stone staircases of the same kind as that in Montague-place? And would it be tolerable to introduce anything else but real stone? The answer to these questions is that natural stone should be only used in staircases round which incombustible walls and floors are employed, and not when timber forms a large part of the interior construction. With these combustible materials some form of concrete stairs ought to be used, incasing walls of brick being the only safe construction in connection with buildings of fireproof material.

The wooden staircase constructed of treads and risers upon strings of the close or bracket form, are always dangerous, more particularly when they are continuous and have an open well, which becomes a veritable

furnace-shaft in case of fire. Solid wooden steps resting upon brick walls would resist fire for a considerable time, and so would hollow stairs filled in with concrete or asbestos—a plan that ought to be followed in every building of more than two stories.

The frequent calamitous fires due to the inadequate rules of the Building Acts in London in these particulars ought to lead to a revision of the sections applying to fireproof construction. The present system of hollow floors, partitions, and stairs ought to be abolished, and a plan of filling in solid with fireproof material be made to take its place, in all buildings of several stories used as dwelling-houses, shops, and warehouses. The proposed amendments to the London Building Law (Consolidation) Bill provide for an opening or trap-door on the roof as a means of escape, and that every staircase for the use of the public shall be supported and inclosed by brick walls not less than 9in. thick; section 22 provides that every building of more than 125,000c.ft. used as a dwelling for separate families shall have stairs, lobbies, and corridors of stone or other fireproof material. These rules do not apply to the thousands of old houses converted into boarding-houses, or to ordinary dwelling-houses of smaller capacity let for lodgings, such as many in Bloomsbury and other parts of London. The wooden partition forms a large part of the interior of many of these; bedrooms have been divided by match-boarded partitions and there is no means of escape. The modern dwelling-house is all wooden partitions; the stairs are constructed of the lightest deal, and the lower flights are encased on the lower story, and inclosed by a matchboarded spandrel. What is to prevent a fire in a closet under the stairs igniting the staircase? Again, the hollow wooden-studded partition is on one side of the staircase, and is carried up to the top floor. A fire occurs in a lower room by the upsetting of a lamp, the partition becomes ignited, and the draught through the studs between the plastering communicates directly with the floor above, which is soon involved—thus the fire spreads from floor to floor. Now this communication may be cut off by filling-in the partitions with a fireproof material, or by filling-in the space of each above and below each floor, so as to prevent draught and check the spread of the flames to the flooring. As at present constructed, the open partition forms a communicating flue of the greatest danger. There is nothing in the Metropolitan Building Act to compel the builder to provide any check. In New York the recent regulations require not only stairs and landings to be built of incombustible materials, but that no woodwork is to be used in any of the partitions, furrings, or ceilings, the door and window-frames and casings being filled solid at the back with fireproof material. Any revisions of the Building Act that may be made ought certainly to prohibit hollow wooden construction, and to provide some checks to the rapid spread of fire, and to this end attention should be drawn to the absolute necessity of making partitions and open-cased structures, like stairs, solid by the use of suitable material as a filling, on the principle that wherever there is a passage for air there is the risk of flame.

STABILITY OF WALLS ON SOILS.—V.

Equilibrium as a Principle of Stability.

IN the textbooks on physics three different states of equilibrium are defined depending on the relative positions of the centre of gravity and the centre of support, or on the property of rigidity combined with a favourable disposition of the form of the rolling or bearing surface of the object to assume rest or motion. The centre of gravity of a body or mass tends incessantly to occupy the lowest possible position, and hence the distinction, "stable," "unstable," and

"neutral" equilibriums are made in relation to the modes by which stability is attained or affected. In "stable" equilibrium the body always tends to return to its first position after the equilibrium has been disturbed. The centre of gravity may be either above or below the centre of support. Ordinarily architectural buildings do not come under this class, for although tall chimneys rock or sway with fierce winds, due to elasticity of the upper masonry, the disturbance of the centre of gravity thereby is unappreciable. "Unstable" equilibrium is the state existing when after a slight disturbance the body tends to depart still more from its original position; the centre of gravity is vertically above the centre of support. Buildings supported on compressible soils would act in this manner. "Neutral" equilibrium has the centre of gravity above the point of support, such as a globe or a cone lying on its side on a level plane. A familiar illustration of the three kinds of equilibrium is a cone placed on a horizontal plane: 1, on its base, it is in "stable" equilibrium; 2, balanced on its apex, it is in "unstable" equilibrium; 3, placed on its side, it is in "neutral" equilibrium.

The conditions on which equilibrium depend are—1. The lines of action of all the forces must have their resultants in the same line. 2. There must be equal forces acting in opposite directions along this common line of action—i.e., action and reaction are equal, and in opposite directions. 3. The points of application of force may be anywhere along the common line of action, and therefore the sums of any number of forces in the same line of action in opposite directions must be equal.

In structural practice if this line of action is represented by several stories of columns in one continuous vertical line, the loads of the several floors transmitted by the girders should be applied or imposed so as to act along the continuous axis of the columns. This frequently can only be effected by so skillfully arranging the points of support centrally that the girder loads on one side will be balanced by having corresponding girder loads on the opposite side, otherwise there would be eccentric loading that induces excessive cross strains, which, to meet adequately, would be at variance with economy.

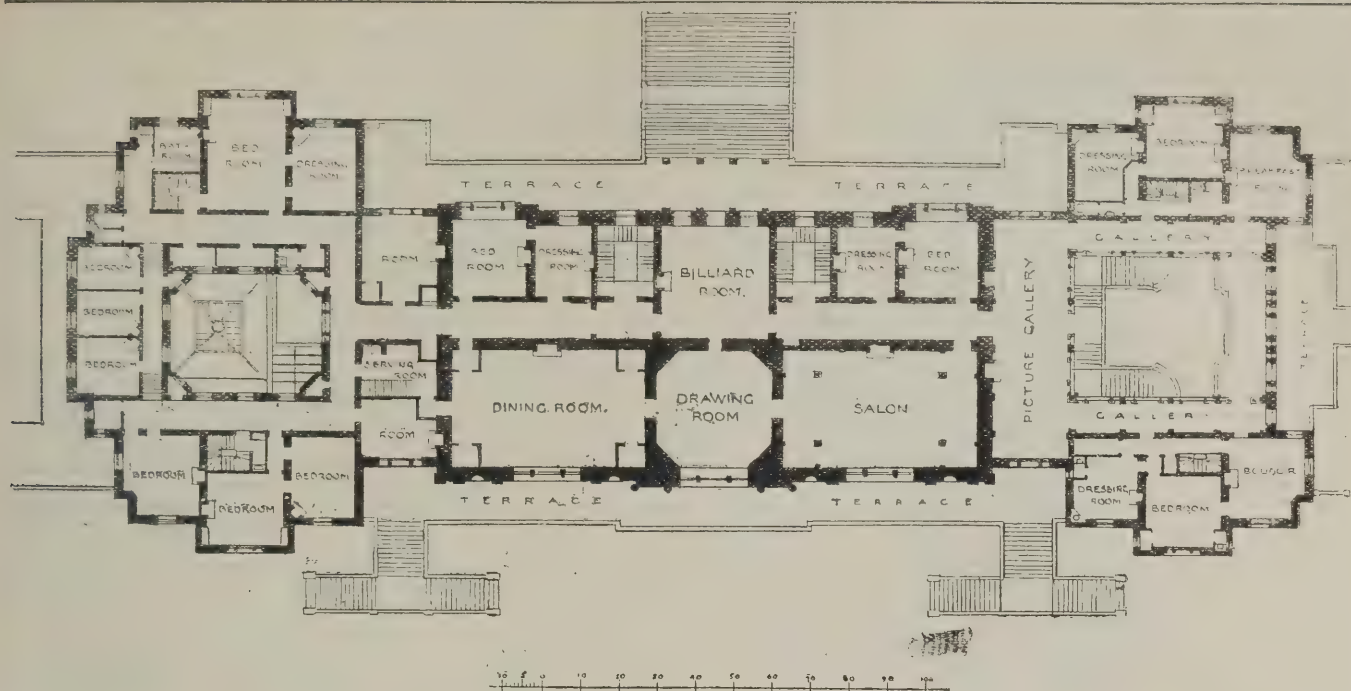
Conditions of Equilibrium of Forces.—The principles of equilibrium imply that all forces causing or tending to produce disturbance or change of position, or deformation of parts, or of the whole, are fully and effectually resisted by a corresponding system of opposing forces, whether effected by ample dimensions of parts, adequacy of their disposition, or massiveness of materials, and of the medium or matter producing resistance. The action of force in tending to produce displacements or deformation depends upon (1) the favourable position of the point of application of the force to create static couples; (2) on the favourable direction in which its action tends to produce disturbance by enlarging the moment of the couples; (3) upon its amount or magnitude, or surplus magnitude, in relation to that of the opposing forces, or moments of matter.

It is, therefore, the duty of the designer to effectually resist all these displacing forces, and his skill is displayed in effecting this in the most direct and economical manner, by the most adaptable scientific system of concentrating the loads and controlling the resultant forces so as to produce direct vertical action, and by making the supporting area concentric with the axis of loading.

Equilibrium in Structures.—Structures of all kinds are incessantly under the action of two or more opposing forces, or systems of forces, tending to cause motion or displacement of the whole or of parts of the structure in different directions, according to that of the surplus force.

The prime cause of motion or displacement in foundations is in neglecting to place the centre of action of opposing parallel forces directly opposite to each other, or in the same line of action, whereby a statical "couple" is constituted. The measure of the force of this couple is the magnitude of the active force. The moment of the couple is the product of the force by the length of its leverage arm, or the distance between the forces perpendicular to their lines of action.

The principal forces involved are those arising from the action of gravity, which is ever present, and the resisting strength of the constructive materials involved, the supporting power of the soil, &c.



GOSFORD HOUSE, N.B.: PLAN OF FIRST FLOOR.

Stability.—The stability of a structure depends on the equilibrium of its parts and masses, on its centre of gravity being effectually supported. This support may be either by direct vertical interposition of solid materials, or by means of abutting support, which may be obtained by the interposition of beams, girders, cantilevers, or other sustaining transverse structure, which transfers the weight of the superstructure to the abutments or imposts, piers, &c.

In all cases, the centre of gravity must fall sufficiently far within the edges of the base, so that the pressures will not rupture the materials of the base near its edges.

In all pressures that are not vertical there will be a vertical component in its action upon the structure. Thus, though the normal action of wind is horizontal, yet in its tending to overturn the structure, it produces a vertical component on the foundations which must be provided against. The differences in the distance of the common fulcrum from the vertical and horizontal centres of application of pressures,—say that of wind upon the geometrical centre of a high tower, and its resultant action upon the foundations and upon the underlying soil, determine the relative intensities of the pressures.

The resultant of an equally-distributed pressure like that of wind is assumed to act at, or near, the geometrical centre of the surface of exposure, and its leverage of action is the height of this point above the footing base; the leverage of resistance is half the width of the foundation base.

Conditions of Equilibrium of Buildings upon Foundation Soils.—The conditions which regulate the static equilibrium of buildings upon their foundation soils depend—1. Upon there being a safe reserve balance established between the gross load imposed on the soil by the building as a whole, and the safe sustaining power of the soil upon which it is imposed. This reserve is usually obtained by using a factor of safety of 3 to 5, according to the character of the building, &c. 2. It also depends on the subdivisions of the structure balancing each other, by a consistent distribution of the parts, and of similarity of forms of adjacent supporting bases. 3. That the forces and resistances exerted by and upon each part of the structure shall balance each other, so that horizontal or oblique thrust shall not be exerted unrestrictedly against the foundation soil base, such as when the resultant line of thrust of an arch lies outside the base of an abutment tending to overturn it by depressing its heel, and that the resultant of the imposed forces of the structure shall be equal and directly opposite to the resultant of the reactions of the sustaining forces of its foundations.

Conditions of Permanence of Stability.—The conditions which will insure permanence of stability are very important, and may be regarded in a twofold aspect—1. Sufficiency of the design and of the details throughout, and likewise of

the workmanship. 2. The durability and appropriateness of the materials in their proper places, and adequacy of protection of the less permanent materials.

Note.—It is implied in 1 that there is the power of a skilful determination and economical selection of the appropriate materials—i.e., those which are best adapted by their special or general properties for each part of, and position in, a building; and it is implied in 2 that there is the practical qualification of personally judging of their precise grades and qualities, not so much by their trade marks or commercial brands, as by personally recognising the absolute fitness in all their physical or chemical peculiarities to best serve their precise purpose in the structure.

For the latter purpose in relation to building stone, Prof. Beare's contribution, *BUILDING NEWS*, p. 628, Vol. LXII., furnishes eminently useful information: (1) In regard to the expansion and contraction of stone in masonry, due to changes of temperature, and the means thereby afforded of calculating the abnormal stresses thereby induced in piers, lintels, and other parts when they are made slender, and require a judicious reserve of strength. 2. Also information in regard to the absorptive power of different kinds of stone as an indication of their weathering qualities, and their liability to the solvent action of rain, and the destructive action of frost, and the resulting loss of strength by both of these agencies.

(To be continued.)

GOSFORD HOUSE, N.B.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

WE give Mr. William Young's Royal Academy drawing of this mansion, which was completed for the Earl of Wemyss a short time ago. A previous "new" mansion-house, designed by the brothers Adam, was finished in 1803, and the valuable collection of pictures belonging to the house of Wemyss was transferred from the old house—now demolished—to that building. Soon after the pictures had been hung in their new quarters, however, an apprehension arose that the building was damp, and the collection was removed again to the old house, and the new mansion, partially demolished, remained tenantless. It is this building which Lord Wemyss has restored into a palatial mansion. We give plans of the enlarged house with the view. In addition to the internal reconstruction of the central portion of the original building which remained, wings have been added on the north and south ends. At the south end of the building, which, including the wings, is in length 341ft., is an entrance courtyard inclosed by an ashlar-pannelled and pilastered stone wall, corresponding with the architecture of the house, and there is a similar courtyard on the north side,

known as the kitchen courtyard. The ground-floor story is of rustic stonework, and on the west and east, to the sea and garden fronts of the original building, is an arcading of a similar character extending about 10ft. from the old walls, and forming a piazza on the ground level, and on the principal floor a broad terrace connecting the two wings. From this terrace, to which the principal rooms open, charming views are obtained westward of the Firth of Forth as far as the Forth Bridge, while on the east side there are delightful vistas of the gardens and ponds which are a feature of Gosford policies. In the centre of the latter front is a grand flight of stairs, 38ft. in length, giving access to the gardens. The exterior of the sea-front of the central building is treated as a Corinthian order, extending the whole length of the wall above the terraces, with double pilasters at the ends, and engaged columns in the centre. Between are large arched windows, with a minor ordnance of the Ionic order. In the centre is a pediment, over which, springing from an octagonal base, rises a dome, the outlines of which must be familiar to all who have enjoyed the view of Aberlady Bay from the Calton Hill, of Edinburgh. The Ionic order is carried through the new wings, which have broken and picturesque outline, and the design adopted is such as to give to the whole composition a pyramidal form. The entrance is at the southern end of the house from the main avenue, and through a court inclosed by ashlar walls, designed in character with the architecture of the house. Passing through an outer hall—in design quiet and simple—entrance is obtained to the magnificent staircase hall, which is the feature of the interior of the mansion-house. The lower story of the hall is surrounded by solid walls, panelled in Caen stone and alabaster—broken only by three doorways with alabaster architraves and over-doors, and two niches for life-sized figures. On this wall for a base rises an arcading of alabaster and Caen stone, which extends around the four sides of the first floor. Facing the entrance door is an oval baluster arch, resting on similar clustered columns and pilasters. A double marble staircase, starting on each side of the hall, is carried over this arch—in treatment not unlike the Rialto Arch at Venice—and meets in the centre, while inside the arch is a fine Italian chimney-piece in Istrian stone. The balustrade which extends up the staircase and continues round the first floor is of alabaster, with base and capping in Caen stone. On the ground floor the hall is 38ft. by 48ft., but on the first floor it opens up by the arcading—behind which extends a corridor overlooking the hall—to 56ft. by 70ft., with a height of 45ft. from the floor to the centre of the dome. This arcading is formed by a Corinthian main order in Caen stone 20ft. high, each side being divided by pilasters into four bays, and the ends into three bays. Each

bay is again subdivided by a minor ordinance of the Ionic order into three, by a Venetian arch and side openings formed with alabaster columns, pilasters, archivolt, and inlaid alabaster spandrels. A rich entablature in Caen stone completes the arcade, and above this springs a bold cove panelled and enriched in canvas plaster work. The ceiling is thence brought into the form of a circular dome, all in enriched canvas plaster. The floor of the hall is of veined marble corresponding with the steps of the stairs, laid in geometrical patterns and surrounded by a border of rouge jasper marble. By the marble staircase is reached the principal floor (see plan on the preceding page), which contains the whole of the reception and living rooms, as well as the family bedrooms and most of the guests' rooms. The picture-gallery, which is first entered, is 63ft. long by 20ft. wide, and has a beautiful canvas plaster ceiling and three cupola lights. At each end of it there is an entrance to the corridor running round the staircase hall and overlooking it. From this corridor access is obtained to Lord and Lady Wemyss' apartments and other rooms, the south wing having been planned so as to form in itself a complete little house. From the picture gallery, again, a doorway opens into the corridor which extends from end to end of the central building and connects the wings. The sea or west front of this part of the house is occupied by three magnificent rooms, two stories in height—viz., the *salon* or library, 50ft. by 30ft.; octagonal drawing-room, 30ft. by 30ft.; and the dining-room, 50ft. by 30ft., and each 40ft. high. On the east side of the central position are two floors of bedrooms, and the north wing is also entirely devoted to bedroom accommodation. In the centre of the wing is an open court, the ground floor of which forms the kitchen, the remaining part of the wing being devoted to domestic offices.

A SANITARY CRUSADE THROUGH THE EAST AND AUSTRALASIA.—II.

(Continued from page 312.)

LEAVING the Malay Peninsula, Mr. Boyle proceeded to Siam, Bangkok—the capital, dubbed the “Venice of the East,” being the first place visited. This city, which has a population of about 400,000, a large proportion of whom are Chinese, is an exceedingly unhealthy place, where cholera, which is never absent, carries off thousands of the inhabitants annually, to say nothing of the victims of small-pox and other fevers and diseases which make Bangkok their home.

The foul water which the people drink is chiefly responsible for this terrible mortality, the city being intersected by canals or creeks which run into the river Menam, and which are in a partially stagnant state. The excreta and all the filth and refuse of the town are deposited in these creeks, the water of which the inhabitants use for drinking and cooking purposes, and which is in such an impure state, being practically nothing but liquid sewage, that the stench arising from it is quite overpowering. The water of the Menam is also very poisonous, and contains poisonous fish and reptiles to such an extent that it is positively injurious to even take a bath in water drawn from the river.

Mr. Boyle has seen several cholera and small-pox epidemics in the East, and as instances of the utter want of precaution and indifference of the people, he has observed natives stricken with the cholera lying in the streets totally uncared for, and the cholera carts followed by numbers of children, who, from their laughter, seemed to think the ghastly work highly amusing. It is also a common thing, especially in China, for small-pox patients to walk about the town with the disease full upon them, and as the streets are usually narrow and crowded, it is next to impossible to avoid contact with them.

The mode of disposing of the dead in Bangkok is of a somewhat rough-and-ready description. Cremation is the method adopted. When a person dies the body is conveyed to a burning Wat or temple, where for a small sum sufficient firewood is provided to consume it; but when it happens that the relatives have not got the required amount the body is simply deposited on the ground and left there. Hundreds of bodies may be seen at any time in the temple inclosure lying about in heaps in every stage of decomposition and decay, and from which a most sickening odour arises. As many are the bodies of

persons who have died of cholera, small-pox, and other infectious diseases, it will be readily understood that these pest-spots form an important factor in the death-rate of the city. In striking contrast to this disgraceful state of affairs, the palace of the king, standing within its fortified inclosure, is a perfect model of cleanliness and order, and the royal Wats or temples are amongst the finest in the East, and kept in perfect preservation. To see these temples alone would well repay a visit to Bangkok, as they are perfect gems of art, and there is nothing like them to be seen anywhere else in the East, not even in India, that country of magnificent temples.

Mr. Boyle made a survey of the palace, and has furnished plans for the application of his system of ventilation to it. One of the largest figures of Buddha in the world is to be seen at Bangkok; it is recumbent, and measures about 170ft. in length by 50ft. at the shoulders, and is inclosed in a magnificent temple. There are a number of very handsome public buildings in Bangkok, built in European styles of architecture, chiefly Italian. There is cable connection with the city, and the telegraph and telephone are in general use; tramcars run in the principal streets, and electric lighting has been introduced.

Two lines of railway are at present in course of construction—one from Bangkok to Paknam, at the mouth of the Menam, a distance of 30 miles; and the other up country to Korat *via* Ayuthia, the ancient capital of Siam. This line will be about 130 miles long, and will be of great value in opening up the country and aiding the progress of civilisation in Siam, which has a mixed population of eight millions; but, like the Chinese, the people are very much opposed to innovations of any kind. During Mr. Boyle's visit, the first sod of the Korat Railway was cut by the King, and a very grand ceremony it was, and a magnificent display of barbaric splendour.

Borneo, which, after Australia, is the largest island in the world—New Guinea ranking third—was the next country visited by Mr. Boyle. It is very sparsely inhabited, the total population being under 3,000,000, the greater part of the country being covered with almost impenetrable jungle. The native Dyaks are a very savage race, their chief recreation being head-hunting, and he who can show the greatest number of heads decorating his hut is considered the greatest man. Mr. Boyle had the privilege of witnessing a party of Dyaks performing their war dance, and a very wild and fantastic scene it was, as the moonlight shone in fitful gleams through the dense jungle growth, lighting up the naked bodies of the savages as they whirled their phrangs or war-swords round their heads and brandished their shields, covered with tufts of human hair, each tuft representing a head, whilst the uncouth sounds from the reed instruments and drums produced an eerie and weird effect that was impressive, though somewhat startling.

The territory of Sarawak, on the north-west coast of Borneo, was acquired from the Sultan of Brunei in 1842 by Sir James Brooke, who assumed the title of Rajah of Sarawak, and which is held by the present Rajah, Sir Chas. Brooke, who has devoted himself to the development of his territory, closely guarding the interests of the natives, whom he will in no way allow to be exploited.

Kuching, the capital, situated on the Sarawak river, about twenty miles from its mouth, is a very handsome little town, containing several fine public buildings, including a very good hospital. The sanitary condition of the town is satisfactory, and it is considered a healthy place for Borneo. Sandakan, the chief trading centre in British North Borneo, has a magnificent harbour, but it cannot be called a healthy place, neither can Labuan, which seems to be gradually going down as a trading centre.

On many of the plantations all sanitary laws, so far as the coolies are concerned, seem to be entirely ignored, the consequences being an enormous sacrifice of human life. The wretched coolies are also treated worse than beasts, the most inadequate provision being made for their accommodation and subsistence, the result being in such a pestilential climate that they die off like flies. Things are at present at very low ebb in North Borneo, and many of the plantations have had to be closed.

From Borneo, Mr. Boyle proceeded to Java, a very beautiful and fertile island, having a population of about 21 millions. Batavia, the capital,

is a well-laid-out town, intersected, as in Holland, with canals, lined on each side with trees. There are several handsome public buildings, including the Government Buildings and the Museum, for the ventilation of which Mr. Boyle has submitted plans. Batavia was long noted for its extreme unhealthiness, cholera carrying off thousands every year. Before the artesian wells were employed, the inhabitants used, for all purposes, the water of the river and canals, which receive, as at Bangkok, the whole of the excreta and refuse of the city. Batavia lies in the midst of swamps and jungles from which arise a poisonous malaria, which has a very injurious effect on the health of the people.

At Tanjong Priok, the landing-place, six miles from Batavia, and connected by rail, the miasma arising from the mangrove swamps is so dense at night, as to completely enshroud the place, and it has a very sickening and disgusting odour. This is the most feverish spot in all Java, and few can stay a night there with impunity, as Mr. Boyle found to his cost, he having contracted the fever there, but which, we are glad to say, he has since entirely got rid of. Railways traverse the principal parts of Java, and the Dutch have shown considerable enterprise and judgment in developing the resources of the country, which, so far as the government of it and its prosperity are concerned, is a model colony.

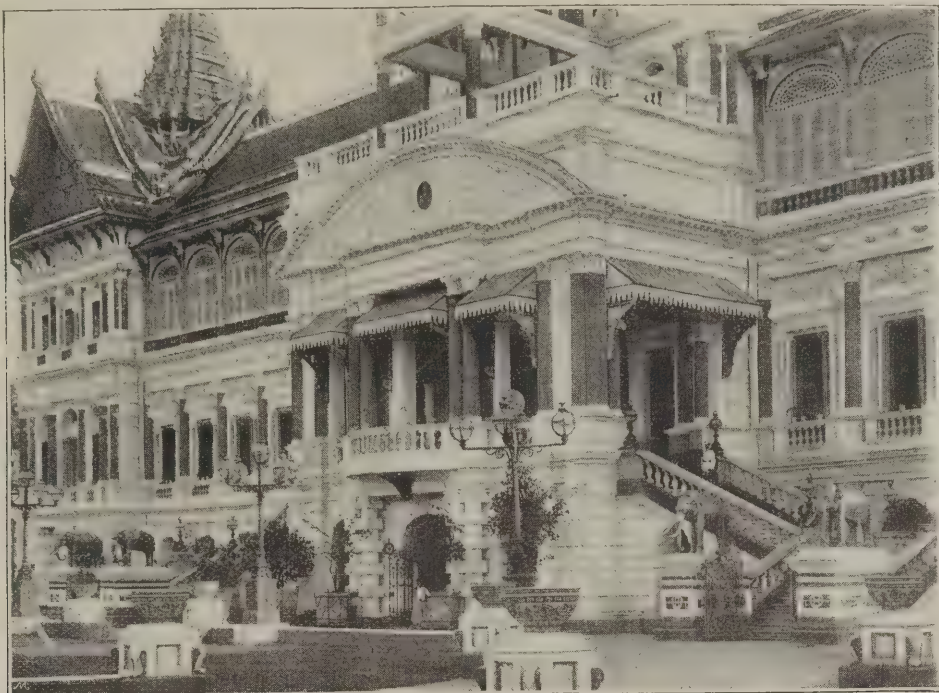
Leaving Java, Mr. Boyle proceeded to Australia, travelling through Queensland, which has now a population of about 400,000, made up of whites, Chinese, and natives. This colony, it is anticipated, will ultimately develop into one of the richest mineral fields in the world; but at present things are, as is indeed the case over the whole of Australia, rather depressed, though there is a tendency towards an improvement. Brisbane, the capital of Queensland, is a handsome and rising city, beautifully situated on the banks of the Brisbane river, about twenty-five miles from the sea, and has a population of about ninety thousand. It is considered a very healthy town, though hot in the summer, and the pure, dry air is found to be beneficial for pulmonary complaints. It contains a number of remarkably fine buildings, chiefly situated in Queen-street, the principal thoroughfare, some of which are from the designs of Mr. Richard Gaily, the President of the Queensland Institute of Architects, who has paid considerable attention to the important question of ventilation, and has furnished Mr. Boyle with the following valuable report as the result of his experience: “I know of no method equal to Boyle's system, and I am confident that its application to our public buildings would very much improve their ventilation.”

The Vice-President of the Institute, Mr. Henry Hunter, also reports, “I know of no system of ventilation so suitable to our requirements in this part of the world as yours,” which is endorsed by Vice-President Mr. Leslie G. Corrie, who says: “There are no systems of ventilation or ventilators with which I am acquainted which answer our manifold requirements so satisfactorily as do those bearing your name.”

The Houses of Parliament, new Treasury buildings, and the Supreme Courts are very fine specimens of architecture, whilst the Banks and Insurance Offices are equal to any buildings of their kind in London, and are erected to the designs of, amongst other architects, Mr. G. W. Addison, who, writing Mr. Boyle *re* the manufacture of his appliances in Australia, says, “With your world-wide reputation you can almost command the market.” Messrs. Nicholson and Wright, architects, who have several important public buildings at present in hand, for which they have specified the Boyle system, also report, “We are quite convinced that your system of ventilation is the best.”

There is no system of sewerage at present in use in Brisbane, pail-closets being used; but as it is only compulsory to clean them out once a week, where the closet is inside the house, disagreeable smells are occasionally experienced. It is a regrettable fact that leprosy is increasing in certain parts of Queensland to an alarming extent; but stringent measures are being put in force to keep this terrible disease in check and stamp it out, which, if rigidly adhered to, may ultimately prove successful. Messrs. James Campbell and Son, Limited, Brisbane, have been appointed agents for Queensland.

Sydney was the next place visited, and Mr. Boyle was astounded at the progress this city had made since his first visit, seventeen years ago, it being then a quiet, sleepy old town;



KING OF SIAM'S PALACE, BANGKOK.

now it has doubled its size, and was, even though the times are quiet, all life and bustle. The immense and palatial buildings which line the principal streets, George-street and Pitt-street, from end to end, put one very much in mind of Chicago.

The population, including the suburbs, is about 300,000, and it is within the bounds of possibility, from the great strides that it is making, that Sydney, at no distant date, may equal Melbourne itself. Very special attention has been paid to the sanitation of the town, the most improved system of sewerage being in use. The Water and Sewerage Board make it compulsory for every house-drain and soil-pipe to be ventilated with approved ventilators, and Mr. Smail, the engineer to the board, one of the highest sanitary authorities in the colony, has spared no efforts to make Sydney practically realise Dr. Richardson's "Hygeia" or "City of Health." Mr. Smail instituted lengthened experiments with a view to test the exhausting power of the different ventilators submitted, but like the experiments carried out by the Sanitary Institute at Kew, the results were of an inconclusive nature, for though the majority of the ventilators were found to be better exhausts than a plain open pipe, yet when tested against each other in certain situations, conflicting results would be obtained when tried in other positions, though in each case the ventilators were fixed clear of all external obstructions. These tests afford an additional proof that it is impossible to correctly ascertain the comparative exhaustive power of different ventilators, especially when of a small size, by simply placing them on the tops of pipes in certain situations, and testing them with an anemometer or the water test, and they endorse the results which have invariably been obtained from similar experiments carried out at different times in this country. There is at present being practically tried in a suburb of Sydney a system of sewer and drain ventilation perfected by Inspector McKenzie of the Sewerage department, consisting of a series of furnaces which create downward currents into and through the sewers, drains, and soil-pipes, and also consume the sewer gases. It is the most perfect application of this method of sewer ventilation that Mr. Boyle has yet seen, and the result of the experiment will be watched with interest, and if successful it is to be hoped that the mere question of cost will not stand in the way of its adoption, though it must be confessed that this principle where tried in England has never given satisfactory results.

One of the most imposing structures in Sydney is the new Australia Hotel, erected to the designs of Mr. G. Allan Mansfield, F.R.I.B.A., at a cost of a quarter of a million sterling. It is certainly

one of the finest hotels in the world, and contains all the latest sanitary improvements, including the air-pump ventilators, respecting which Mr. Mansfield writes Mr. Boyle: "The efficacy of the system of ventilation you have adopted is so well known that comment would be superfluous." The Municipal Buildings and the Centennial Hall form a very handsome pile facing George-street. This hall contains the largest organ in the world. Mr. Boyle was desired to furnish a scheme of ventilation respecting which the City Architect, Mr. Geo. McRae writes: "I shall be very pleased to recommend your ideas regarding the introduction of your system into the Centennial Hall." Mr. Boyle was also requested by the Government architect, Mr. Vernon, to make an examination of the Houses of Parliament, and submit a scheme of ventilation, which has been done. The air-pump ventilators are adopted for the new City Hospital, which, when completed, will cost £150,000, the new Theatre, Conservative Club, Public Library, Exchange, and other public buildings. Indeed, it seems as if the opinion expressed by Mr. J. E. Kemp, architect, is likely to be fully realised when he says: "I am sure that 'Boyle's system' will be universally specified by architects in the colony."

Messrs. Scott, Sibbald and Co., Sydney, have been appointed agents for New South Wales.

DOMESTIC SANITARY APPLIANCES.

MESSRS. ADAMS AND CO.'S new Catalogue (sanitary section) embraces the special appliances required for domestic sanitation, dealing particularly with the trough flushing closet and its modification, the improved latrine, and lavatory basins and fittings, and ordinary house w.c.'s with the waste-preventing cistern, great prominence being given to the flushing and cleaning of the house drains and connections, for which purpose the circular cast-iron flush tank, holding from 15 to 100 gallons, is especially designed. This tank is sunk into the ground and connected to the drain to be flushed. It is provided with a cast-iron lid and sunk dish and grating, upon which the house and other waste, as from a bath, &c., is discharged. Upon the tank becoming full, its immediate discharge through the automatic siphon takes place, and the thorough scouring of the drain results. With this apparatus the whole of the water is utilised for drain-flushing, none being first passed through to start the siphonic action. Where a less costly appliance is required, Adams's patent flushing gully is specially good; this is made in earthenware, the body of the gully holding a certain amount of liquid, from four to eight gallons, as desired.

This flusher does not act with a drop by drop feed, but depends for its start upon a slight increase of head of water, as when a basin, &c., is emptied into the sink, &c., the pipe from which is arranged to discharge over the gully stone. Bath and other wastes are also discharged over this stone, and its adoption enables a householder at a minimum cost to keep his drains in a thoroughly efficient order. The same gully makes, by connecting it to a latrine, a simple and most effective automatic w.c. The self-acting trough w.c. mentioned has been recently greatly improved. The trough in gutter as now made is a most important feature; the whole of the heavier matter sinks into this gutter, and the full force of the discharge from the flush tank is concentrated upon it; less water is thus used, the trough is more frequently scoured, and the cleansing power of the water thus expended is very great. This trough is also fitted where desired with a spray-pipe so arranged as to flush the back at time of discharge of tank.

The patent latrine is flushed out in the same way as the above, but instead of the continuous open trough, it is made of separate and distinct pans placed side by side, and connected together by 6in. pipes. This form gives greater decency and an equally good flushing power. It is more generally used for adult work, barracks, and higher grade schools. It is made in cream-enamelled as well as ordinary brown ware. This firm's lavatory basin for schools is made of strong brown ware, and also in cream and white. It is formed as a solid block of ware with a semi-circular front, and is supported upon a galvanised cast-iron standard. It is one of the best school lavatories made, and when fixed in conjunction with a glazed brick dado is a very marked improvement upon the ordinary run of lavatory basins. Messrs. Adams and Co. have lately patented a very useful appliance for the testing of house drains. It consists of a receptacle into which a special smoke rocket is placed and ignited. It is then closed up, and the flexible tube which is connected to the apparatus being inserted through any closet or other trap, the smoke is thus given off directly into the drain without the trouble or necessity of breaking the ground up for this purpose. The cost is small, and the apparatus of great utility, and should be in the hands of all interested in sanitary work. The same firm have recently patented an improvement upon their well-known flushing siphon for sewers. It was necessary with their earlier siphon that the feed should discharge immediately over the vent-pipe in this siphon. The best features of this siphon have been retained, and by a slight alteration of this vent-pipe it is so constructed that the tank may be supplied with water in any manner and at any point. The

siphon is thus more easy of adaptation than when depending upon a special feed for its supply. Messrs. Adams have recently rebuilt their premises at York, and have laid down additional plant to enable them to keep pace with the growing demand for their specialities, and to turn out their work in the best possible manner.

PRICES.*—XLV.

(All Trade Discounts have been taken off, and Profit added.)

IRONMONGER (continued).

SASH LIFTS, &c., fixed, including screws—		£	s.	d.
1 in. plain stamped brass	each	0	0	3½
1 in. ditto ditto	ditto	0	0	4
1 in. ditto strong	ditto	0	0	5
2 in. ditto ditto	ditto	0	0	5½
2 in. ditto ditto	ditto	0	0	7
Small cast brass	ditto	0	0	4
Medium ditto	ditto	0	0	5
Strong ditto	ditto	0	0	6½
Stamped double lift and pull	ditto	0	0	6
1 in. shell pattern lift	ditto	0	0	3½
1 in. ditto ditto	ditto	0	0	4
2 in. ditto ditto	ditto	0	0	5
Heavy cast Gothic design	ditto	0	0	7
Ditto large	ditto	0	0	9
Light, hinged, drop lift	ditto	0	0	7
Strong ditto ditto	ditto	0	0	9
Light lift and fastener	ditto	0	0	9
Strong ditto ditto	ditto	0	0	10½
3 in. ring lift (brass)	ditto	0	0	8½
3 in. ditto ditto	ditto	0	0	9
1 in. ditto ditto	ditto	0	0	4½
2 in. japanned iron flush lift	ditto	0	0	5½
3 in. ditto ditto	ditto	0	0	6
3 in. ditto ditto	ditto	0	0	6½
Stamped brass flush lift, not polished	ditto	0	0	8
3 in. cast polished brass	ditto	0	0	10½
2 in. plain brass ditto (dead)	ditto	0	0	9
3 in. ditto ditto	ditto	0	0	10
4 in. ditto ditto	ditto	0	0	11
4 in. ditto ditto	ditto	0	0	11
4 in. ditto ditto	ditto	0	0	13
4 in. ditto ditto	ditto	0	0	10
3 in. ditto ditto	ditto	0	0	10
3 in. ditto ditto	ditto	0	0	11
4 in. ditto ditto	ditto	0	0	13
4 in. ditto ditto	ditto	0	0	11
1 in. circular sunk lifts for long arm	ditto	0	0	4½
1 in. ditto ditto	ditto	0	0	5
1 in. ditto ditto	ditto	0	0	6
1 in. ditto ditto	ditto	0	0	5
BLIND CORD and Knot Holders, fixed—				
No. 6935 brass let in and screwed	each	0	0	2½
6992 ditto dead	ditto	0	0	4½
ditto polished ditto	ditto	0	0	5
7341 ditto ditto double	ditto	0	0	4½
CASEMENT FASTENERS, fixed—				
No. 657 malleable iron	each	0	0	6
658 brass ditto	ditto	0	0	7½
344 Gothic pattern, iron	ditto	0	0	7½
ditto ditto light brass	ditto	0	0	9
ditto ditto strong	ditto	0	0	11
ditto ditto extra strong	ditto	0	0	1½
330 Cockspur iron, with side plate	ditto	0	0	6
331 ditto brass ditto	ditto	0	0	1
650 ditto with plate in front (iron)	ditto	0	0	8½
651 ditto ditto ditto (brass)	ditto	0	0	2
ditto ditto large ditto	ditto	0	0	3
No. 352 malleable Berlin black	ditto	0	0	11
353 brass and good quality	ditto	0	0	1
Espagnolette fastener, strong, handsome	ditto	0	0	5
Ditto, rod ditto, in malleable iron Berlin black	ditto	0	0	9
ditto, rod, and 6ft. to 9ft. high	ditto	0	0	6
ditto, burnished brass, and strong, 6ft. long	ditto	1	0	0
Ditto ditto 7ft. long	ditto	1	3	6
Ditto ditto 8ft. long	ditto	1	6	6
Ditto ditto 9ft. long	ditto	1	9	9
3 in. ditto, add per foot	ditto	0	0	7
1 ditto ditto per foot	ditto	0	0	1
6ft. French casement bolt, all iron	ditto	0	5	6
7 ditto ditto	ditto	0	6	0
8 ditto ditto	ditto	0	6	6
6 ditto brass mounts	ditto	0	14	0
7 ditto ditto	ditto	0	15	0
8 ditto ditto	ditto	0	15	9
6 ditto all brass	ditto	1	10	0
7 ditto ditto	ditto	1	16	0
8 ditto ditto	ditto	2	0	0
Improved patent brass casement fastener, for fastening casements on face at top and bottom simultaneously, 6ft., painted rods	ditto	0	12	0
Above 6ft. ditto	ditto	0	13	3
Solid polished brass rods, extra	per foot	0	1	4
Fastener, extra	each	0	6	0
Iron rods, covered with brass, extra	per foot	0	1	1
These can be made with brass fasteners, extra	each	0	4	9
No. 656, ring handle, Gothic pattern, catch on face	ditto	0	2	2
CASEMENT STAYS, &c., fixed—				
6 in. wrought, twisted hook and eye	each	0	0	3
7 ditto ditto	ditto	0	0	3
8 ditto ditto	ditto	0	0	8
9 ditto ditto	ditto	0	0	4
10 ditto ditto	ditto	0	0	4
11 ditto ditto	ditto	0	0	4
12 ditto ditto	ditto	0	0	5

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9 in. wrought-iron japanned, with pin-holes and pin or plate		£	s.	d.
10 ditto ditto	ditto	0	0	6½
12 ditto ditto	ditto	0	0	7
14 ditto ditto	ditto	0	0	7½
16 ditto ditto	ditto	0	0	8
18 ditto ditto	ditto	0	0	8½
9 in. loose joint malleable	ditto	0	0	7
10 ditto ditto	ditto	0	0	7½
12 ditto ditto	ditto	0	0	8½
14 ditto ditto	ditto	0	0	9½
15 ditto ditto	ditto	0	0	9½
9 in. malleable japanned plated	ditto	0	1	1
10 ditto polished brass	ditto	0	1	7
9 in. double-jointed malleable japanned	ditto	0	0	9
10 ditto ditto	ditto	0	0	9½
12 ditto ditto	ditto	0	0	10
14 ditto ditto	ditto	0	0	11
15 ditto ditto	ditto	0	0	11
8 in. best wrought-iron japanned	ditto	0	0	9
9 ditto ditto	ditto	0	0	9½
10 ditto ditto	ditto	0	0	10
12 ditto ditto	ditto	0	0	10½
14 ditto ditto	ditto	0	0	11
16 ditto ditto	ditto	0	1	0
18 ditto ditto	ditto	0	1	3
9 in. sliding bar and pin-holes, bronze, iron, and brass mounts				
10 ditto ditto	ditto	0	1	0
12 ditto ditto	ditto	0	1	2
9 in. ditto, bronze malleable, and brass mounts				
10 ditto ditto	ditto	0	1	1
12 ditto ditto	ditto	0	1	3
14 ditto ditto	ditto	0	1	5½
9 in. all brass ditto	ditto	0	1	0
10 ditto ditto	ditto	0	1	10
12 ditto ditto	ditto	0	2	0
10 in. ditto, bronze, and with malleable iron mounts				
1 in. polished wedged stay of wrought iron, cased with thick brass—	ditto	0	2	3
12 ditto ditto	ditto	0	3	9
14 ditto ditto	ditto	0	5	6
18 ditto ditto	ditto	5	6	6
12 in. gun-metal ditto	ditto	0	4	6
14 ditto ditto	ditto	0	5	10
18 ditto ditto	ditto	0	7	6
10 in. Brown's improved lever casement stay of wrought iron, cased with polished brass and brass mounts				
12 ditto ditto	ditto	0	3	9
14 ditto ditto	ditto	0	4	2
10 ditto bronze and with malleable mounts	ditto	0	2	0
12 ditto ditto	ditto	0	2	3
8 in. jointed malleable stay	ditto	0	0	9
10 ditto ditto	ditto	0	0	9½
12 ditto ditto	ditto	0	0	10½
14 ditto ditto	ditto	0	0	11
6 in. quadrant stay, japanned iron				
8 ditto ditto ditto	ditto	0	0	7½
9 ditto ditto ditto	ditto	0	1	8
10 ditto ditto ditto	ditto	0	0	8½
12 ditto ditto ditto	ditto	0	0	9½
6 ditto ditto ditto	ditto	0	0	11
8 ditto ditto ditto	ditto	0	1	1
9 ditto ditto ditto	ditto	0	1	2
10 ditto ditto ditto	ditto	0	1	3
12 ditto ditto ditto	ditto	0	1	5½
18 in. wrought iron japanned greenhouse stay, with holes and pin				
21 ditto ditto	ditto	0	1	0
24 ditto ditto	ditto	0	1	4
27 ditto ditto	ditto	0	1	7½
30 ditto ditto	ditto	0	1	11
12 in. cast malleable and japanned				
15 ditto ditto ditto	ditto	0	1	2
18 ditto ditto ditto	ditto	0	1	2½
21 ditto ditto ditto	ditto	0	1	4½
24 ditto ditto ditto	ditto	0	1	6½
27 ditto ditto ditto	ditto	0	2	0
30 ditto ditto ditto	ditto	0	2	2
15 in. hinged malleable				
18 ditto ditto	ditto	0	1	6
21 ditto ditto	ditto	0	1	7
24 ditto ditto	ditto	0	1	9
27 ditto ditto	ditto	0	1	11
2 in. brass cabin hooks, light				
3 ditto ditto	ditto	0	0	7
4 ditto ditto	ditto	0	0	8
5 ditto ditto	ditto	0	0	9
6 ditto ditto	ditto	0	0	11
7 ditto ditto	ditto	0	1	1
8 ditto ditto	ditto	0	1	4
9 ditto ditto	ditto	0	1	7
10 ditto ditto	ditto	0	1	11
12 ditto ditto	ditto	0	2	1
3 ditto medium	ditto	0	3	4
4 ditto ditto	ditto	0	1	2
5 ditto ditto	ditto	0	1	3
6 ditto ditto	ditto	0	1	6
7 ditto ditto	ditto	0	1	9
8 ditto ditto	ditto	0	2	3
9 ditto ditto	ditto	0	2	8
10 ditto ditto	ditto	0	3	3
12 ditto ditto	ditto	0	4	3
3 ditto very strong	ditto	0	5	2
4 ditto ditto	ditto	0	1	6
5 ditto ditto	ditto	0	2	0
6 ditto ditto	ditto	0	2	6
7 ditto ditto	ditto	0	3	3
8 ditto ditto	ditto	0	3	7
9 ditto ditto	ditto	0	4	3
10 ditto ditto	ditto	0	4	9
3 in. brass bed hook, cast				
1 ditto ditto	ditto	0	0	1½
11 ditto ditto	ditto	0	0	1½
12 ditto ditto	ditto	0	0	1½
1 ditto ditto	ditto	0	0	2½
2 ditto ditto	ditto	0	0	2½
3 ditto ditto	ditto	0	0	2½
4 ditto ditto	ditto	0	0	2½
5 ditto ditto	ditto	0	0	2½
6 ditto ditto	ditto	0	0	2½
7 ditto ditto	ditto	0	0	2½
8 ditto ditto	ditto	0	0	2½
9 ditto ditto	ditto	0	0	2½
10 ditto ditto	ditto	0	0	2½
11 ditto ditto	ditto	0	0	2½
12 ditto ditto	ditto	0	0	2½
1 in. screw hooks, brass, medium				
1 ditto ditto	ditto	0	0	0
2 ditto ditto	ditto	0	0	1
3 ditto ditto	ditto	0	0	1
4 ditto ditto	ditto	0	0	1
5 ditto ditto	ditto	0	0	1
6 ditto ditto	ditto	0	0	1
7 ditto ditto	ditto	0	0	1
8 ditto ditto	ditto	0	0	1
9 ditto ditto	ditto	0	0	1
10 ditto ditto	ditto	0	0	1
11 ditto ditto	ditto	0	0	1
12 ditto ditto	ditto	0	0	1
1 in. screw pulley, iron, no guard				
1 ditto ditto	ditto	0	0	1½
2 ditto ditto	ditto	0	0	2½
3 ditto ditto	ditto	0	0	3
4 ditto ditto	ditto	0	0	3½
5 ditto ditto	ditto	0	0	4
6 ditto ditto	ditto	0	0	4½
7 ditto ditto	ditto	0	0	5
8 ditto ditto	ditto	0	0	5½
9 ditto ditto	ditto	0	0	6
10 ditto ditto	ditto	0	0	6½
11 ditto ditto	ditto	0	0	7
12 ditto ditto	ditto	0	0	7½
1 in. ditto all brass	ditto	0	0	3½
2 ditto ditto	ditto	0	0	4
3 ditto ditto	ditto	0	0	4
4 ditto ditto	ditto	0	0	4
5 ditto ditto	ditto	0	0	4
6 ditto ditto	ditto	0	0	4
7 ditto ditto	ditto	0	0	4
8 ditto ditto	ditto	0	0	4
9 ditto ditto	ditto	0	0	4
10 ditto ditto	ditto	0	0	4
11 ditto ditto	ditto	0	0	4
12 ditto ditto	ditto	0	0	4

PULLEYS, fixed—

9 in. single-wheel hot-house pulley	ditto	0	0	10
2 1/2 ditto ditto	ditto	0	0	11 1/2
2 ditto ditto	ditto	0	0	12
2 double ditto ditto	ditto	0	0	11
2 ditto ditto	ditto	0	0	16
2 ditto ditto	ditto	0	0	18
2 treble ditto ditto	ditto	0	0	16
2 ditto ditto	ditto	0	0	21
2 ditto ditto	ditto	0	0	24
1 in. single side pulley, iron	ditto	0	2	3
1 ditto ditto	ditto	0	0	3 1/2
1 ditto ditto	ditto	0	0	3 3/4
1 ditto ditto	ditto	0	0	3 3/4
2 ditto ditto	ditto	0	0	4 1/2
2 ditto ditto	ditto	0	0	5 1/2
3 ditto ditto	ditto	0	0	7
double ditto	ditto	0	0	3 1/2
1 ditto ditto	ditto	0	0	4
1 ditto ditto	ditto	0	0	4 1/2
1 ditto ditto	ditto	0	0	5
1 ditto ditto	ditto	0	0	6
2 ditto ditto	ditto	0	0	7
1 in. single wheel all brass	ditto	0	0	5 1/2
1 ditto ditto	ditto	0	0	8
1 ditto ditto	ditto	0	0	10
1 ditto ditto	ditto	0	1	6 1/2
1 in. single, iron, with brass wheel	ditto	0	0	34
1 ditto ditto ditto	ditto	0	0	34
1 ditto ditto ditto	ditto	0	0	41
1 ditto ditto ditto	ditto	0	0	5
1 ditto ditto ditto	ditto	0	0	6
2 ditto ditto ditto	ditto	0	0	7 1/2
2 ditto ditto ditto	ditto	0	0	8 1/2
2 ditto ditto ditto	ditto	0	0	9 1/2
3 ditto ditto ditto	ditto	0	0	10 1/2
1 in. double ditto ditto	ditto	0	0	5
1 ditto ditto ditto	ditto	0	0	6
1 ditto ditto ditto	ditto	0	0	7
1 ditto ditto ditto	ditto	0	0	8 1/2
1 ditto ditto ditto	ditto	0	0	10 1/2
2 ditto ditto ditto	ditto	0	1	1
1 in. single upright pulley, iron	ditto	0	0	2 1/2
1 ditto ditto ditto	ditto	0	0	2 1/2
1 ditto ditto ditto	ditto	0	0	2 1/2
1 ditto ditto ditto	ditto	0	0	3
2 ditto ditto ditto	ditto	0	0	3 1/2
2 ditto ditto ditto	ditto	0	0	4
3 ditto ditto ditto	ditto	0	0	5 1/2
1 in. double ditto ditto	ditto	0	0	6 1/2
1 ditto ditto ditto	ditto	0	0	4
1 ditto ditto ditto	ditto	0	0	4 1/2
1 ditto ditto ditto	ditto	0	0	5 1/2
2 ditto ditto ditto	ditto	0	0	6
2 ditto ditto ditto	ditto	0	0	6 1/2
3 ditto ditto ditto	ditto	0	0	8
1 in. single ditto ditto all brass	ditto	0	0	11
1 ditto ditto ditto	ditto	0	0	8
1 ditto ditto ditto	ditto	0	0	10 1/2
1 ditto ditto ditto	ditto	0	1	3
1 in. ditto ditto brass wheel and iron frame	ditto	0	0	3
1 ditto ditto ditto	ditto	0	0	4
1 ditto ditto ditto	ditto	0	0	5
1 ditto ditto ditto	ditto	0	0	6
2 ditto ditto ditto	ditto	0	0	7
2 ditto ditto ditto	ditto	0	0	8
3 ditto ditto ditto	ditto	0	0	11
1 in. screw pulley, iron, no guard	ditto	0	0	11
1 ditto ditto ditto	ditto	0	0	2 1/2
1 ditto ditto ditto	ditto	0	0	2 1/2
1 ditto ditto ditto	ditto	0	0	3
1 ditto ditto ditto	ditto	0	0	3 1/2
2 ditto ditto ditto	ditto	0	0	4
2 ditto ditto ditto	ditto	0	0	4 1/2
2 ditto ditto ditto	ditto	0	0	5
3 ditto ditto ditto	ditto	0	0	6 1/2
1 in. ditto all brass ditto	ditto	0	0	3 1/2
1 ditto ditto ditto	ditto	0	0	4
1 ditto ditto ditto	ditto	0	0	6
1 ditto ditto ditto	ditto	0	0	7 1/2
1 ditto ditto ditto	ditto	0	0	11
2 ditto ditto ditto	ditto	0	1	2

		£	s.	d.
1	in. screw pulley, all brass, double wheel each	0	0	6
1	ditto ditto ditto	0	0	7
1	ditto ditto ditto	0	0	10
1	ditto ditto ditto	0	1	2
1	ditto ditto ditto	0	1	8
2	ditto ditto ditto	0	2	3
1	in. iron screw pulley with guard	0	0	2
1	ditto ditto ditto	0	0	3
1	ditto ditto ditto	0	0	3
1	ditto ditto ditto	0	0	4
2	ditto ditto ditto	0	0	4
2	ditto ditto ditto	0	0	5
2	ditto ditto ditto	0	0	7
1	in. ditto with brass wheel and ditto	0	0	3
1	ditto ditto ditto	0	0	4
1	ditto ditto ditto	0	0	4
2	ditto ditto ditto	0	0	6
2	ditto ditto ditto	0	0	7
2	ditto ditto ditto	0	0	8
2	ditto ditto ditto	0	0	10
1	in. all brass ditto ditto	0	0	6
1	ditto ditto ditto	0	0	8
1	ditto ditto ditto	0	0	10
1	in. lazy pulley	0	0	3
1	Brass ditto	0	1	1
1	Ditto ditto strong	0	1	6
1	Iron top cast pulleys, bronzed, unfixed .. per set	0	3	0
1	in. iron spectacle pulley, fixed	0	0	10
1	ditto ditto ditto	0	0	10
1	ditto ditto ditto	0	0	13
1	ditto ditto ditto	0	0	14
2	ditto ditto ditto	0	1	7
1	ditto and brass wheel ditto	0	1	0
1	ditto ditto ditto	0	1	2
1	ditto ditto ditto	0	1	5
1	ditto ditto ditto	0	1	8
2	ditto ditto ditto	0	2	0
1	in. cast-iron sash roller	0	0	4
1	ditto ditto ditto	0	0	4
1	ditto ditto ditto	0	0	5
1	ditto ditto ditto	0	0	5
1	ditto ditto ditto	0	0	5
1	ditto ditto ditto	0	0	6
1	ditto ditto ditto	0	0	6
1	ditto ditto ditto	0	0	8
1	in. all brass ditto ditto	0	0	10
1	ditto ditto ditto	0	0	4
1	ditto ditto ditto	0	0	6
1	ditto ditto ditto	0	0	7
1	ditto ditto ditto	0	0	8
1	ditto ditto ditto	0	0	8
1	cast-iron axle roller for sliding partitions	0	1	0
1	ditto ditto ditto	0	1	1
1	ditto ditto ditto	0	1	5
1	in. brass Venetian blind pulleys 1 wheel	0	0	5
1	Ditto ditto ditto 2 wheels	0	0	6
1	Ditto ditto ditto 3 wheels	0	0	7
1	ditto ditto ditto roller	0	0	8
1	ditto ditto ditto	0	0	9
1	in. iron axle pulley for sash frame stiles (light) unfixed	0	0	1
1	ditto ditto ditto	0	0	1
2	ditto ditto ditto	0	0	2
1	ditto ditto ditto	0	0	2
1	ditto ditto ditto	0	0	2
1	ditto ditto ditto	0	0	2
1	ditto ditto ditto	0	0	2
1	in. sheet brass face and wheels	0	0	4
1	ditto ditto ditto	0	0	4
1	in. brass face iron wheels	0	0	4
2	ditto ditto ditto	0	0	4
2	ditto ditto ditto	0	0	5
2	ditto ditto ditto	0	0	5
1	in. iron patent secret axle, unfixed	0	0	2
2	ditto ditto ditto	0	0	2
2	brass face and iron wheel	0	0	3
2	ditto ditto ditto	0	0	4
2	brass face and brass wheel	0	0	5
2	ditto ditto ditto	0	0	6
1	iron patent grip axle	0	0	1
1	ditto ditto ditto	0	0	2
1	ditto brass face	0	0	3
1	ditto ditto ditto	0	0	3
1	ditto and brass wheel	0	0	4
1	ditto ditto ditto	0	0	4
1	Kenrick's best make brass face and wheel	0	0	5
2	ditto ditto ditto	0	0	6
2	ditto ditto ditto	0	0	7
1	ditto extra strong	0	0	6
1	ditto ditto ditto	0	0	7
2	ditto ditto ditto	0	0	8
2	ditto ditto ditto	0	0	11
2	ditto ditto ditto	0	1	2
2	ditto with solid brass faces and polished gunmetal bushes	0	1	4
2	ditto ditto ditto	0	1	9
2	ditto ditto ditto	0	2	3

SHUTTER FURNITURE, fixed—

2	in. japanned flush lifts	0	0	4
3	ditto ditto	0	0	5
3	ditto ditto	0	0	6
3	ditto brass ditto	0	0	6
4	ditto ditto	0	0	6
4	ditto ditto	0	0	7
2	japanned shutter lifts	0	0	3
2	ditto ditto	0	0	3
3	ditto ditto	0	0	3
2	brass ditto	0	0	6
2	ditto ditto	0	0	7
3	ditto ditto	0	0	8
1	japanned thumb-screw	0	0	7
2	ditto ditto	0	0	7
2	ditto ditto	0	0	7
3	ditto ditto	0	0	8
3	ditto ditto	0	0	8
4	ditto ditto	0	0	9
4	ditto ditto	0	0	9
2	brass thumb-bit to ditto	0	0	9
2	ditto ditto ditto	0	0	10
2	ditto ditto ditto	0	0	10
3	ditto ditto ditto	0	0	11
3	ditto ditto ditto	0	0	11
4	ditto ditto ditto	0	1	1

3in. japanned shuttering.....	each	0	0	6
3 $\frac{1}{2}$ ditto ditto	ditto	0	0	6
4 ditto ditto	ditto	0	0	7
4 $\frac{1}{2}$ ditto ditto	ditto	0	0	8
5 ditto ditto	ditto	0	0	9
3in. brass ditto	ditto	0	0	7
3 $\frac{1}{2}$ ditto ditto	ditto	0	0	9
4 ditto ditto	ditto	0	0	1
14in. japanned shutter bar, with brass drop				
and cap	ditto	0	0	10
16 ditto ditto	ditto	0	0	11
18 ditto ditto	ditto	0	0	10
20 ditto ditto	ditto	0	0	1
22 ditto ditto	ditto	0	0	1
24 ditto ditto	ditto	0	0	1
14in. ditto, with brass spring box	ditto	0	0	11
16 ditto ditto	ditto	0	0	11
18 ditto ditto	ditto	0	0	10
20 ditto ditto	ditto	0	0	1
22 ditto ditto	ditto	0	0	1
24 ditto ditto	ditto	0	0	1
Japanned iron sash drop	per pair	0	0	3
Brass ditto	ditto	0	0	5
6in. japanned shutter bolt	ditto	0	0	8
7 ditto ditto	ditto	0	0	9
8 ditto ditto	ditto	0	0	9
9 ditto ditto	ditto	0	0	10
10 ditto ditto	ditto	0	0	10
11 ditto ditto	ditto	0	0	11
12 ditto ditto	ditto	0	0	1
2 by $\frac{1}{2}$ japanned shutter pivot, of 2 pieces ..	per set	0	0	6
2 $\frac{1}{2}$ by 1 ditto ditto	ditto	0	0	6
2 $\frac{1}{2}$ by 1 $\frac{1}{2}$ ditto ditto	ditto	0	0	7
2 by brass ditto	ditto	0	0	10
2 $\frac{1}{2}$ by ditto ditto	ditto	0	0	11
1 $\frac{1}{2}$ by japanned stubs and plates	ditto	0	0	6
1 $\frac{1}{2}$ by ditto ditto	ditto	0	0	6
2 by ditto ditto ditto	ditto	0	0	6
2 $\frac{1}{2}$ by ditto ditto ditto	ditto	0	0	7
1 $\frac{1}{2}$ by brass ditto ditto	ditto	0	0	8
2 by ditto ditto ditto	ditto	0	0	9
2 $\frac{1}{2}$ by ditto ditto ditto	ditto	0	0	8
1 in. wrought-iron shutter shoes	ditto	0	0	6
1 $\frac{1}{2}$ ditto ditto ditto	ditto	0	0	6
1 $\frac{1}{2}$ ditto ditto ditto	ditto	0	0	6
1 ditto ditto rebated	ditto	0	0	6
1 $\frac{1}{2}$ ditto ditto ditto	ditto	0	0	6
1 ditto ditto ditto	ditto	0	0	7
1 to 1 $\frac{1}{2}$ malleable cast-iron shutter shoes ..	per set	0	0	7
6in. japanned shutter fastener to drive ..				
with fly nut	each	0	0	6
7in. ditto ditto ditto	ditto	0	0	7
Shutter bell spring	ditto	0	0	4
3in. white china shutter knob to screw in ..	ditto	0	0	2
Ditto black ditto	ditto	0	0	2
1in. white or black ditto	ditto	0	0	2
1 $\frac{1}{2}$ ditto ditto	ditto	0	0	2
1 $\frac{1}{2}$ ditto ditto	ditto	0	0	2
2 ditto ditto	ditto	0	0	3
2 $\frac{1}{2}$ ditto ditto	ditto	0	0	3
1 in. ivory china brass rose ditto	ditto	0	0	4
1 $\frac{1}{2}$ ditto ditto ditto	ditto	0	0	5
1 $\frac{1}{2}$ ditto ditto ditto	ditto	0	0	6
1 in. crystal ditto ditto	ditto	0	0	2
2 ditto ditto ditto	ditto	0	0	2
1 $\frac{1}{2}$ ditto ditto ditto	ditto	0	0	3
2 ditto ditto ditto	ditto	0	0	3
1 in. amber ditto ditto	ditto	0	0	2
1 $\frac{1}{2}$ ditto ditto ditto	ditto	0	0	3
2 ditto ditto ditto	ditto	0	0	3
1 in. crystal, superior finish	ditto	0	0	1
1 $\frac{1}{2}$ ditto ditto	ditto	0	0	2
1 $\frac{1}{2}$ ditto ditto	ditto	0	0	2
1 in. amber ditto	ditto	0	0	2
1 $\frac{1}{2}$ ditto ditto	ditto	0	0	2
1 $\frac{1}{2}$ ditto ditto	ditto	0	0	2
2 in. brass shutter latch to take knob	ditto	0	1	7
2 $\frac{1}{2}$ ditto ditto ditto	ditto	0	1	8
2 $\frac{1}{2}$ ditto ditto ditto	ditto	0	1	9
2 $\frac{1}{2}$ ditto ditto ditto	ditto	0	1	11
3 ditto ditto ditto	ditto	0	2	3
Brass spring catch to press	ditto	0	0	11
Ditto large	ditto	0	1	1
Brass spring bolt to pull with thumb	ditto	0	1	1
Iron ditto ditto ditto	ditto	0	0	10

THE PRINCIPLES OF ORNAMENT.*

PROFESSOR AITCHISON'S edition of Mr. James Ward's treatise on "The Elementary Principles of Ornament" will to some extent supply the want there existed for a text-book on the subject suitable for students of art and of the Science and Art Department. It is concisely written, and convenient in size. Mr. Ward's book was recognised at South Kensington to some extent, but as it was in the lecture form it was too discursive. Mr. Geo. Aitchison, A.R.A., Professor of Architecture at the R.A., the Government examiner in the subject, induced the author to rewrite the work, and has edited it with an introductory chapter of his own. The principles of ornament or the theory upon which the artist proceeds to design are based on various considerations besides geometry. The investigation is one that proceeds from data to principles. There must be the objective and subjective forms of reasoning. Literal transcripts of Nature applied to surfaces or objects are not ornament, as many think it is, though it may be a kind of decoration, and yet not even that, unless it exhibits an endeavour to apply the natural forms.

* Principles of Ornament. By JAMES WARD, Head Master of the Maclesfield School of Art. Edited by GEORGE AITCHISON, A.R.A. London: Chapman and Hall, Ltd.

As the author observes, the units of the decoration must be arranged and brought into order. But ornament must be something more than this; it must carry the principle of arrangement and order into the unit itself—that element must be subjected to the crucible of the mind to discover how far it can be applied, first to the material, and next to the object or form to be ornamented. One of the first things—a very important one—is to discover to what extent is the natural plant or form admissible; in other words, how far should naturalism enter into ornament—how far may the accidental in Nature be carried. These are vital questions upon which all ornamentists are disposed to differ. Certain principles deduced from the growth of natural plants are given in the new Directory of the Science and Art Schools in the form of laws, very excellent and suggestive to students of ornament if they also bear in mind that ornament need not necessarily be imitated. The geometrical disposition of plants and flowers, their manner of growth, and the central type of their arrangements are the main things to study. Roman and Renaissance ornament exhibit these laws if we only endeavour to analyse it. The author deduces the following as the principal ones: "Geometrical arrangement, proportion, stability, repetition, contrast, symmetry, radiation, tangential junction, repose, variety, subordination, balance, unity, series, growth, superposition, fitness." In all good ornament these attributes, or some of them, appear—or, rather, no one of them ought to be contradicted. Some of them are more necessary than others; the necessity of geometrical arrangement is essential; repetition and contrast are also absolute laws of all good design.

Professor Aitchison's introductory chapter is worth reading; he lays stress upon the close study of plants, and the best examples of ornamental art, and says that artists cannot elaborate anything new or beautiful, so long as the public is content "with paraphrases of deceased art, or merely asks for a jumble of discordant scraps." He also values good traditional ornament like the Greek honeysuckle and the acanthus. The last has passed through the correcting and refining hands of Romans, Byzantines, and Renaissance artists, and the late Alfred Stevens has given it a new and, as he says, "peculiarly plastic character" in the Wellington monument. The student will find valuable suggestions on the methods of expression, the different kinds of ornament, such as outlined, flat, coloured, relieved, and shaded elementary forms, the classification of ornament in relation to the space to be filled, of which six kinds are described. The illustrations and diagrams are intended rather to be instructive than as highly finished or comprehensive, and are those the author gave as blackboard diagrams. The glossary will also be found of service to the student.

STEAM OR HOT WATER FOR GREENHOUSE HEATING.

IN order to determine whether steam or hot water were the best for heating greenhouses, a series of experiments have been made at the Agricultural Experiment Station in connection with the Cornell University (New York, U.S.A.), in which the following conclusions were arrived at:—1. The temperatures of steam pipes averaged higher than those of hot-water pipes throughout the entire circuit for the entire period of test. 2. The higher the inside temperature in steam pipes the less is the proportionate warming power of the pipes at a given point. The heat is distributed over a greater length of pipe, and as steam is ordinarily carried at a higher temperature than hot water, it has a distinct advantage for heating long runs. 3. When no pressure is indicated by the steam gauge, the difference between the temperatures of the riser and the return is greater with steam than with hot water. 4. Under pressure the difference is less with steam than with hot water. 5. There is less loss of heat in the steam risers than in the hot-water risers, and this means that more heat in the steam system is carried to the farther end of the house, and more is spent in the returns at bottom heat. 6. This relation is more uniform in the steam risers than in the hot-water risers, giving much more even results with steam than with hot water. 7. When the fires are operative the fluctuation in the temperature of the risers at any given point is much greater with hot water than with steam. 8. An increase in steam pres-

sure raises the temperature in the entire circuit, but the temperature does not rise uniformly with the pressure. 9. The first application of the pressure increases the temperature of the returns much more than that of the risers. 10. Steam is better than hot water for long and crooked circuits. 11. Pressure is of greater utility in increasing the rapidity of circulation of steam and in forcing it through long circuits and over obstacles. 12. Unfavourable conditions can be more readily overcome with steam than with hot water. 13. Hot water consumed more coal than steam, and was at the same time less efficient. This result would probably be modified in a shorter and straighter circuit with greater fall. 14. Under the conditions here present steam is more economical than hot water and more satisfactory in every way, and this result is not modified to any extent by the style of heaters used.

BOOKS RECEIVED.

The Gentleman's Magazine Library: a Classified Collection of the Chief Contents of the Gentleman's Magazine from 1731 to 1868. Edited by GEORGE LAWRENCE GOMME, F.S.A. (London: Elliot Stock).—Part II. of this compilation continues English topography from Cambridgeshire to Cumberland, and comprises notices and original communications of many important places in the counties of Cambridgeshire, Cheshire, Cornwall, and Cumberland. Family history is largely represented in the collection, besides local antiquities, history, local gifts, inscriptions, folklore, &c., which must make these volumes of much value to the county historian, the genealogist, and the antiquary. The architectural notes are of particular interest in describing edifices and ruins which have either been much altered or restored, or now no longer exist. As the editor truly says "The ancient local life of England is departing, and if we cannot altogether regret this, we can still look back upon glimpses of it with some degree of affection and a great deal of interest. It was solid, true, and picturesque." The church cross, the timbered house, the lords' hall are features which are repeatedly brought before us in these 18th century records. The ecclesiastical notes are of particular interest, also the inscriptions on tombs and slabs. Thus the description of Morwenstow Church in Cornwall is instructive as illustrating one of the stages in the history of the Church in Western England. The church occupies a stern headland in the parish of St. Morwenna, named after a daughter of a Celtic king in the 9th century, whose desire was to convert the pagan people. The legend of St. Morwenna is told in full. A font was set up with carved cable coiled round it in memory of the vessel of the fishermen of the East anchored in the Galilean Sea. The writer, the late Rev. R. S. Hawker, ascribes the first foundation of this saint to from A.D. 875 to A.D. 1000. A fine Norman doorway at the south entrance of present church, the font with its cable moulding, the old arches, the symbolic bosses of chancel roof are described. The chancel screen is said to act as the tympanum and to increase and reverberate the volume of sound. But the main interest in this notice of Morwenstow Church is the story attached to the Devil's Door in the north side. It is so named according to the tradition that "it was thrown open at every baptism at the Renunciation for the escape of the fiend, while at every other time it was carefully closed"—an old custom which explains the reason why the northern side of the churchyard is, according to ancient usage, devoid of graves, the north portion of the churchyard being the reputed region of Satan. Other examples of village churches in which traditional usages are found are interesting, and Mr. Gomme's collection of notes is a fund of information that will be appreciated by every student of old English history.—*Induction Coils: a Practical Manual for Amateur Coil-makers.* By G. E. BONNEY. Illustrated. (London: Whittaker and Co., Paternoster-square).—Mr. Bonney has done good service in bringing out a book to meet the wants of amateur electricians who desire a practical knowledge of the accessories and details of induction coils, information on which subject has generally been of a fragmentary nature. The amateur, by the aid of this manual, can make for himself not only ordinary "intensity or spark coils," but medical coils, and the batteries necessary for working them. The book is well printed and illustrated.

—*The Electric Light, Popularly Explained*, by A. BROMLEY HOLMES, M.Inst.C.E. (London: Bemrose and Sons, Limited), is a useful guide to the elementary principles of electric lighting intended for general readers. The technical terms are explained in a simple manner, and the typical examples of dynamos and lamps illustrated. Modes of distribution and the appliances used, and methods of measuring and testing the electric current, motive power, private installations, and cost are among the subjects treated. As a popular treatise on the subject, we can recommend it.—*A Pre-Norman Window at Oxford Cathedral.* By J. PARK HARRISON, M.A. (London: H. Frowde).—In January last (p. 190, last vol.) we noticed a pamphlet by Mr. Park Harrison giving a description of the discoveries of remains of three Early apses at the east end of Oxford Cathedral. The same author now publishes in like form a brochure on further discoveries in the building, including a circular-headed clerestory window in the south transept, and some Early work in the south aisle, which escaped destruction during Sir Gilbert Scott's restorations in 1879. The author suggests that the transept arch and apsidal recess belong to the church of the Holy Trinity, said to have been built by Didanos, the father of Frideswide, circa 735, and that some of the archaic features in the Norman work generally of the cathedral are copied from the remains of this Earlier church.—*The Decorator's Assistant, for Decorative Artists, Painters, Amateurs, &c.*, 5th edition, revised (London: Crosby Lockwood and Son), is a compilation comprising several hundreds of recipes, rules and instructions for mixing, preparing, and using stains, dyes, oil and water-colours, &c., which will be found serviceable for interior and exterior decoration. Painting, as applied to external architecture, is treated by Mr. H. Atkinson, architect; and Mr. Hessel Tiltman, A.R.I.B.A., writes on internal decoration. Many useful rules are given about painting, the combinations of colours, graining and marbling, painting ironwork, the treatment of damp walls, distempers, staining, &c. The recipes are numerous, and are taken from a variety of sources, and contain instructions to clean gold ornaments, picture-frames, hangings, brasswork, oil-paintings, engravings, &c.—*Arithmetic for Schools*, by BARNARD SMITH, M.A., new edition, enlarged by W. H. H. HUDSON, M.A., Professor of Mathematics, King's College, London (London: Macmillan and Co.), is a good handbook for schools and students. The reason of each rule is given, and precedes the rule. The examples are very numerous and complete, with answers, many being taken from examination papers. The work is well printed and arranged. Fractions and square and cubic measure, and decimal fractions are treated, upon rational methods with worked-out examples, rendering these troublesome operations of arithmetic intelligible to the student.—*Transactions of the American Society of Civil Engineers* (June) are to hand. This number contains the address at the Annual Convention, Fortress Monroe, Va., by the president, Mr. Mendes Cohen, and some notes on the Holland Dykes by Mr. William Starling, M.Am.Soc.C.E., and numerous illustrations.

OBITUARY.

WE regret to announce the death of Mr. Edward Ryde, Past President of the Surveyors' Institution, of 29, Great George-street, Westminster. Mr. Ryde, who died at his residence, Poundfield House, Woking village, on Thursday, the 1st inst., from liver disease, was within a few days of completing his 70th year. Mr. Ryde was born at Woking, and on the 20th June, 1837, he entered the office of Mr. James Martin Sanderson, of Sunbury. He served his articles there, and remained with Mr. Sanderson for eight years, being principally engaged during the time upon surveying, mapping, and valuing parishes, under the Tithe and Poor Law Assessment Acts. In 1845 he entered into partnership with Mr. Sanderson, but the partnership was dissolved the following year, and Mr. Ryde came to London. Having laid out and surveyed the direct Portsmouth line from Godalming to Havant, and the Alton and Winchester line, Mr. Ryde was in 1855 appointed surveyor to the South-Eastern Railway Company. About the year 1860 Mr. Ryde opened an office in Parliament-street, Westminster, and five years later he

resigned the detail work of the South-Eastern Railway Company, but remained their consulting surveyor, an appointment which he had ever since held. He suggested and laid out the London Bridge and Charing Cross and London Bridge and Cannon-street lines and stations and bought the land for those railways. He was engaged largely in the purchase of land for, and the sale of land to, railway and other public companies under the exercise of compulsory powers. He purchased the lands for the South-Western extension to Portsmouth, the Ascot and Aldershot, the Netley and Fareham, and the Leatherhead and Guildford lines, and also for the Clapham and Barnes widening of the Windsor line. Land for the Tunbridge Wells and Northampton sewage farms was also purchased by him. Mr. Ryde was concerned in the arbitrations between the telegraph companies and the Post Office on the purchase by the Government of the telegraph lines, and in the arbitrations between the Metropolitan Board of Works and the bridge companies on the freeing of bridges across the Thames. In rating valuations and objections, including most of the great appeals by railway companies, gas companies, water companies, tramway companies, and dock and harbour companies, Mr. Ryde was largely engaged. He was one of the first promoters of the Surveyors' Institution, and ever since its establishment had been a member of the council. He was president of the Institution of Surveyors in 1880-1, and was the first president of the Surveyors' Institution on the granting of the charter in 1881. Mr. Ryde was the author of a scale of surveyors' fees, which is known as "Ryde's Scale." Since March last he had been a member of the Surrey County Council. In 1848 Mr. Ryde married Miss Sarah Harrow, and her death in January last was a great blow to him. He leaves a family of five sons and one daughter. Three of the sons follow the deceased gentleman's profession, and were in partnership with him.

The interment took place on Friday, in the family vault at Holy Trinity Church, Southport, of Mr. John Greenwood, late of Hartwood-road, Southport. Deceased, who was 62 years of age, had long been resident in Southport, where he formerly carried on the business of stonemason and contractor, from which he retired with a competence. Among his more important contracts at Southport for stonework were the Victoria Baths, the Cambridge Hall, All Saints' Church, St. George's Presbyterian Church, and Trinity Wesleyan Hall. Deceased employed above a hundred men, and undertook several important contracts in well-known business premises at Liverpool. From 1884 to 1890 he sat in the Southport Town Council as a Conservative representative for West Ward.

The American papers announce the death of General William Petit Trowbridge, the head of the engineering department of the School of Mines, Columbia College. He was born in Oakland County, Michigan, in 1828. Through the war of the Rebellion General Trowbridge served in the Union Army. In 1870 he was elected Professor of Dynamical Engineering in the Sheffield Scientific School of Yale College, where he continued until 1877, when he was appointed head of the engineering department of the School of Mines of Columbia College. He was a member of several scientific societies, was a voluminous writer, and is said to have been the first engineer to suggest the idea of the cantilever bridge.

A new organ, which has been erected by Messrs. Nicholson and Lord, of Walsall, in St. Mary's Church, Bearwood-road, Smethwick, at a cost of £350, was opened on Friday.

At the last meeting of the police committee for Anglesea Sir Richard Bulkeley offered to give a site at Llangefni for the proposed county buildings. The gift was accepted with thanks, and it was decided to offer a premium of £60 for the best plan for the buildings, the cost to be limited to £6,000. At the same meeting a tender for £2,700 from Mr. William Williams, of Holyhead, was accepted for the erection of a county police-station in that town, under the superintendence of Mr. Richard Davies, architect, of Bangor.

During the restoration of the Abbey Wall, in Marygate, York, recently, the foundation of the bastion, which formed part of the original wall, but had been demolished, was disclosed. This bastion was about 6ft. in diameter, and if restored Mr. Creer, the city surveyor, thinks it would form no obstruction to traffic in the street. Mr. Creer has accordingly received instructions to carry out the restoration.

CONTENTS.

An Architect's Reference Library	341
The Ownership and Return of Drawings	342
Incombustible Construction	343
Stability of Walls on Soils.—V	344
Gosford House, N.B.	345
A Sanitary Crusade through the East and Australasia.—II	346
Domestic Sanitary Appliances	347
Prices.—XIV	348
The Principles of Ornament	349
Steam or Hot Water for Greenhouse Heating	349
Books Received	350
Obituary	351
Our Illustrations	351
Competitions	351
Architectural and Archaeological Societies	351
The Building News Directory	351
Wayside Notes	351
Sanitary Congress at Portsmouth	351
The Largest Cold Meat Store in the World	351
Shadows in Perspective.—V	351
Building Intelligence	351
Engineering Notes	351
Correspondence	351
Intercommunication	351
Legal	351
Legal Intelligence	351
Water Supply and Sanitary Matters	351
Our Office Table	351
Trade News	351
Tenders	351

ILLUSTRATIONS.

GOSFORD HOUSE, N.B.—CALLE MAYOR, FUENTERRABIA.—
LEWISHAM CENTRAL PUBLIC LIBRARY.—NEW CHURCH,
WEST DULWICH.—DESIGN FOR A BRICK SUMMER-HOUSE.
—GRAND HOTEL, CLACTON-ON-SEA.—NEW FURNITURE
FOR THE COUNCIL CHAMBER, YORK.

Our Illustrations.

GOSFORD HOUSE, N.B.

(See description and sketch-plan on page 345.)

CALLE MAYOR, FUENTERRABIA.

FUENTERRABIA (the French Fontarabie) in the province of Guipuzcoa, on the right bank of the Bidasoa, and opposite the French town of Hendaye, occupies a very picturesque position at the foot of the Jaiz-queibet mountains. It is a thoroughly old Spanish town, originally a strong frontier fortress. The walls are now dismantled. In its dilapidation it yet preserves a somewhat haughty appearance, and has been compared to a "ruined hidalgo wrapping himself up in his tattered cloak." The Calle Mayor is a perfect specimen of picturesque originality. Most of the houses were formerly palaces of the old nobility, and though they are now turned into shops, some of the façades are still emblazoned with the bearings of their ancient proprietors, sculptured in high relief. On entering the street by the Puerta Principal, the effect is that of a deep twilight after the broad blaze of the sunny mountains. This is caused by the almost flat roofs, which project considerably beyond the fronts of the houses, and are nearly all supported by carved woodwork, black with age. The massive parish church, dominated by its campanile and lantern, forms perhaps the most important feature of the town. Our illustration is taken from a specially-prepared impression of an exquisite etching by Mr. T. J. Dalgliesh, to whom we are indebted for permission to issue the reproduction printed herewith.

LEWISHAM CENTRAL PUBLIC LIBRARY.

This building is to be erected in the High-street, Lewisham. The whole of the ground floor is to be devoted to the public, saving expense in attendance and supervision. The building will have a frontage of 69ft., and the following accommodation:—Central entrance—to the left, librarian's room, and to the right, staircase to librarian's apartments; large central hall and borrowers' counter, with lending library for 10,000 books; out of this hall, reference library, news and magazine rooms; in basement, store for 10,000 books, with lift to lending library, and spiral staircase; the whole of upper floors are devoted to the librarian, with exception of one large room for board meetings of commissioners. It will be built in red brickwork and Corsham stone dressings, from the designs of Mr. Albert L. Guy, architect, 78, High-street, Lewisham.

CHURCH AT WEST DULWICH.

The design published in this issue is for the extension of a church erected many years ago in

this suburb. The addition consists of two bays of the nave and aisles, an apsidal baptistery forming the western entrance to the nave, from which it is separated by a triple arcaded screen under an inclosing pointed arch. On either side of the baptistery is a porch with outer and inner doors; nearly 300 additional sittings are obtained. The material to be used is Kentish rag externally, with box ground dressings; internally, white brick lining to match the rest of church. The piers are of Box Ground stone, the shafts of blue Pennant, and other internal work of Corsham Down stone. The roof will be tiled; the seats will be of varnished pine. The large west window has a double order, the inner one consisting of detached Pennant shafts carrying pointed arches. The architect is Mr. Edwin T. Hall, F.R.I.B.A., of 57, Moorgate-street, E.C.

"BUILDING NEWS" DESIGNING CLUB: A BRICK SUMMER-HOUSE.

The selected design for this subject was published in the BUILDING NEWS for June 24th last, and a review of the whole of the series sent in competition was issued in our number for June 10th. To-day we print the plan contributed by "Smilash the Goth," and awarded the second place. There remains nothing to add to our former remarks, in which exception was taken to the outline of the roofing; we thought the windows unnecessary, preferring Dutch shutters, and said that the Chinese-like ridge-pole with the dragons on the ends was considered unnecessary. The cornice and treatment over the entry are very prettily managed. The steps should have been solid. The author has realised better than the first-placed designer our intention as to the plaster frieze and ceiling. His cut-brick columns are, however, expensive features, which would not wear well—a consideration of no small importance in the construction of garden-houses, which are often neglected.

GRAND HOTEL, CLACTON-ON-SEA.

MESSRS. ROGER SMITH, SON, AND GALE are the architects of this new hotel at Clacton-on-Sea. We have no further description to hand of the structure.

FITTINGS IN NEW COUNCIL CHAMBER, YORK.

These illustrations, and two more pages we shall give next week, show some of the interior fittings of the above. The work was designed by Mr. Gilbert S. Doughty, architect, of Nottingham, and submitted in competition with twelve other sets of designs last year. The whole is carried out in white oak and wax-polished, with gun-metal fittings. The work has been executed by Messrs. Oldham and Knight, contractors, of Nottingham, in a most satisfactory manner.

The new railway to Baltimore, co. Waterford, will shortly be opened by the Baroness Burdett-Coutts. Mr. Reid is the engineer in charge, and Messrs. Murphy and Co. are the contractors.

In the case of Reuben Cull, of Enfield, Middlesex, and Palmerston-buildings, Old Broad-street, City, brick and tile merchant, trading with R. T. Cull as R. Cull and Son, the discharge from bankruptcy has been suspended for two years, ending July 27, 1894.

A handsome clock and turret have been presented to the town hall, Cardigan, by the mayor, Mr. David Davies. The clock has four large illuminated dials. It strikes the hours and chimes the quarters. It has been made by John Smith and Sons, Midland Clock Works, Derby.

On Monday last a Baptist chapel was opened at Yalding, in Kent; and a short time before memorial stones were laid for new Baptist Sunday schools at Tunbridge Wells. Memorial stones have recently been laid of a Wesleyan chapel, Port Talbot, South Wales; Wesleyan chapel at Eskring, Notts; and of a Wesleyan church parlour and sexton's lodge at Llandudno. The Baptist chapel, Green-lane, Derby, has just been reopened after alterations; and a Wesleyan chapel has just been opened at Whitwell, Notts. The contract is just let for a Wesleyan chapel at Settle, Yorks; for extensive improvements at the Congregational church, London-road, Derby; and for extension of the Wesleyan mission chapel, Mansfield, Notts; also for new Wesleyan schools at Hucknall Huthwaite, Notts; and Annesley Woodhouse, Notts. The Baptist chapel, Abingdon, is to have extensive renovations, the Baptist mission-hall, Bell Green, Catford, S.E., is to be enlarged, and a new Wesleyan chapel is to be built at Eastleigh, Hants. The architect for the whole of the above is Mr. John Wills, F.S.Sc., Derby.

COMPETITIONS.

MERTHYR TYDFIL INTERMEDIATE SCHOOL.—The design submitted by Mr. James Crombie, A.R.I.B.A., London, has been placed first, and he is appointed to carry out the work. The school will accommodate 100 boys and 80 girls, and will have, besides the usual school and classrooms, a gymnasium, workshop, laboratory, art and cooking class-rooms, and a residence for the caretaker.

MANCHESTER TECHNICAL SCHOOL.—The award in this important competition has just been made known, and is as follows:—1st premium of £200, Messrs. Spalding and Cross, 15, Queen-street, E.C.; 2nd, £150, Messrs. Gibson and Russell, 11, Little Queen-street, Westminster; 3rd, £100, Mr. Ernest A. Runtz, 22, Moorgate-street, and Mr. Frederic R. Farrow, 2, New-court, Carey-street, W.C. (jointly); 4th, £75, Mr. Theodore Lington, 53, Oxford-street, Manchester. Mr. Alfred Waterhouse, R.A., was the assessor, and 26 sets of designs were sent in. The technical school is to be built in Whitworth-street, Manchester, and will contain about 144,400 square feet; it will include some thirteen departments, and the cost was limited to £75,000. The instructions stated that Gothic designs were not considered suitable, that the elevations might be of Ruabon brick, and that fireproof construction should be adopted. The competition designs are now on view at the Municipal School of Art, Cavendish-street, Manchester.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

GLASGOW ARCHITECTURAL ASSOCIATION.—The usual monthly meeting was held in the rooms, 114, West Campbell-street, on Tuesday evening, the president in the chair. After the ordinary business was transacted, Mr. Chas. R. McIntosh read a paper descriptive of his tour in Italy, while he was the recipient of the Alexr. Thomson Travelling Studentship. His route took in, amongst others, Naples, Palermo, Rome, Orvieto, Siena, Florence, Pisa, Lucca, Bologna, Ravenna, Venice, Padua, Vicenza, Verona, Milan, and Pavia, the principal buildings in each of which he noted and criticised in a very racy manner. The paper was illustrated by a large collection of admirable pencil and water-colour sketches and some good photographs. A short discussion followed, and a vote of thanks was passed to the essayist.

CHIPS.

Mr. James Brooks, V.P.R.I.B.A., has sustained a great bereavement in the death of his wife, which occurred on the 31st ult. after great suffering from cancer.

A stained-glass window, representing the "Raising of Jairus's Daughter," has been placed in the United Presbyterian Church at Troon, N.B. Mr. William Smith, of London, was the artist.

The rural sanitary authority of Chipping Sodbury, Gloucestershire, has under its consideration reports on the sanitary condition of Yate Workhouse and the outfall drainage at Wickwar, prepared by Mr. J. Fletcher Trew, C.E., of Gloucester.

The county town and borough of Monmouth is about to be entirely resurveyed from plans prepared by Mr. J. Fletcher Trew, C.E., of Gloucester.

The Dean and Chapter have received promises of nearly £5,000 towards the sum of £20,000 appealed for to repair Lichfield Cathedral.

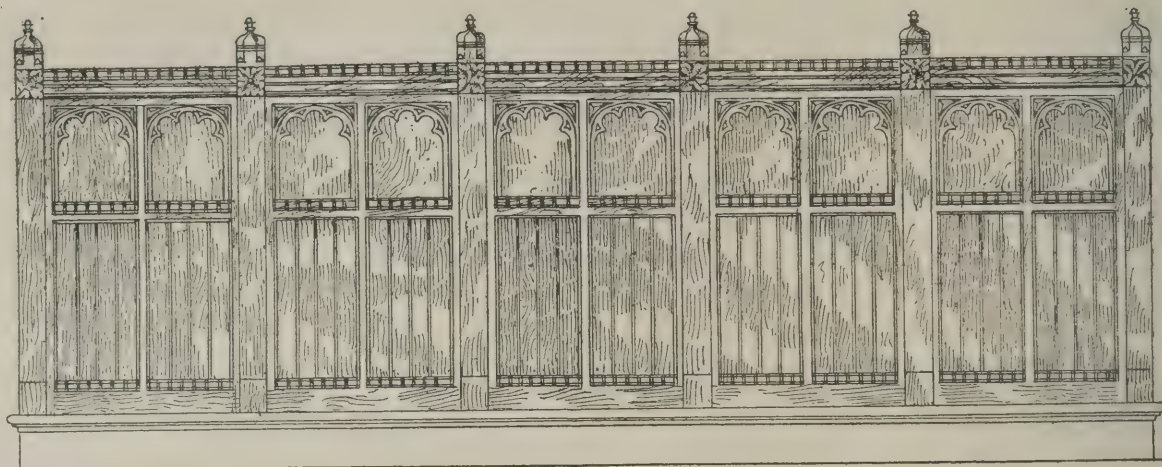
A monument to the distinguished German architect, Gottfried Semper, was unveiled on the Brühl Terrace at Dresden on Friday, in the presence of the members of the Association of German Architects and Engineers, and of the principal authorities of the city. Professor Lepsius delivered a speech recalling the great services rendered by Semper to architecture, while Herr Wiebe, Chief Government Surveyor of Berlin, handed over the monument, which is the work of the sculptor Schilling, to the City of Dresden. Semper was the designer of the new museum and other public edifices at Dresden.

The oldest house in Winchester, the Old Rectory in Cheesehill-street, has just been restored to its original appearance in the reign of Henry VI., and is full of old furniture and occupied by art workmen in wood. Messrs. Kitchen and Thomas are the tenants, and carried out the restoration.

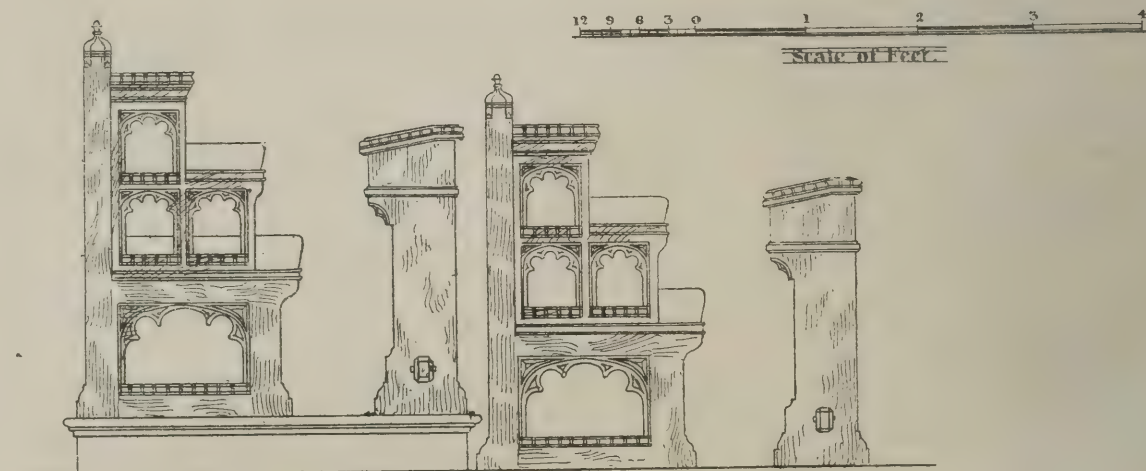
The city council of York are about to seek powers for further extending the boundaries of the city borough in the direction of the townships of Clifton and Huntington, by the inclusion of a suburban area of 263 acres.

City of York:

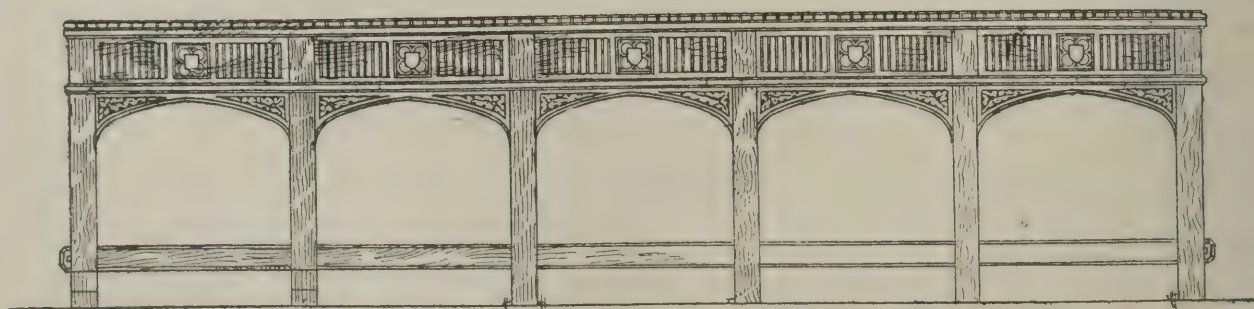
Fittings for the New Council Chamber:



View of the Back of Aldermen and Councillors' Seats.



End View of the Seats and Desks for Aldermen and Councillors.

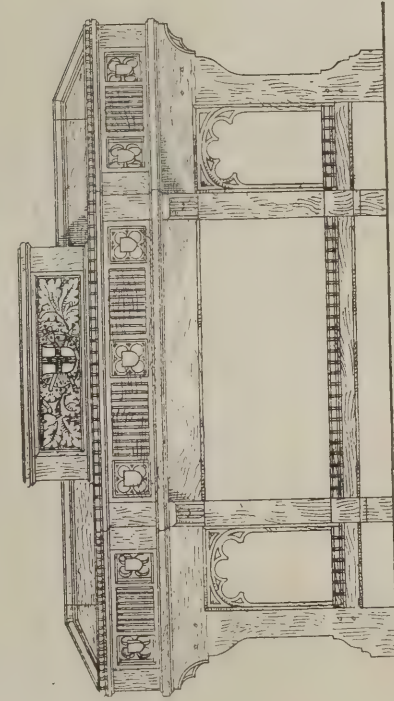


Front View of Desks for Aldermen and Councillors.

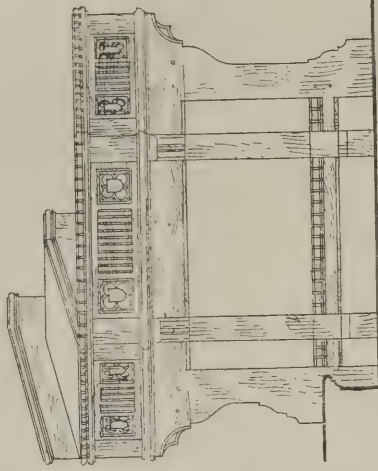
Gilbert S. Doughty, Architect.
14 Fletcher Gate, Nottingham

City of York :

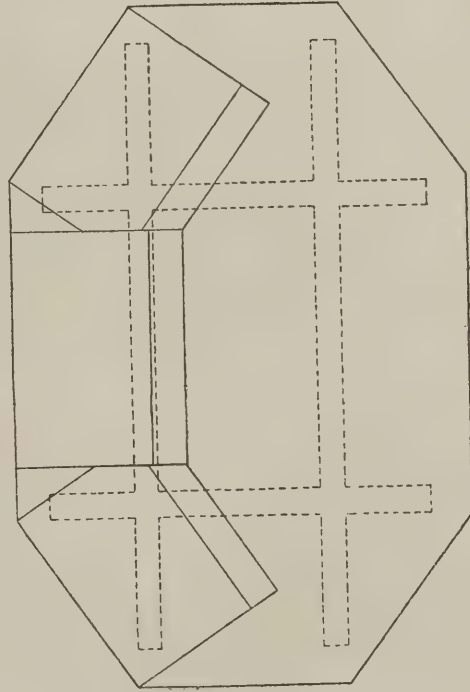
Fittings for the New Council Chamber:



Front View of Town Clerks Table.

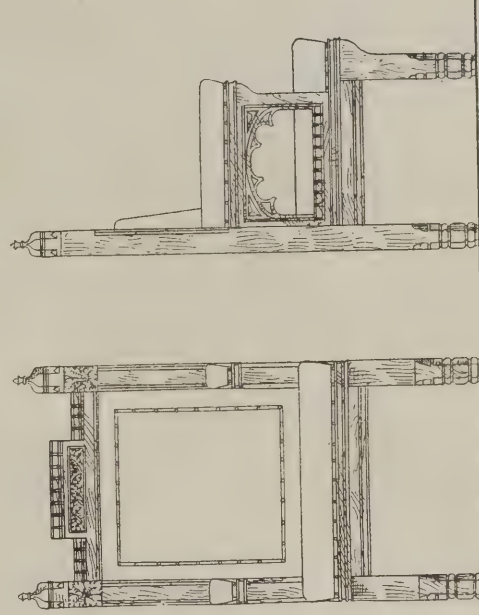
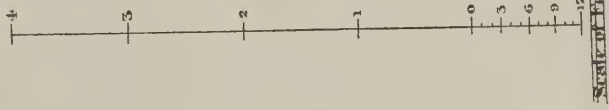


End View of Town Clerks Table.



Gilbert S. Daugherty, Architect.

14, Kitchener Gate, Nottingham. Plan of Town Clerks Table.



Chairs (if preferred) for Aldermen and Councillors.

WAYSIDE NOTES.

A SATISFACTORY condition of things is reported in connection with the doings of the Commission for the Preservation of Monuments of Arab Art, which, as all interested in Egyptian archaeological matters well know, has its headquarters at Cairo, and seeks to afford a stitch-in-time to the many fine old buildings of that city. Not the least gratifying fact with respect to the Commission is its financial arrangement. Of an annual Government grant of £4,000 E., only £600 E. is devoted to office expenses, which also include the salary of M. Hertz, the able architect to the Commission. The remaining sum is therefore available for restoration purposes, and is devoted to good ends by the members of the Commission, who are said to meet with regularity, and throw much energy into their work.

Since there are some 800 monuments in Cairo registered as worthy of preservation, it may be imagined that the funds of the Commission are quickly exhausted. In the majority of cases the sums paid are small, and devoted simply to patching-up and preserving from actual ruin the various buildings, &c., where decay threatens destruction; but the Commission has expended large sums in several cases. In the repair of the Mosque of Jemâl-ed-dîn, the Ustâd-dâr in Jemâlêya, for example, the sum of £800 was spent; £680 was laid out on the mosque of "Kâdy Jahyâ Zeyn-ed-dîn," and £1,000 for the repair of the old and magnificent mosque of Ifn-Tûlûn. Much more could of course be accomplished if further funds were forthcoming, as the Commission extends its operations beyond the limits of Cairo. All who admire the phase of Arab art that the Commission seeks to preserve, will sympathise with the work of the members of the Commission, and as we hope to some day have an opportunity to visit the architectural wonders of Egypt, the preservation of beautiful buildings from certain ruin should be a matter of direct interest.

I read that the restoration of the "Old Red Hall" at Bourne, Lincolnshire—"Guy Fawkes Mansion"—has now been completed. This is one for the S.P.A.B., who successfully petitioned the Directors of the Great Northern Railway Company with a view of saving and restoring the building when it was threatened with demolition on account of railway extensions.

The necessity for further asylum accommodation everywhere is something fearful to contemplate. Lincolnshire seems to be in as bad a way as any county, and possibly worse, it being stated that lunacy has been on the increase in the county. It is now proposed to erect another asylum. There is, however, it appears, a workhouse at Spalding capable of accommodating 400 persons, and now only occupied by 80 inmates, and an alternative to building another asylum has been suggested—viz., the employment of this building for the reception of lunatics. If it be found that the Spalding Workhouse is always as empty as at the present time, and the building were suitable, it would seem a sensible thing to turn it into an asylum and build a smaller workhouse. The probability is that the building is altogether unsuitable without conversion, in which case all will agree that a new asylum will be more to the purpose and more beneficial to the unfortunate people who would occupy it.

Do painters ever have the subjects and composition of their pictures revealed to them in their dreams? asks the contributor on art matters to the *St. James's Gazette*; and I am caused to wonder in a similar manner whether there ever appeareth in dreams to the architect divers and curious architectural conceptions. That new order or style of architecture for which we have been so long looking may perhaps be some day revealed in this way. Someone there certainly was in history or fiction who used to keep drawing materials, &c., ready to hand in case of any magnificent architectural idea occurring to him in his slumbers. Was it not our old guide, companion, philosopher, and friend—Pecksniff, to wit? The faculty of dreaming architectural compositions would be an invaluable one to competing architects, who, having racked their brains in futile endeavours to find a new outline for the one hundred and seventy-seventh gable in their

design would see the same appear before them with all the glamour and soothing ease of the phenomenon called dreaming. Now I do call to mind that years back I dreamed a dream to the effect that I was to build a tower like one I was shown; but the tower in question was a poor sort of affair, a mere commonplace Renaissance, unworthy of an architect's office-boy—a sort of confectioner's jelly-mould, and positively less architectural than a wedding-cake. It is not a little remarkable that during my architectural career I can call back from dreamland but two instances of any note professionally speaking, and further, it is always something to do with a tower. Not many nights ago a certain Form appeared before me which, according to custom in dreamland, may have been indifferently a tom cat, frying-pan, or sack of coals, but which I have every reason to seriously believe was meant for a sort of sugar-loaf mountain seen at a distance. Anyhow, I was impressed with the solemn effectiveness of the outline, and have had some doubts as to whether, with its battered sides, it did not once and for all show the fallacy of sheer walls when sublimity is desired, notwithstanding all the Alpine precipices and "beetling crags" in existence and the arguments of all the writers on architectural ethics.

Shipbuilding is very slack just at present, if the condition of a "yard" at Middlesbrough is a true indication of the industry in general. It is reported that owing to the difficulty experienced in obtaining new work, Sir Raylton Dixon and Co. have decided to close their No. 2 yard at Middlesbrough as soon as the vessels in course of construction are completed. For some time, it is said, batches of men have been paid off week by week, and it is expected that in a month or six weeks all the hands will be discharged—until quite recently 600 in number.

It is pitiable to think of a body of men having first called to their aid a professional referee, sitting down and deliberating as to whether they are bound to observe his decision. Such appears to have been the case in the competition for the Llanelly Town Hall, where the Local Board, having received Mr. Barry's report, immediately ask whether there is anything binding them to respect the same. It is no great mystery to me how this happens, sad as it is from the point of view of architectural competitors. Doubtless the ideas of a town council do not ordinarily run on pure architectural devices, but would be in the way of something a little lighter and more "ornamental." One can therefore easily understand that there might be a design or two very captivating to even the Cambrian imagination, and there would be a temptation to over-ride the assessors' award, and to adopt the more taking design. This is one of the inevitable evils accompanying the appointment of assessors. If anyone can show how it is to be remedied, a great benefit will be conferred on the profession.

GOTH.

CHIPS.

New and enlarged Wesleyan school buildings at Winchester were opened on Tuesday week. The cost of the alterations has been £1,005, and accommodation is now provided for 400 children. Messrs. Colson and Son, of Winchester, are the architects and Mr. Hutchings is the contractor.

On Saturday the Primitive Methodists at Trimdon Grange, co. Durham, opened a new church. The building is of red brick with stone facings, and of Gothic style. The plans are from the designs of Mr. J. F. Longstaff, Trimdon Grange, under whose superintendence the building has been erected. The builder is Mr. Burn, of Hartlepool. The cost is about £600.

Works of water supply have just been completed at Netherlee-bridge for the Widnes local board. Messrs. C. O. Ellison and Son, of Liverpool, are the architects and Messrs. Henshaw and Sons the contractors.

The Glasgow and South-Western Railway Company are making arrangements for an extension of their carriage and waggon repairing shops at Kilmarnock, at an estimated cost of £4,000, to meet the requirements of their largely increased rolling stock.

A new turret clock, placed in the tower of St. Peter's Church, Peterchurch, was started last week. It has been constructed by Messrs. John Smith and Sons, of Derby, at a cost of £150, and has two six-foot dials.

SANITARY CONGRESS AT PORTSMOUTH.

THE thirteenth annual Congress of the Sanitary Institute will be held at Portsmouth from the 12th to the 17th inst. The proceedings will be opened on Monday next, the 12th inst., by a reception by the Mayor, to be followed by the inaugural address by the President of the Congress, Sir Charles Cameron. On Tuesday, the 13th, five conferences will be held at the Town-hall: one of municipal and county engineers, under the presidency of Mr. H. Percy Boulnois, of Liverpool (and formerly of Portsmouth); another of naval and military hygienists, a third of medical officers of health, another of sanitary inspectors, and a fifth of ladies on domestic hygiene. On Wednesday, the 14th inst., Section I., "Sanitary Science and Preventive Medicine," will be opened by an address by Professor J. Lane Notter, M.D., to be followed by papers and discussions. Section II., "Engineering and Architecture," will commence its sittings on Thursday, the 15th, when Mr. James Lemon, the Mayor of Southampton, will deliver an inaugural address, and papers and discussions will be read on that and the following day. On the Friday Section III., "Chemistry, Meteorology, and Geology," will hold its meetings; and in the evening Dr. W. H. Corfield will give an address to the working classes in the Town-hall. Saturday will as usual be devoted to excursions in the neighbourhood.

THE LARGEST COLD MEAT STORE IN THE WORLD.

THE Civil and Mechanical Engineers' Society visited on Tuesday the new Cold Meat Store of Messrs. Nelson Brothers (Limited), Lambeth. This store is said to be the largest in the world, being capable of holding 270,000 sheep. It was designed by Sir Frederick Bramwell, Bart., and Mr. H. Graham Harris. The store may roughly be described as a brick box 150ft. long by 150ft. wide, and 40ft. deep, buried in the ground to the extent of 20ft. The only openings into it are at the top. Inside this brick box is a wooden one disconnected from the brick wall, and having six wooden floors in it, these being so constructed that cold air can circulate through them.

In order that the unloading of the barges which receive the meat from the ships in the docks below bridge may be expedited as much as possible, a 100ft. jetty has been constructed, which, with a private dock inside the wharf, will enable eleven barges to be unloaded at one time. Ample provision has been made for the distribution of the meat for the purpose of consumption; as many as twenty vans can be loaded at one time.

The cooling is effected by two De la Vergne engines and apparatus, and by two of Messrs. Haslam's cold-air machines. The store is lighted by electricity, and has all modern lifting and other necessary appliances. During the last twelve months two and a half million sheep have been imported by Messrs. Nelson Brothers.

A new pig market is being provided by the Corporation of Birmingham in Montagu-street, to take the place of that in the Smithfield. The market covers in an area of 3,200 square yards. The roof is partly glazed and partly slate, and is carried on iron girders and columns, the walls being of brick, the floors of blue brick set in cement, and the pens of iron. The cost will be about £19,000, and Mr. C. A. Horton, of Brierley-hill, is the contractor.

At a meeting of the building committee and trustees of the United Methodist Free Churches, held at the U.M.F.C. rooms, Markhouse-road, Walthamstow, on Saturday evening last, it was unanimously decided to accept the plans and designs prepared by Mr. J. Williams Danford, M.S.A., architect and surveyor, of 100c, Queen Victoria-street, E.C., for the new church buildings proposed to be erected in Walthamstow. The total cost of the scheme will be about £4,000. Mr. Danford has been instructed to proceed with the work at once.

Part of the Long Mead Estate (about ten acres), at Bishopstoke, has been secured by the County of Hants Land and Building Society. The site is separated from the village and the Fair Oak-road by a stream, and access to the site is to be obtained by a bridge. Mr. Crook, of Swathling, has the building of the bridge for the company, and commenced operations last week. The proposed bridge will be 40ft. wide, and is situate below St. Agnes, on the Fair Oak-road. For the construction of roads and fences, the tender of Mr. J. Butt, of Southampton, has been accepted at £1,006.

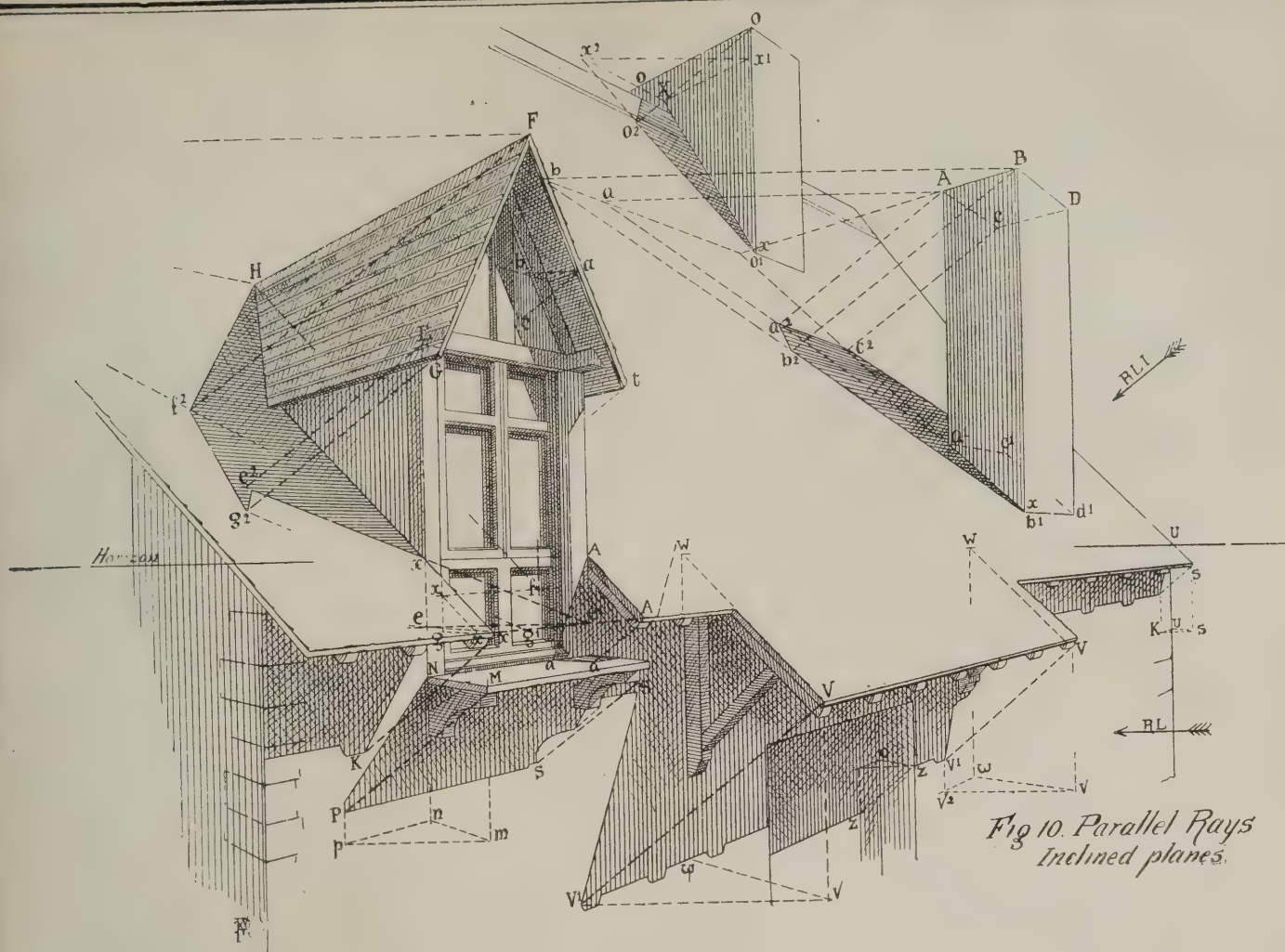


Fig 10. Parallel Rays
Inclined planes.

SHADOWS IN PERSPECTIVE.—V.

By ARTHUR VYE PARMINTER.

OUR next study will be that of shadows thrown or received by inclined planes, such as that of a chimney or dormer against the sloping side of a roof. The system is the same in principle as for the foregoing examples, but is naturally a little more intricate, especially for those who have little or no knowledge of descriptive geometry. But attention to the rules and care in drawing the constructional lines will soon overcome any little difficulty that may at first occur.

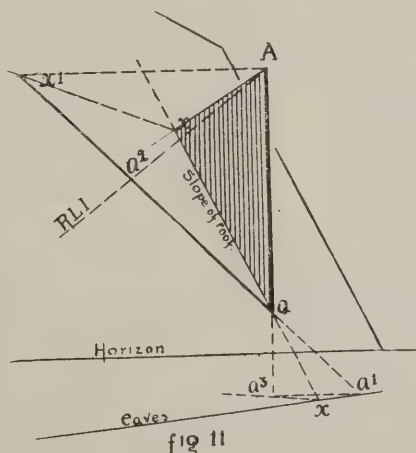
The rays of light are still supposed to come parallel to the picture plane, and at any given angle to the horizontal plane, as RLI and RL .

We will first take the Fig. 11, and construct the shadow supposed to be thrown by the vertical line Aa against the plane of the roof. We will consider two methods for finding the shadow; each one may be employed when the other is found inconvenient.

We know that, to have the line of shadow of Aa , we must find the line where the plane, passing by Aa and containing the rays of light, intersects the plane of the sloping roof. This line of intersection will be the shadow-line of Aa . A student of descriptive geometry will have no difficulty in finding the line of intersection; but we will proceed in a manner perfectly clear to those who have no knowledge of this science.

Through point A we draw a line Ax to the vanishing point to the left, and from the lower point a , where the vertical Aa meets the roof, we draw a line ax parallel to the slope of the roof plane, and meeting Ax at x . (This line ax is, in reality, not perfectly parallel to the slant of the roof, for all these lines should converge to the aerial vanishing point of the roof; but in ordinary perspective the difference is so slight, that we will not take it into account.) We have now a plane Axa perpendicular to the roof plane, and intersecting it by the line ax . This plane Axa is evidently perpendicular to the roof plane, for the line Aa is vertical, the angle xAa is a right angle in perspective, and the line Ax goes to the vanishing point other than that

of the lines of the roof. We have, therefore, found the line of intersection ax of the roof plane with another plane Axa perpendicular to it. Now the plane and the intersection with the roof that we wish to find is a plane parallel to the picture plane, and containing the rays of light. We must, therefore, turn the plane Axa on the vertical axis Aa until it becomes parallel to the picture plane. To do this we draw from A a horizontal line $Ax1$, and from x a line from



the vanishing point to the right, meeting the horizontal $Ax1$ at $x1$. We join $x1a$. The plane Axa is now brought parallel to the picture plane in the plane $Ax1a$, the point x becomes $x1$, and the line Ax is now the horizontal $Ax1$. The line of intersection with the roof ax is now $ax1$, and is the intersection of the plane $Ax1a$ with the roof. A line from A in the direction RLI will give us the shadow point of A at $a2$; therefore, $aa2$ is the shadow line of Aa .

The second method may seem simpler. From a we draw ax , representing the slant of the roof,

and meeting any of the horizontal lines (in perspective) of the roof; say, the eaves at x . From x we draw a line $xa3$ to the vanishing point, and find the projection of a thereon at $a3$. The point $a3$ is now on a line perpendicular to the line of the eaves, and is contained in the plane $aa3x$, in the same plane as Axa . We bring this plane $aa3x$ parallel to the picture planes by means of the horizontal line $aa3a1$ meeting the line of the eaves at $a1$. The plane $aa3a1$ is parallel to the plane of the picture, and is in the same plane as $Ax1a$. A line from $a1$, through a , to $a2$ gives us $aa2$, the shadow line of Aa . Thus by means of either method we arrive at the same result.

Let us now turn to Fig. 10, and construct the shadows thrown by the chimneys and dormer window. For the chimney ABD , we will employ the first system; the student may test its correctness by means of the second method. We have to find the shadow lines of the vertical angles of the chimney $Aa1$, $Bb1$, $Ob1$. We prolong the line $a1$, $b1$, representing the slope of the roof, and from B we draw a line to the vanishing point, and meeting $b1a1$ prolonged at 01 . From 01 we draw a line from the other vanishing point, and meeting the horizontal line drawn from B at b , join $b01$, and from B draw the line in the direction of the rays of light RLI , meeting $b01$, at $b2$; $b1b2$ is the shadow of $Bb1$. Likewise from point A we draw the horizontal line Aa , meeting the line from the vanishing point at a . The intersection of the line joining $aa1$, and the light line from A at $a2$, gives us the shadow point of A . Point $c2$, the shadow of c , will be the intersection of the line from $a2$ to the vanishing point, and the line of light from c .

For the shadow of the chimney on the crest of the roof, we will suppose that the point of meeting of the line 00 and the line from x , representing the angle of the roof, is inconveniently placed. We may take any other point—say, the point X on the line xX , and from this point X draw the lines from the vanishing points and the horizontal line from $x1$, meeting them at $x1$, $x2$. The shadow point of 0 will be 02 , and the shadow line of $0x$ will be $02x$.

To construct the shadow of the dormer window we will employ the second method (it would be good practice to verify the result by means of the first method). From x , the lower point of Ez , we have the line xx , representing the angle of the roof. From x on the eaves we draw the line xe to the left vanishing point, and find thereon the projection of Ez at e . A horizontal line from e meets the eaves at $e1$, the line from $e1$ through x , and meeting the line of light from E at $e2$, will give us $e2x$, the shadow line of Ez . Similarly for the shadow of point G , we find its projection on the roof plane at z , and draw zx , the slant of the roof, and by means of the line from x on the eaves to the vanishing point, we find the projection g of G on the horizontal plane. The horizontal from g will give us $g1$, and the line from this point through x gives us the point $g2$ on the line of light from G . The shadow of point f is found in a similar manner by means of its projection on the roof at f . We have thus $f2g2$, the shadow line of FG ; $f2H$ joined is evidently the shadow line of FH . Or the shadow of F may be more conveniently found by means of the first method, and the lines to the vanishing points from H . The student will easily find for himself the shadow of the slanting eaves against the gable by means of the constructional lines ab , bc , &c.

The construction of the shadows of the eaves of the house against the wall plane should present no difficulty, for it is simply a repetition of the last article for vertical lines, the points VV , &c., being contained by these vertical lines. V is a point on the vertical line Vv at a certain distance from the wall-plane Wv . We draw from any point on the vertical line Wv —say, the point w —lines from the vanishing points, and from the lower point V obtain a horizontal line, meeting the line from w at $V2$. The intersection of the vertical from $V2$, and the line of light from V gives us $V1$, the shadow point of V . The line $V1$, $V1$ from the vanishing point is therefore the shadow of VV . The shadow of the eaves at S and AA is found in a similar manner. The shadow of AA is, however, stopped by the projecting window board; we therefore first find the shadow as if thrown against the wall, and then the intersection of the plane of the shadow with the projecting board, giving us aa , the shadow of AA on the board. The student will construct for himself the shadow cast by the window-board. The shadows of the slightly projecting rafters are found by means of lines in the direction of the rays of light meeting the shadow lines already obtained of the eaves.

A new organ, built at a cost of £500 by Messrs. Harrison and Harrison, of Durham, was opened in the Baptist chapel, Idle, near Bradford, on Friday.

A large block of residential flats is in course of erection near the Minet Library, Knatchbull-road, Brixton. The floors are constructed of steel girders set in cement. Each set of three rooms, with a scullery and offices, is self-contained within a door opening from the central staircase. The Co-operative Builders are the contractors, and the property belongs to the Tenant-Co-operators' Company, Limited.

The Lord Mayor of London inaugurated on Monday the completion of the sea-front improvements at Rhyll, which have been accomplished by the Rhyll Commissioners during the past twelve months at a cost of nearly £10,000. The principal works have been the asphaltting of the promenade, the erection of several shelters and ladies' cloak-rooms, and the provision of a fountain in the centre of the esplanade.

At a meeting of the board of management of the Midland Deaf and Dumb Institution, held on Monday, September 5th, the Mayor of Derby in the chair, Mr. W. J. Phillips was appointed clerk of the works for the new institution now in course of erection in Friargate, Derby, at a cost of over £11,000. Mr. Phillips has had very considerable experience as a clerk of works, and is now engaged at a large mansion which is being erected in Maidstone under the superintendence of Messrs. A. Waterhouse, R.A., and Son.

The Aylesbury extension of the Metropolitan Railway, opened on the 1st inst., from Chalfont-road to Aylesbury, is 16½ miles in length, and has been built at a cost of £380,000, or £22,000 per mile for land and works, the price paid for land averaging £238 per acre. Mr. J. T. Firbank was the contractor. It reduces the distance between London and Aylesbury, hitherto 43 miles by the North-Western route and 50 miles by the Great Western, to 39 miles.

Building Intelligence.

BLACKPOOL.—Messrs. Maxwell and Tuke, the architects, report satisfactory progress of the works of the tower. Messrs. Neill have now completed their contract for the foundations of the tower and for the foundations of the brick keep surrounding the tower; and the contract for the superstructure has been let to Messrs. James Cardwell Brothers, of Blackpool, who will proceed at once with the work. Messrs. Heenan and Froude are proceeding rapidly with the preparation of the ironwork in the yard, and the actual erection of the tower pillars has been commenced. The first group of pillars, 55ft. in height, has indeed been completed, and the steelwork for the second group is on the ground.

NEWCASTLE-ON-TYNE.—The Station Hotel adjoining the Central Station has just been completed for the North Eastern Railway Company. It has a frontage of 310ft. 6in., and is five stories in height above the ground floor. It is Italian Renaissance of a severe type in style, and has been designed and carried out by Mr. William Bell, the N.E.R. Co.'s architect, the chief clerk of works being Mr. Richard Story. Burmantoffs faience from Leeds is largely utilised for decoration. The contractor for the whole building was Mr. Walter Scott, under whom the following sub-contractors have carried out the different classes of work:—The Leeds Fireclay Co., faience work; R. Hardman, Powell, and Co., Birmingham, balustrading; Benham and Sons, London, cooking and hot water, &c.; Messrs. Diespecker and Co., London, Roman mosaic work; Mr. J. F. Ebner, London, the parquet flooring; Messrs. Emley and Son, Newcastle, marble work.

CHIPS.

At Tuesday's meeting of the city council of Worcester it was decided to invite Messrs. T. and C. Hawkesley to submit plans and estimates for a sewerage scheme for the city.

Memorial stones of a Congregational manse were laid at Snodland, Kent, on Friday. Mr. Tomlin, of Snodland, is the contractor.

The foundation-stone of a new Congregational church at Ashton-on-Mersey was laid on Saturday last. The building will have seating accommodation for 350 persons, and will cost £2,000. The contract is being carried out by Mr. J. E. Dean from the designs of Mr. Thomas W. Cubbon, architect, of Birkenhead.

The foundation-stone of the free public library for Southampton was laid by Mr. James Lemon, F.R.I.B.A., the Mayor, on Wednesday week. Mr. E. J. Guy, of Portsmouth, is the architect, and Messrs. G. Scammell and P. H. Dowdell, of Portsmouth, are the contractors. The cost will be £3,500.

Contractors' men are now making preparations for sinking a trial cylinder in the Forth about 660 yards below the entrance to the river Carron, to ascertain the nature of the strata, with a view to preparing plans for a proposed new deep-water entrance and new docks for Grangemouth. The cylinder is to be sunk out in the channel at the depth of 15ft. at low water, and the work has been entrusted by the Caledonian Railway Company to Messrs. Lucas and Aird, Westminster, who are at present constructing the West Highland Railway.

The removal of the flagstaff upon the summit of the Round Tower turret at Windsor Castle, owing to its unsafe condition, was commenced early on Saturday morning. The flagstaff was erected about 1829. The height of the mast, which was of Norwegian pine, was upwards of 70ft., of which 52ft. was visible above the parapet. The new mast is to be supplied by the Admiralty, and will be erected upon the tower before the return of the Queen from Scotland.

The Roman Catholic Bishops of Scotland have decided to erect a new college at Blairs, to take the place of the present institution, St. Mary's College. The new college is to provide accommodation for 100 students, in addition to laboratories and classrooms, and quarters for the rector and professors. The cost will be about £20,000.

The Manchester city council resolved, on Wednesday, after a long discussion, that the recent report presented to them on the Ship Canal affairs, together with a letter from Lord Egerton of Tatton soliciting a further loan of at least one million and a half from the corporation to the Canal Company to complete the works, should be referred to the Ship Canal special committee of the corporation to investigate, and to report the terms and conditions on which they would recommend that the assistance should be rendered.

Engineering Notes.

ABERDEEN.—Extensive additions to the gas-works, estimated to cost £80,000, were sanctioned on Monday by the town council of Aberdeen. In order that the works may be carried out applications will be made to Parliament in the ensuing session for a Bill to authorise the Council to borrow an additional sum of £90,000 in connection with the gas undertaking. The Council had before it reports on the proposed works by Mr. Samuel Stewart, Greenock, and Mr. Alexander Smith, the Aberdeen gas manager. According to these, the bench containing 80 retorts, heated by the open furnaces, will be reconstructed, so as to contain 128 retorts on the regenerative system. This alteration will give retort power for about four years. The present gasholder capacity is 2,100,000cu.ft., while the largest daily consumption last winter was 2,300,000cu.ft., and to remedy this there will be erected an additional gasholder of at least 3,000,000cu.ft. capacity. Another retort-house, to contain 224 retorts, will be built alongside the present one; and an additional purifier-house, scrubbers, and condensers will be built as required.

THE INVERNESS AND AVIEMORE LINE.—The directors of the Highland Railway Company have resolved to proceed at once with the construction of the last section of the new direct line from Inverness to Aviemore and the south, the deviation and shortening of which recently received Parliamentary sanction. The new line is to commence at Inverness, and running up through Culloden wood, will be carried over the river Nairn by a stone viaduct of 570 yards in length, and from 58ft. to 129ft. in height. There will be 27 arches of 50ft. span, while the central arch will have a span of 100ft. The deviation line, which is over seven miles in length, will terminate at Culdoich, from which point to Carr Bridge large squads of workmen are at present engaged in the work of construction. From Inverness to the Nairn viaduct there will be a double line of rails; but beyond that point the line will be single. A station is to be erected near Culloden Moor. The first section of the line, from Aviemore to Carr Bridge, has already been opened.

SUNDERLAND.—The Marquis and Marchioness of Londonderry visited Sunderland on Friday for the purpose of placing a block in the Roker Pier, which is at present in course of construction for the river Wear commissioners. The length of the pier will be 2,900ft. It is six years since the foundation-stone was laid. The foundations are composed of huge bags of concrete, varying in weight from 56 tons to 116 tons. The superstructure is composed of huge blocks, some as heavy as 45 tons. Last year the commissioners decided to proceed with a pier 2,870ft. long, to protect the harbour from the south-east, which is now progressing satisfactorily. These two piers, when completed, will inclose a harbour having an area of 125 acres, with an entrance 600ft. wide, and a depth of water of 45ft. The total outlay on the scheme will be £400,000. Mr. H. H. Wake is the engineer.

The sub-committee of the town council of Edinburgh charged with the carrying through of the arbitration with the North British Railway Company regarding the price to be paid by the company to the corporation for the portion of the East and West Princes'-street Gardens, which have been appropriated for railway purposes, have resolved to claim £150,000 compensation. There are about two acres scheduled. The arbitration will come on for hearing in the first week of October. The Right Hon. Baron Shand is the umpire.

A bacon factory is in course of erection at Ashford, Kent. It is being carried out by Mr. Henry Knock, builder, of Ashford, and satisfactory progress has been made. The chimney shaft has already been commenced, and has been raised to a height of 10ft. The factory, which is under the supervision of Mr. Henry J. Jeffery, M.S.A., architect and surveyor, of Ashford, Kent, will stand upon a spacious site near the Victoria Mills, and a siding by the South Eastern Railway Company has been made.

The town council of Aberdeen resolved on Monday to proceed with the lighting of the eastern district of the city by electricity, at an estimated cost of £24,000, in accordance with the report of Prof. Kennedy, of London. About 7,000 lamps of eight-candle power will be provided.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 832, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and SIXPENCE for every eight words after. All Situation Advertisements must be prepaid.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL, XLII, XLVI, XLIX, L, LI, LIV, LVIII, LIX, LX, LXI, and LXII may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—F. G. and Co.—S. African.—B. S. M.—Thos. Geo. N.—G. R. and Y. B. Co.—P. D. (Dublin).

Correspondence.

SUITABILITY OF SITES FOR THEATRES.

To the Editor of the BUILDING NEWS.

SIR,—My attention has just been drawn to your report upon the evidence given before the Select Committee on Theatres, and in criticising my evidence you assume that I disregard the question of suitability of site.

In this you are wrong. The evidence I gave was that a theatre should be erected on a suitable site; but the first consideration, having obtained a site upon which a sufficient number of exits could be obtained, was that there should be every endeavour to make a building as far as possible fireproof, and I put this before the absolute isolation of a theatre site.

It was only upon this question of the absolute isolation that I considered there could be any disregard of the question of site, and in my evidence I clearly pointed out that there should be at least two sides open for exit purposes.

I trust that you will give me space to draw attention to these facts, as certainly your criticism does not fairly represent the evidence I gave, or my opinion as to the necessity for suitable sites of a theatre.—I am, &c.,

WALTER EMDEN.

105 and 106, Strand, London, W.C., Sept. 5.

THE GUILDHALL.

SIR,—I have read with interest your article in the BUILDING NEWS of last Saturday. There is one paragraph in it I should like to correct, as it might mislead. You say that the present roof over the Guildhall was designed by Horace Jones, "with the assistance of Digby Wyatt, F.S.A., and Edward Roberts, F.S.A."

This is scarcely correct. The roof was designed by Horace Jones, without any assistance; but Sir Digby Wyatt and Mr. Roberts were called in early in 1864 by the committee to advise as to whether or not the roof which had been designed by Mr. Bunning, the previous City architect, then recently deceased, and was already contracted for at the time of his death, was an "open roof" as intended by the committee, and was in accordance with the period of architecture of the hall.

The two gentlemen referred to went into the matter, and made a report to the effect that the roof did not answer these conditions, and upon that Mr. Horace Jones prepared the design for the present roof, Sir Digby Wyatt and Mr. Roberts having nothing whatever to do with it.

I enclose you a printed copy of the reports in the matter, which will show you exactly how the matter stood. These reports are accompanied by printed sketches showing what was believed to be the original roof (according to "Smith's Print") which was destroyed in the great fire of 1866; the flat-ceiling roof which existed down to 1864, the outline of the roof designed by Mr. Bunning, and which I have filled in more in detail for your information; and the existing roof as designed by Horace Jones.

I remember at the time a very interesting discussion took place on the subject of what form did the original roof take, a very great number taking the view in opposition to Sir Horace Jones, Sir Digby Wyatt, and Mr. Roberts, that Smith's print did not correctly represent the original roof, there being no evidence amongst the old remains to point to such a roof.

Mr. Charles Bailey, who was at that time chief assistant in this office, and well known as an archaeologist, always maintained, and I think with some show of reason, that the original roof of the Guildhall was carried by arches spanning the entire width, these arches supporting the purlins; and this discussion was revived at a meeting of the R.I.B.A. in either 1864 or 1865, when the late Sir Horace Jones read a paper upon the Guildhall.

It is perhaps of no great importance; but it is just as well that little matters of this kind should be known correctly.—I am, &c.,

A. MURRAY,

Guildhall, E.C., Sept. 7. City Surveyor.

BERGEN CHURCHES.

SIR,—Your versatile correspondent "Goth," in the current week's issue, refers to a new Norwegian church at Bergen, built entirely of paper. I happened, on my return homeward-bound a few weeks ago from a cruise in the Arctic regions, to spend a bright and happy day at Bergen, and noticed a large brick church with a western tower in course of erection there, but contrived to miss the paper church in question.

But even in Norway things are not always all they seem! For instance, I formed one of a very pleasant party at Bergen who drove out to Fjøsanger, a few miles distant, to see an ancient wooden church, which originally stood at Fortun, but some few years ago had the mis- "fortune" to be purchased by the resident American consul, Mr. Gade! He removed it to his own picturesque grounds, where it has been re-erected, and by its side, upon a mound, an interesting old granite cross—also evidently an acquisition!—has been placed. This cross is fashioned out of a roughly-hewn and very thin slab—the thinnest I ever saw in that material. It has an incised cross upon it, on one face.

As for the old church, judging from external appearances (we were not fortunate in getting inside), very little appeared to be original. It is built entirely of pine. Only the two doors and some panelling seemed to be any thing like Mediæval work. Both the former were got out of single planks—remarkably fine ones, and about 3ft. in width, with some rather nice ironwork upon them. The rest of the exterior of this quaint edifice did not seem to be anything like so old as myself; much was quite new, and daubed over with a sticky, treacle-like varnish.

My visit was of necessity of so superficial a character that I had really little opportunity for examining the church closely, and none, as already said, for seeing the inside at all.

Some particulars relative to this building would probably be read with interest by many, as well as by,—Yours, &c.,

Exeter, Sept. 3.

HARRY HEMS.

Intercommunication.

QUESTIONS.

[10842].—Composition for Renovating Stone-work.—Would one of your correspondents kindly inform me of some reliable composition for making good a stone garden-wall that has been affected by the frost?—J. C.

[10843].—Colour Washes on Parchment.—Will someone kindly inform me how to tint conveyance plans on parchment evenly and without cockling? Is there any special treatment, medium, or process required?—KORAX.

[10844].—Lightning Conductors, &c.—Can any one kindly give me sizes of lightning conductors usually used? Does difference of size depend on locality, whether on hill or in valley, or on size of building? Is there a graphic way of finding strains in the side-plates and lattice bars of a support for a weight of, say, two or three tons, or is there any formulæ? Support is of wood.—WILLIAM BOND.

[10845].—Paints.—Will some kind reader tell me how silicate paint is made—if ordinary white lead could be made into same by a mixture of silicate of soda? If so, how? Being situated in the opposite side of the world to where your favoured readers are, I cannot get the above information.—RANGON.

[10846].—Hydraulics.—Can the pressure on the piston of a hydraulic press be ascertained from the following particulars when the stroke of the ram or pump is not given; and if so, by what formula: Piston, 6in. diam.; pump-barrel and pipe leading to piston cylinder, 3in. diam.; pump, ram or piston, nearly 3in. diam.; lever operating ram, 4ft. 2in. long; ram, 2in. distant from the fulcrum; and force of 2cwt. to be applied at end of lever arm. From this the pressure obtainable seems to be 49cwt. per area of ram, or about 95cwt. per square inch at the pump.—PERPLEXED.

[10847].—Lime and Paint Stains on Slate Mantel.—Could any reader inform me of the best way of removing lime and paint stains from a polished black slate mantel and jamb, also on kitchen range? I can manage to get a few of the mortar patches off, but it leaves a mark in every case.—RANGE.

REPLIES.

[10833].—Timber and its Position.—It was stated in a recent American journal on carpentry that staves placed inversely to their natural direction in the tree lasted longer than where put in their natural position, though I am inclined to doubt the assertion. Perhaps some experienced reader on the subject will throw light and give reasons for such an assertion.—PHILO.

[10834].—Stresses in Cranes.—Draw lines to represent forces caused by the load on the jib-head; the resultant diagonal of parallelogram will represent the stress on jib. This stress is opposed by the jib and tie-rod. Draw a line parallel to the jib from the end of above diagonal, and another at its end parallel to the tie-rod, forming a triangle. Measuring the line parallel to jib, we find the compressive force coming upon the jib.—E. H. G.

[10835].—Electric Lighting.—Switches for turning the lamps on and off are conveniently fixed at the entrance to the room. In a bedroom it ought to be at the side or head of the bed.—ELECTROLIER.

CHIPS.

The syllabus of the classes of architecture, building construction, and modern practice at King's College, London, conducted by Professor Banister Fletcher, F.R.I.B.A., has just been published. The courses extend over three years, and are specially arranged for preparation for the progressive examinations of the Institute of Architects. The Michaelmas term opens on October 10th.

The city council of Gloucester have received a report from Mr. Fox, C.E., on the alternative schemes of water supply for the city. After seeing the confirmatory opinion of Mr. James Mansergh, C.E., he reiterates his previously-expressed recommendation, that the best course will be to bore in the newest red sandstone strata, failing which there is nothing, he thinks, for the city but to take its supply from the river Severn.

A memorial of the son of the incumbent has just been placed in the Church of St. Saviour, in Aberdeen-park, Highbury. It takes the form of a statue of our Lord as the Good Shepherd, executed a little under life-size in white alabaster, and standing under a carved canopy, on a corbel of stone. It has been executed by Mr. Harry Hems, of Exeter.

The Airdrie Dean of Guild Court has passed the plans for the erection of a suite of offices and board-room for the new Monkland Parochial Board on a site contiguous to the Free High Church in North Bridge-street. The premises are to consist of the inspector's offices and offices for the collector of rates, as also a board-room and other apartments in the upper story. The plans have been prepared by Mr. George Arthur, architect, Airdrie, and the estimated cost is about £1,200.

Building operations have been commenced for the erection of forty villa residences situated on the Rotton Park Estate, Birmingham. The total cost is estimated at about £15,000. The contractor is Mr. Edward Airey, of Gillott-road, and the architect Mr. J. Statham Davis, of 53, Newhall-street, both of Birmingham.

Legal.

A BUILDING CONTRACT.

THE courts of law have certainly gone as far as possible in enforcing the claims of a building contract against the builder, by whom it is often too lightly signed. But to charge a builder with stealing his own plant and materials because they were contracted to become the property of the prosecuting freeholders in certain events, is more than the law can stand. This, however, was attempted in the recent case of "The Queen v. Walters" (*Times*, August 7th), and a conviction was actually obtained at the West Kent Quarter Sessions, which has since been quashed by the Queen's Bench Division. It was an ordinary building agreement in the usual form, entered into between the freeholders of the land and the builder, under which the latter agreed to build certain houses. There was the customary proviso that the freeholders could take possession of the land on any default, and of the houses, and of all plant and materials thereon. It was admitted that they had not so taken possession when the builder removed his plant and materials, which he was now charged with stealing. It was contended on behalf of the prisoner that the agreement did not vest the plant and materials in the freeholders until they took possession under the forfeiture clause, and so there could be no larceny by the builder, as the things were his own property until that occurred.

The Queen's Bench Division made very short work of the conviction, and Lord Coleridge remarked that had not the case been actually reserved by a Quarter Sessions, it might have been thought impossible that such a construction could be put upon the agreement. They held that the forfeiture clause was in the nature of a penal measure to compel the builder to perform his contract. Under it the freeholders had power to re-enter and take possession of the land, and also the buildings, together with all materials, and even the plant and tools belonging to the contractors. When they did so take possession these things would become their property, and a charge of larceny for removing them after this could have been maintained. But the present conviction was based upon a construction of the clause by which the moment the plant and materials were brought upon the ground by the builder they would pass into the possession and become the property of the freeholders, who could therefore have at once seized and sold them, even though there had been no default. This construction proved too much. The Court accordingly quashed the conviction, as the builder could not steal his own plant and materials.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

PROVINCIAL.—BUILDING PLOTS.—This is not a question of law, but of professional practice, I should say, and one in which you might well consult an experienced architect and surveyor who has had to deal with similar difficulties.

C. O. S. AND S.—BUILDING CONTRACT.—The further facts now supplied modify this matter. But, according to these terms, I think the Board has a right to have a copy supplied to them, sealed up as agreed, and only to be used by them for comparison with final account. I do not see how that request, if so made, can be refused.

At a special meeting of the Stratford-on-Avon rural sanitary authority, held on Friday last, communications were received from the Local Government Board as to the alleged insanitary condition of Henley-in-Arden. It was decided to instruct Mr. J. E. Willcox, of Colmore-row, Birmingham, to prepare a general drainage and water scheme for the village.

The town council of Bury, Lancashire, who are threatened with legal proceedings under the Rivers Pollution Act of 1876, recently decided to proceed with a sewerage scheme at an estimated cost of £100,000 in order to keep the sewage out of the rivers Roach and Irwell. A poll of ratepayers was demanded, however, and these have proved adverse to the scheme by a majority of 800; but more than 2,500 papers were returned blank, and over 1,800 were not collected. The town council has therefore referred the matter again to a committee to report and offer recommendations.

LEGAL INTELLIGENCE.

ANCIENT LIGHTS.—JOHN G. JOICEY v. NORTH-EASTERN RAILWAY COMPANY.—This arbitration case was held in Newcastle-on-Tyne on the 3rd and 4th ult., the umpire being Mr. Robt. Vigers, of London, the arbitrators being Professor Banister Fletcher and Mr. Thos. Gow. For the claimant there appeared as counsel Mr. Cyril Dodd, Q.C., M.P.; as solicitor Mr. C. E. Cadle (representing Messrs. J. G. Wilson, Ormsby, and Cadle, of Durham); and as expert witnesses Mr. James W. Frazer, A.R.I.B.A., Mr. E. E. Clapham, Mr. John Fergusson, and Mr. W. S. Armstrong, of Newcastle. For the railway company there appeared as counsel Mr. Fletcher Moulton, Q.C., with, as junior counsel, Mr. Hugh Boyd; as solicitor Mr. A. Kaye Butterworth, the company's own solicitor; and as expert witnesses Mr. Chaffield Clarke, F.R.I.B.A., of London, Mr. Henry Carrick, Mr. Joseph Potts, and Mr. Geo. Irving, of Newcastle. This was a case in which the claimant's property containing the ancient lights is situated in Pottery-lane, Newcastle, having a 30ft. street between it and the railway company's Forth Goods Station. The railway company formerly had a wall opposite about 17ft. 9in. high, and in extending their goods station under statutory powers they pulled down this wall and erected their station to a height of about 52ft. The claimant claimed that this addition seriously affected the light to his premises. It was proved that the workmen engaged in the premises (which are occupied by an engineering firm) felt the loss of light to such a large extent that they could not work with comfort without the aid of artificial light, and then they were unable to execute the same quantity of work as was executed before the obstruction was there. The railway company called their witnesses to prove that with an alteration to the front of the building, which is 125ft. long, by setting back the first-floor wall 3ft. and inserting skylights to light the ground floor, all the light that was necessary could thus be obtained, and that the cost of such alterations would only be about £200. It was pointed out by the claimant that that amount was inadequate, as the same amount of floor space would have to be retained, therefore the back wall would have to be set back 3ft., and the roof and floors taken down, and replaced perhaps with new material. This alteration would, it was argued by claimant, cost about £2,500, and then not give the same light as before enjoyed. The claimant claimed £5,460 on the ground that, having prepared a scheme for the improvement of the property, in the form of warehouses, offices, and sample rooms, he was prevented from carrying it out, as the risk would be too great, seeing that the majority of the light which he required for the offices and sample rooms would be taken away, and that was the amount he had lost through having to abandon the scheme. The railway company argued that the scheme would not be interfered with to the extent that plaintiff set forth. The award was taken up by the railway company on the 26th ult., and was found to amount to £1,218.

NON-PARTY WALLS.—Messrs. Black and Son, builders, of Perry-vale, Forest-hill, were summoned to the Greenwich Police-court on Tuesday by Mr. Jolley, district surveyor of Sydenham, for "separating a building known as No. 22, Dartmouth-road, from an adjoining building known as No. 24, Dartmouth-road by a partition other than a party-wall constructed of brick, stone, &c., &c.," and also "for placing woodwork nearer than 4in. to centre line of party-wall between No. 24 and No. 26 adjoining, &c., &c." The premises in question are known as Nos. 22 and 24, Dartmouth-road, and were partially burnt down some five months ago, the inclosing walls still remaining. They consist of a large shop and a small shop, both communicating by a door, and over each shop are rooms accessible from each shop by two staircases, one in each shop. There was no communication between the two portions of the building on the upper floors. Each shop has an entrance from without. With respect to the second part of the summons, the wall in question divides No. 24 from No. 26 for a certain distance vertically, leaving a height of 5ft. of wall above this point, and which is utilised by No. 24 as an external wall, having in fact, a window (ancient lights) in it which overlooks the roof of No. 26, and 18in. above it. The alleged irregularities mentioned in the summons refer to the upper portion of this wall above No. 24. The case had been twice before adjourned, and Mr. Tolley had said that, in his opinion, Sec. 28, rule 1, and Sec. 27, rule 3, were sufficient in themselves to prove that the premises Nos. 22 and 24, were two buildings, and not one building, which was the real point at issue on the first part of the summons, and pointed out to Mr. Kennedy, the magistrate, that the plans showed two shops, and two separate entrances and staircases from without. The defendant's solicitor, Mr. Frank Wm. Brazil, contended that, in spite of what Mr. Tolley had said, the premises were one building within the meaning of the Act, inasmuch as there was an internal means of communication between

all parts thereof, and there would be no very great objection to having two, three, or even six doors in the alleged party-wall between Nos. 22 and 24, if the Act so required it; but submitted that, for the purpose of the Act, one door sufficed. Mr. Brazil also pointed out that the building was an "old building," inasmuch as one half thereof had not been taken down (Sec. 10), and that as the means of communication still existed between Nos. 22 and 24, and always had existed, it was outside the jurisdiction of the district surveyor to have it blocked up; the premises could not be held to be two buildings, and that no wall could be a party-wall with a door in it. Mr. Tolley, however, in answer to this, argued that all buildings were now buildings that were built after January 1st, 1856 (see sections 7 and 8), and that he would therefore be empowered to order the opening to be blocked-up. Mr. P. H. Adams, of the firm of Messrs. Adams and Mann, architects and surveyors, gave evidence to the effect that he had prepared the plans with a view to compliance with the Building Act. On the second point, as to whether a wall can be a party-wall below and an external wall above, Mr. Brazil pointed out that the definition of the word "party-wall" would prove that it could. The upper part was not "used" as a party-wall, nor "built in order to be used," as it had got an ancient light in it. The cases of "Cubitt v. Porter," and "Watson v. Arnold" were cited to strengthen this reading of the Act. Mr. Tolley, on the contrary, pointed out that a case had been tried at Greenwich Police-court some years ago, that was on all fours with this second point, and in which the magistrate shared his own present views of the case. On both points Mr. Kennedy reserved his decision until Tuesday, September 20.

WATER SUPPLY AND SANITARY MATTERS.

GLENGOWAN, N.B.—A special water supply has just been completed for the village of Glengowan, Caldercruix, by Messrs. John Spence and Sons, engineers, Airdrie, the contractors, for the Lanarkshire County Council. The supply is obtained from natural springs near the Edinburgh and Glasgow Road. The water is conveyed in a 2-in. cast-iron pipe, which crosses the lade at Caldercruix mills and the river Calder upon wooden beams, and then is carried to an iron gathering tank holding 16,000 gallons.

CHIPS.

Mr. Harry Simmonds, builder, of St. John-street, Monmouth, attempted to commit suicide by hanging himself to a beam in his workshop on Monday. The rope broke, and Mr. Simmonds fell a distance of 10ft., his head striking the stone floor. He is recovering.

Damage to the extent of over £500 was occasioned by a fire which occurred on Saturday at the residence of Mr. Richard Hansom, an architect, in Grove Park-terrace, Ealing.

A receiving order has been granted in the case of James Dolby Belham, trading as S. Belham and Co., of Buckingham Palace-road, S.W., builder and contractor.

The Accrington town council resolved on Monday to purchase the gas and waterworks for £713,220, being 33 years' purchase, subject to an expert's report being satisfactory, and also if the ratepayers approved.

The corporation of Colchester have purchased several meadows close to the centre of the town for the purpose of a public park, and they are now being laid out. Nearly a hundred men are engaged on the work, and it is hoped that it will be completed by the 1st of November. In the excavations which have been made, several Roman remains have been discovered.

The new Church schools, Chester, are being warmed and ventilated throughout by means of Shorland's patent Manchester Grates, and patent Manchester stoves, the same being supplied by Mr. E. H. Shorland, of Manchester.

A provisional committee interested in the projection for the erection of a new pier at the west end of Morecambe have decided that Mr. Harker, A.R.I.B.A., Manchester, the engineer for the new south pier, Blackpool, together with Mr. Butler, of the Stanningley Ironworks, should be empowered to make a survey of the two suggested sites—opposite Regent-road and the Battery Inn—and to submit approximate estimates of the relative cost to an enlarged committee appointed at the meeting.

A corner plot in Pilgrim-street, Newcastle-on-Tyne, has just been covered with business premises, Renaissance in style, and five stories in height. Mr. James T. Cackett, of Grainger-street, Newcastle, is the architect, and the chief contractor was Mr. John Ferguson, of the same city. Messrs. Ewart, of London, carried out the copper domical roof to the angle turret at the junction of the street façades.

Our Office Table.

IN contributing to a correspondence in the daily papers on the alleged discovery in Russia of some duplicate cartoons by Raffaele, Sir J. C. Robinson, Her Majesty's Surveyor of Pictures, states that these are only copies, executed a century and a half after the originals, and from the tapestries in Rome. He points out that fine series of the tapestries, made at Arras in the 16th century, exist at Ford Abbey, Somerset, now owned by Mr. Herbert Evans, and in the Museum at Berlin; while many other sets and isolated examples, varying greatly in degree of merit, exist elsewhere, as for at least 150 years after the execution of the original series the tapestries were reproduced by manufacturers in every country. Sir John Robinson again offers his protest against the decision of the Parliamentary Commission, appointed last year on his initiative to inquire into the state of the cartoons at South Kensington, to retain them in that institution; he holds strongly that the cartoons should be returned to Hampton Court, as in the smoke-laden atmosphere of London their progressive deterioration is certain.

A new school of applied art in Edinburgh, established under the auspices of H.M. Board of Manufactures for Scotland, for the purpose of imparting to craftsmen a knowledge of art design as applied to industries, will be opened on the 17th October. Some eighteen months ago a number of those directly concerned in the application of art to industries, feeling the necessity of systematic education beyond what can be obtained in the workshop, took the matter up in the hope of doing something "to remedy the present unsatisfactory state of things." What they suggested was a practical development of the instruction given in Edinburgh at the Royal Institution or at the Heriot-Watt College. The Board of Manufactures, whom they approached in the first place, while viewing the project favourably, pointed out that the money at their disposal was barely sufficient for the work they had on hand. The promoters thereupon opened a subscription list, and a sum of about £1,400 was subscribed, to which was added £1,000 contributed by the town council out of the residue grant. The Board of Manufactures have undertaken to manage the classes, and, in anticipation of the opening next month, the joint committee, under whose superintendence the school is conducted, have instructed Dr. Rowand Anderson and Mr. Alexander Inglis, secretary to the Board, to purchase an outfit and acquire examples. For this purpose these gentlemen started on Monday last for London, Paris, and other cities. The basis of the teaching is foreshadowed as "an education in common" in Classic, Renaissance, and Mediæval arts.

The Birmingham Municipal School of Art stands this year at the head of competing schools in the kingdom, having gained a larger number of prizes than any other. Its students have obtained at the National competition two gold, eight silver, and 15 bronze medals, and 27 book prizes, in all 52. Manchester comes second with 48 awards, receiving no gold medal and six silver ones. Glasgow comes third with 23, and South Kensington fourth with 17, but in the latter case it should be noted the students who are in training for art masterpieces do not compete.

VERY bad reports reach us as to professional prospects for architects and the state of the building trades in the Australian colonies. An old and valued correspondent of this journal, who has peculiar facilities for judging of the state of the labour market throughout Australasia, writes us from Sydney: "Things are in a terrible condition over here at the present time—the combined results of unprincipled and 'barm' swindling, the attitude of the labour party and the strikers and the cursed Protection, which even New South Wales has been saddled with for the last six months. A past president of the Victorian Architectural and Engineering Association, on a visit to Sydney, told me the other day, 'In Melbourne we've got no money at all—nobody has: all we can do is to live upon one another, and all we've got to do it with is credit.'"

COMMENTING on the recent protest of the town council against the unsatisfactory state into which the War Office has allowed Stirling Castle to fall, a correspondent of the *Scotsman* says:—"Stirling

Castle is a flagrant case of the effects of official vandalism and pernicious utilitarianism. It has been necessary or convenient to maintain it as a military station, and the ancient buildings have been patched and carved in the most remorseless way to gratify the desire of the War Office authorities to do things on the cheap." The Palace itself, a work of James V., has suffered less than other portions, having been occupied as barracks for nearly a century; but the still older Parliament Hall and the Chapel Royal have been reroofed and are used as a canteen and store-houses. The present Secretary for War, Mr. Campbell-Bannerman, who has been member for the Stirling Burghs for a quarter of a century, ought to signalise his reappointment by rescuing the castle from its present condition of sordid neglect.

THE city council of Liverpool will seek powers next session for a new local Building Act. The measure will provide powers so that, after the passing of the Act, the use of any building as a public building or warehouse building, which was not used for such a purpose before the passing of the Act, shall be deemed to be the erection of a new public building or warehouse building, so as to bring it within the provisions of any act or by-law applicable to new public buildings or warehouse buildings. Also, that any alteration, addition, or other work carried out in any old building, or in any new building after the roof has been covered in, shall, to the extent of such alteration, or addition, or other work, come under the provision of any acts or by-laws in force for the time being within the city. Also, that it shall not be lawful to erect any hoarding or similar structure to be used for advertising purposes, in, or abutting, or adjoining, any street, of a greater height than 15ft. above the level of the street, without the consent of the corporation, subject to certain conditions. The provisions of this clause are only to apply to hoardings forming structures in themselves, and not to hoardings fixed against walls of houses and buildings. Existing hoardings are to be subject to the new provisions after five years. Powers are also sought with regard to sky signs similar to those recently obtained by the London County Council.

If the statistics given in the San Francisco journals, and quoted without comment by the *American Architect* are reliable, the chimney shafts attached to manufactories and foundries do not attain very lofty dimensions in the United States. It is claimed for a shaft now in course of construction for the Edison Electric Light Company in Jessie-street, San Francisco, that it will be "the largest chimney on the Pacific Coast, and the third in point of size in the United States." The total height, however, of this shaft is but 175ft. above the pavement, with a diameter of 18ft. 6in. at the base, and of 14ft. at the cap. Such a flue is but a pigmy as compared with those attached to Thames-side cement works.

At the Railway Congress recently held in St. Petersburg, a statistical table showing the lines open in the different quarters of the world was presented. This table shows that their total length at the beginning of this year was 385,803 miles, of which 167,755 are in the United States, 14,082 miles in Canada, and 5,625 miles in Mexico and the Argentine Republic. In Europe, the German Empire comes first with 26,790 miles, France second with 24,310 miles, Great Britain and Ireland third with 22,685 miles, and Russia fourth with 19,345 miles. In Asia, apart from the 16,875 miles of lines in India, the Transcasian line recently constructed by the Russians is 895 miles in length, the Dutch colonies have 850 miles of railway, the French 65, and the Portuguese 34; while there are 125 miles of lines in China, and 18 in Persia. In Africa, the colonies of Algeria and Tunis come first with 1,940 miles, the Cape Colony second with about 1,880 miles, Egypt third with 965 miles, and Natal fourth with 341 miles; while the Orange Free State has 150 miles, and other minor States about 300 miles. In Australia, the figures are 2,703 miles for Victoria, 2,275 miles for New South Wales, 1,645 miles for Queensland, 1,875 miles for South Australia, 515 miles for West Australia, 401 for Tasmania, and 1,950 for New Zealand.

THE St. Louis Waterworks main conduit is of tunnel-shaped section, with vertical side walls and a semicircular arch of 4½ft. radius, making a 9ft. conduit. The invert is segmental, of granitoid upon a concrete bottom, which concrete extends

on each side of bricks as a backing to the side walls and ducts. The 11ft. conduit is of similar construction. The brickwork is of three rings to the 9ft. conduit, of hard-burned red brick laid in Portland-cement mortar 2 to 5. The concrete backing is made of 2½in. broken limestone, river sand, and Portland cement, in the proportion of 10, 5, and 2, laid and rammed in beds of 6in. thickness.

The Architectural Association.—September 17. Sixth Summer Visit to Loseley Park (by kind permission of Mr. More Molyneux and Gen. Palmer) and Guildford. Train 1.55 p.m. from Waterloo (Central Station). Members will kindly obtain their own tickets. Further particulars may be had of Mr. F. T. W. Goldsmith, 1, Verulam-buildings, Gray's Inn, W.C.

ERNEST S. GALE

F. T. W. GOLDSMITH

Hon. Secs.

Trade News.

WAGES MOVEMENTS.

AMALGAMATED SOCIETY OF CARPENTERS.—In the September issue of the organ of this society, issued on Wednesday, members are requested to keep away from the following places pending a settlement in these towns: Belfast, Dover, Lancaster, Leith, and Waterford. Also to call upon the B.S. before seeking work in Widnes.

THE BUILDING TRADES FEDERATION.—A meeting was held at Wimbledon on Sunday morning, under the auspices of the Federation of Building Trades, Mr. Johnson (Amalgamated Society of Carpenters and Joiners) presided, and the meeting was addressed by Mr. Verden (secretary), Mr. Barnes (Amalgamated Society of Carpenters and Joiners), Mr. Stephenson (general secretary of the United Builders' Labourers), Mr. Hubble (Operative Bricklayers' Society), and others. The necessity for combined effort by workmen in the outlying districts was pointed out in order that the promised advance of wages on November 1 might be carried out. A resolution was carried, calling upon all men engaged in the building trade to join the Federation.

CARDIFF.—The strike in the building trades at Cardiff still continues. The plasterers' delegates have had a conference with the Master Builders' Association, but were unable to come to terms on the questions of piecework and wages. The operative plumbers have met a joint-committee of master builders and plumbers, but without result, the men refusing to accept 8½d. per hour, the maximum offered by the masters. A similar failure attended the bricklayers' conference.

HAWICK.—The operative masons have come out on strike in consequence of the employers having failed to recognise the rules of the Operative Masons' Society of Scotland, a branch of which was recently formed in Hawick.

HOLYWELL.—The joiners have given notice to their employers of a demand for an increase of 2s. per week in wages, and a reduction of 2½ hours per week in hours of labour. The notice expires on the 17th inst., and the men state that they will go out on strike unless their demands are conceded.

NORTHAMPTON.—The bricklayers' strike has been settled, and the men have returned to work, a farthing rise being given at once, and a second farthing, raising the rate to 8d., being promised on and after November 5th next.

A new church, to be dedicated to St. Clement, is about to be built on Banker's Hill at Bradford as a memorial of the late Viscountess Mountgarret, at the cost of her daughter. Mr. E. Prioleau Warren, of London, is the architect, and the outlay will be about £12,000.

A new vicarage and stables have just been built at Verwood, Dorsetshire, at a cost of about £6,600. They have been erected from the designs of Messrs. Adye and Adye, M.M.S.A., of Bradford-on-Avon. The walls are built hollow, and faced with red brick, with Westwood stone dressings. The roofs are covered with dun-coloured tiles. The inside and outside decorations were carried out by Messrs. Cotterell, decorators, Bristol; the gardens were laid out by Messrs. D. Steward and Son, Bourne-mouth; and the contractor for the buildings was Mr. George Moore, of Trowbridge.

A Parliamentary paper relating to Building Societies just issued gives particulars relating to 1,237 societies in England and Wales. Of this number 26 terminated in accordance with their rules, 181 were dissolved under their own rules, 410 were dissolved by instrument, 38 were wound up, 84 were united with other societies, 32 transferred their engagements to other societies, and, with respect to 466, letters addressed to them were returned through the Post Office as "not known," or irregular intimation was sent to the Government office that the society had been dissolved or was abortive.

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TENDERS.

Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

ALDGATE.—For building warehouse at rear of the Three Nuns Hotel, Aldgate. Mr. R. A. Lewcock, 88, Bishopsgate-street Within, architect:—
Gill Bros. (accepted) ... £1,800 0 0

AUDENSHAW.—For flagging and curbing part of Audenshaw-road, for the Audenshaw Local Board. Mr. J. H. Burton, Ashton-under-Lyne, surveyor:—
Marland, F., Ashton ... £380 0 0
Storer, T., Denton ... 346 0 0
Boardman, A., Higher Openshaw ... 323 3 9
Underwood Bros., Dunkinfield ... 321 9 4
Worthington and Pownall, Manchester 312 13 11
Surveyors' estimate ... 311 10 9
Kinder, H., Hooley-hill (accepted) 308 9 1
Brierley, J., Ashton ... 324 4 2½

BIRMINGHAM.—For the restoration of the ring of ten bells at St. Philip's Church:—
Barwell, J., Birmingham (accepted).

BOURNEMOUTH.—For building National schools in Gladstone-road:—
Hoare, W. (accepted) ... £1,535 0 0

BRIXTON, S.W.—For the erection of a detached residence in Burton-road, Brixton, for Mr. Harry Grover. Mr. M. V. Treleaven, Acre-lane, Brixton, S.W., architect and surveyor:—
Courtney and Fairbairn ... £1,150 0 0
Maxwell (Limited) ... 1,099 0 0
Rice and Son ... 1,075 0 0
Smart and Son ... 900 0 0
Cowper ... 785 0 0

BRIXTON, S.W.—For new roof and lantern-light to warehouse at rear of 148, Brixton-hill, for Mr. Thomas Lighton, Mr. M. V. Treleaven, Acre-lane, Brixton, S.W., architect and surveyor:—
Freight, J. (accepted) ... £104 0 0

BROMLEY, KENT.—For additions of billiard-room, conservatory, kitchen, &c., to Nettlestead, Sundridge-avenue. Mr. Ernest H. Abbott, 6, Warwick-court, High Holborn, W.C., architect. Quantities by Mr. A. Johnson, 50, Imperial-buildings, Ludgate-circus, E.C.:—
Arnaud and Sons ... £1,092 0 0
Hall, Beddall and Co. ... 1,070 0 0
Grady ... 1,040 0 0
Bowyer ... 997 0 0
Crossley ... 995 0 0
Lowe ... 958 0 0

BURY, LANCs.—For painting buildings and railings at the Rochdale-road recreation grounds, for the town council:—
Lomax, J. and S. (accepted).

BURTON-ON-TRENT.—For various works at the maltings, &c., in Park-street, for Messrs. J. Bell and Co., brewers. Mr. R. Stevenson, Imperial Chambers, Burton-on-Trent, architect. Quantities by the architect:—
Hodges, G. ... £193 0 0
Hunter, J. and C. ... 186 5 0
Edwards, H. (accepted) ... 178 0 0
All of Burton-on-Trent.

BURTON-ON-TRENT.—For the erection of a new public-house in Blackpool-street, Burton-on-Trent, for Messrs. Charrington and Co., brewers, Burton-on-Trent, architect. Quantities by the architect:—

Varlow, J. ... £1,420 0 0
Hodges, G. ... 1,379 0 0
Edwards, H. ... 1,360 0 0
Lowe, T., and Sons (accepted) ... 1,350 0 0
All of Burton-on-Trent.

DARLSTON.—For the removal of old cottages in Blackmore's-lane and putting the thoroughfare in order, for the local board:—
Lees (accepted).

DAYBROOK.—For additions to the Daybrook laundry, Daybrook, Notts, for Messrs. Robinson Bros. and Co. Mr. W. H. Higginbottom, King John's Chambers, Nottingham, architect. Quantities by the architect:—

Maule, W. ... £481 0 0
Greaves, J., Arnold ... 467 0 0
Hind, E. ... 459 0 0
Wheatley, J. ... 457 10 0
Vickers, H. ... 457 0 0
Shaw, J. ... 450 0 0
Herring and Jew, Arnold (accepted) 420 3 0
Rest of Nottingham.

HANLEY.—For the erection of a higher grade board school:—

Godwin, T., Hanley (accepted) ... £10,550 0 0
(Lowest of ten tenders received, the highest being £13,102.)

HIGH BARNET.—For alterations and additions to the Red Lion Hotel, High Barnet, for Mr. Sydney Evershed, M.P., brewer, Burton-on-Trent. Mr. R. Stevenson, Imperial Chambers, Burton-on-Trent, architect. Quantities by the architect:—

Marriott, H. J., High Barnet ... £1,550 0 0
Austin, W., West Barnet ... 1,452 0 0
Baughen, J., Barnet ... 1,375 0 0
Pearson, M., Barnet ... 1,325 0 0
Allen, C., and Son, Barnet (accepted) 995 0 0

HOLYHEAD.—For the erection of a county police-station at Holyhead, for the Anglesea police committee:—
Williams, D., Carnarvon ... £3,157 0 0
Williams, W., Holyhead ... 2,769 0 0
Williams, D., Carnarvon ... 2,700 0 0
* Accepted.

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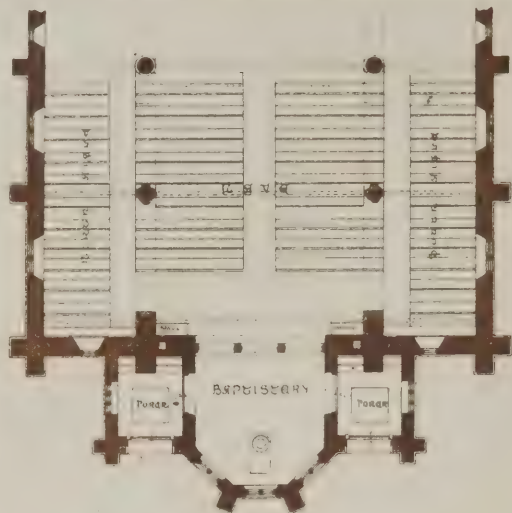
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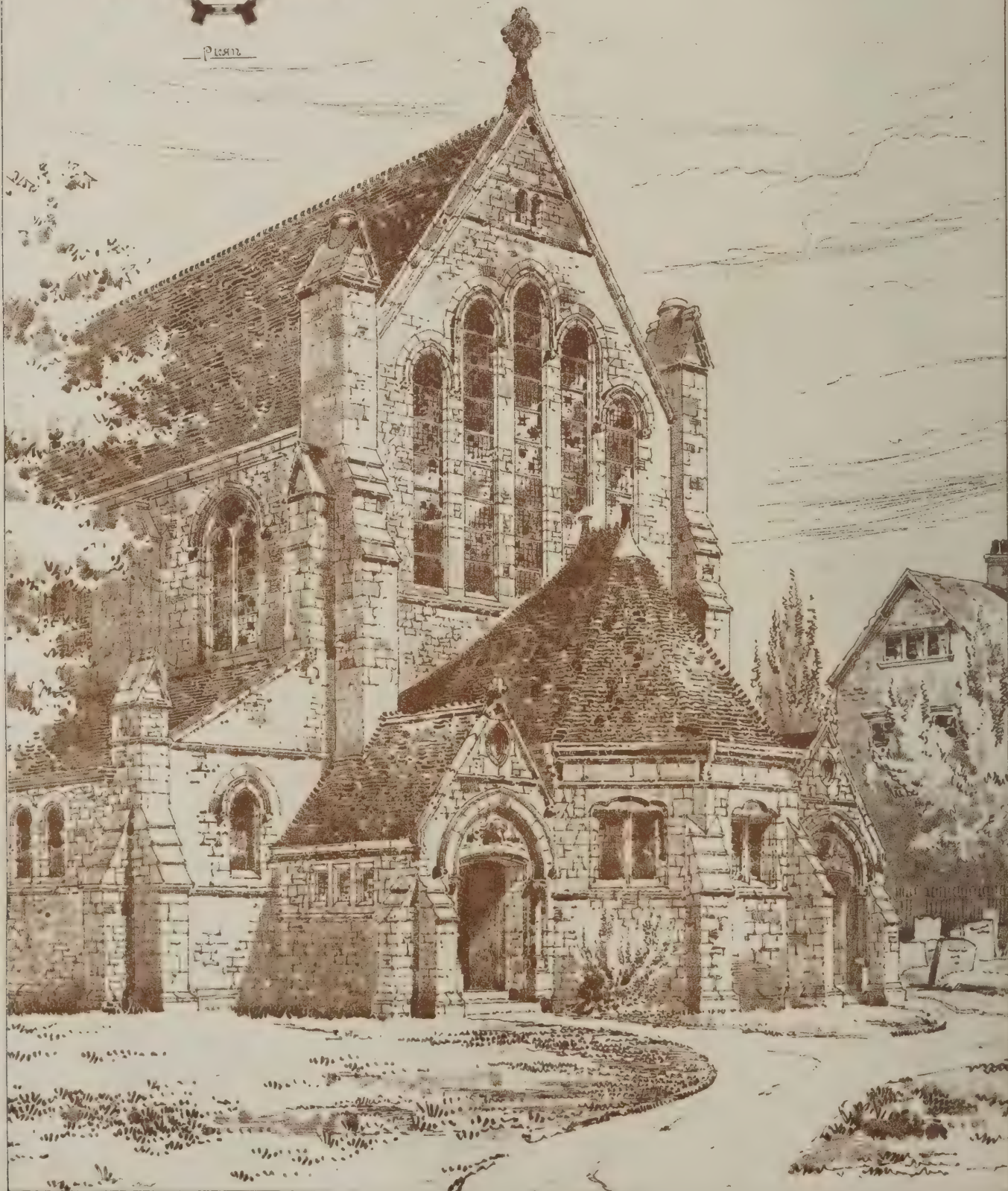
CHURCH

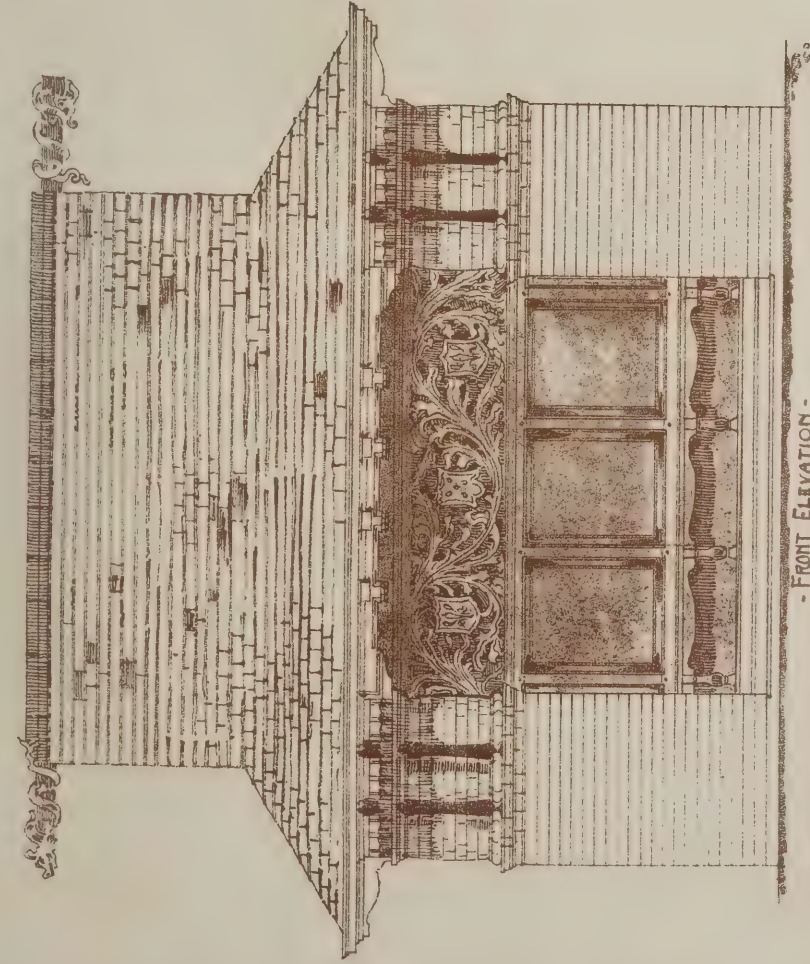
West Durban

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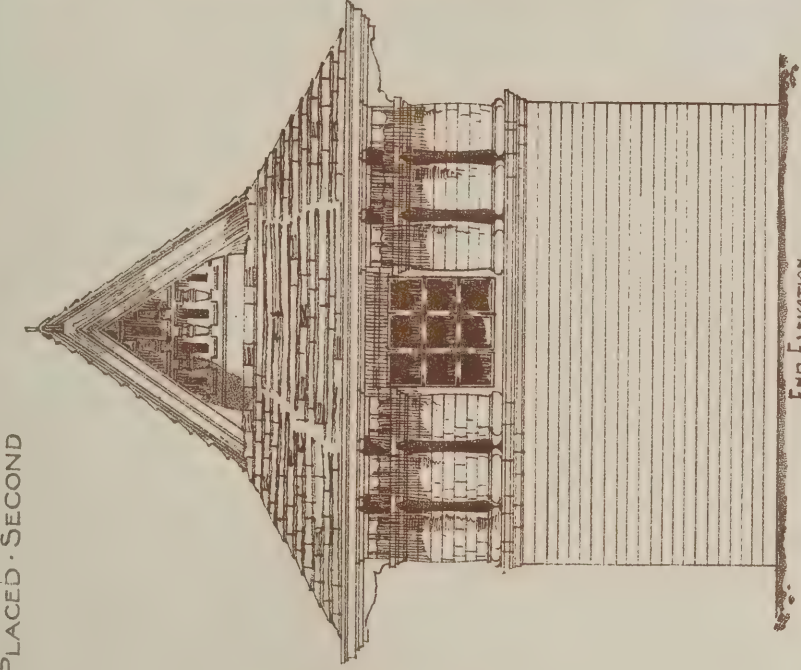
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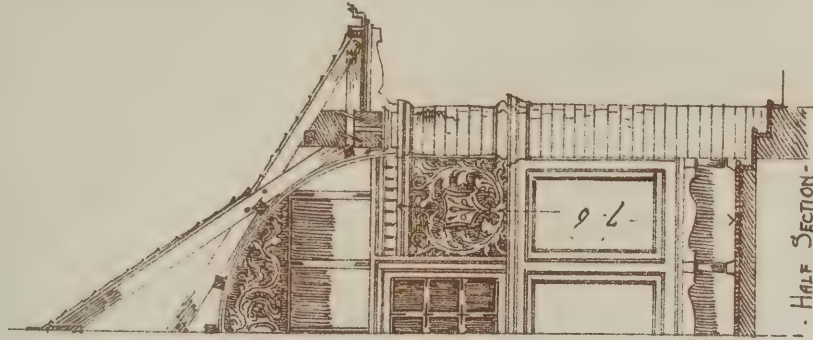


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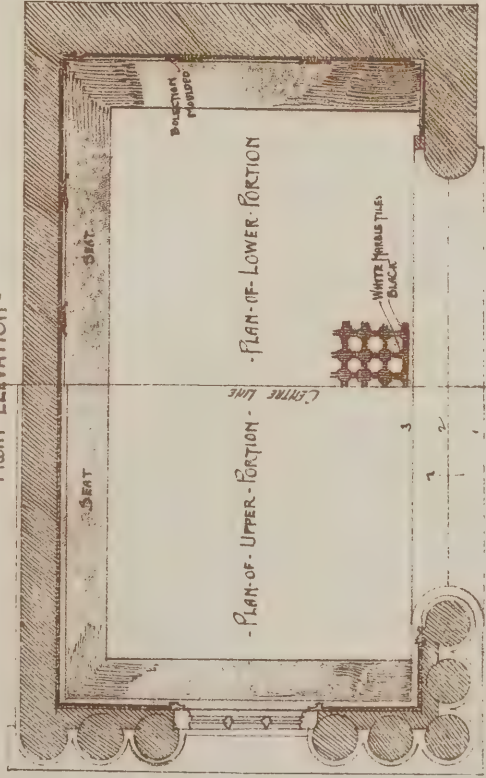
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END ELEVATION



HALF SECTION



PLAN OF LOWER PORTION

PLAN OF UPPER PORTION

CEILING LINE

SEAT

SIDE

BRICKWORK

WHITE MARBLE TILES

BLACK

B.N.D.C.

A BRICK SUMMER HOUSE

BY "SMILASH THE GOTH"

APRIL 1892

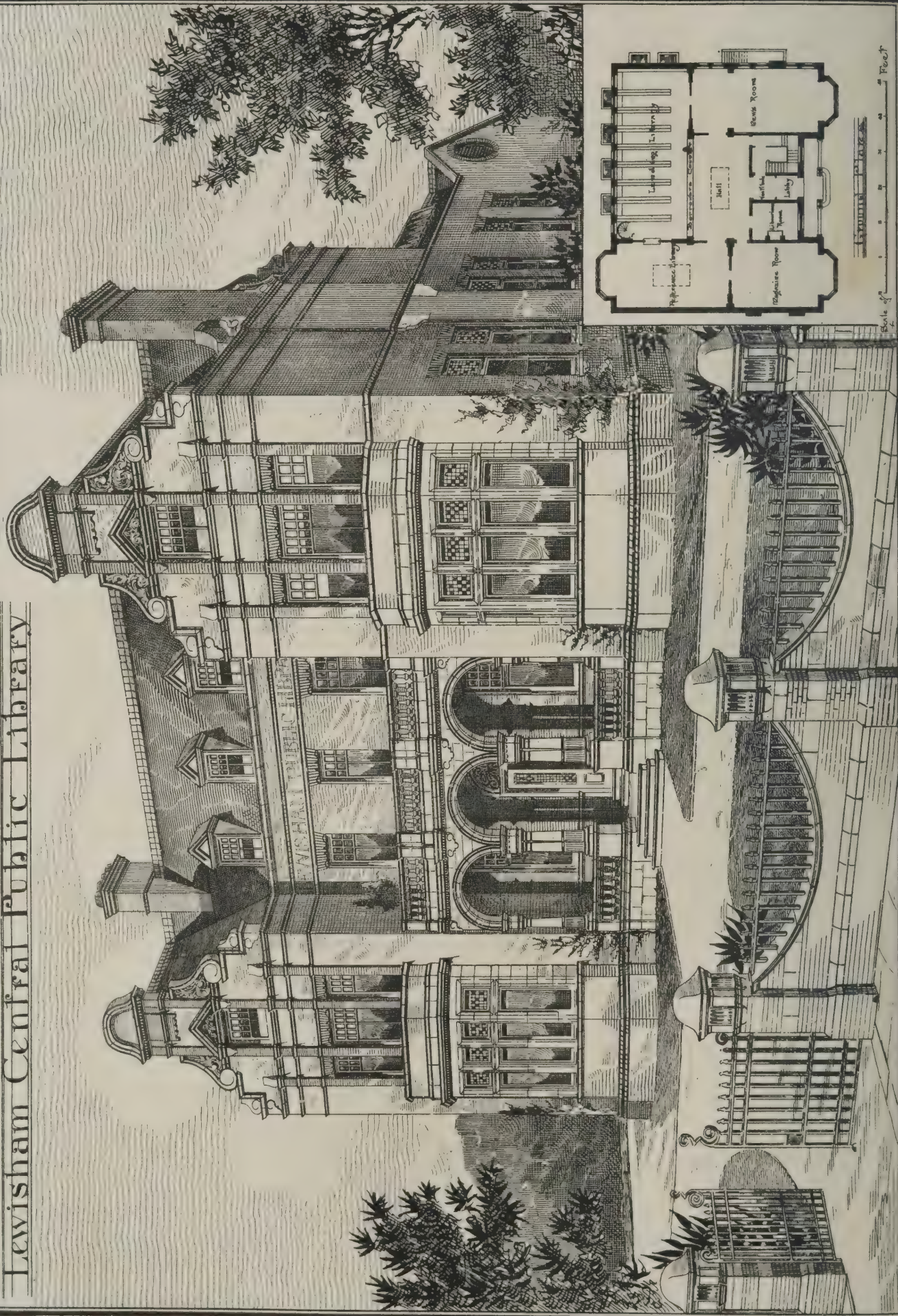
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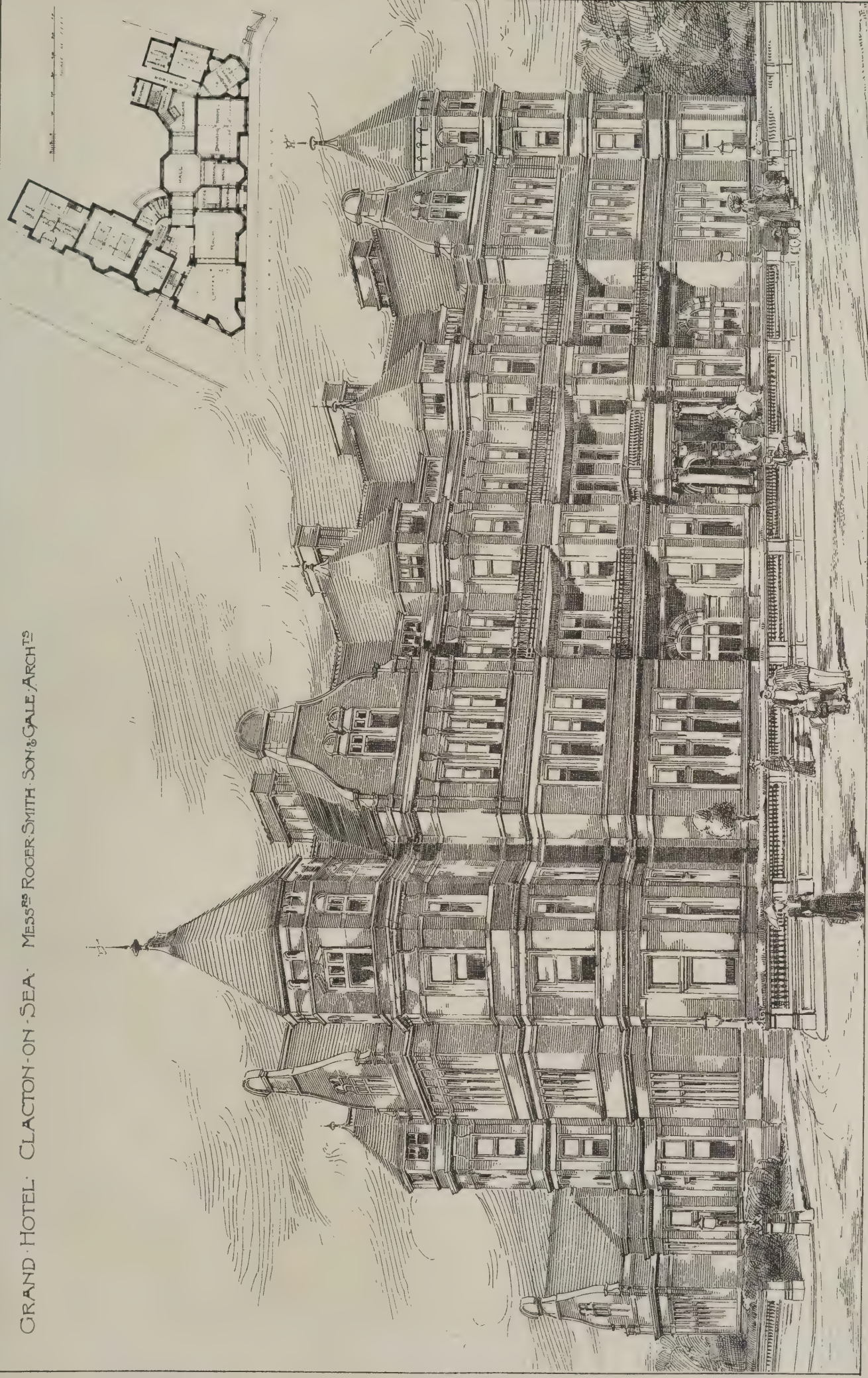
SKETCH

THE BUILDING NEWS, SEP. 9, 1892.

Lewisham Central Public Library



GRAND HOTEL CLACTON-ON-SEA. MESSRS ROGER SMITH, SON & GALE, ARCH^{TS}



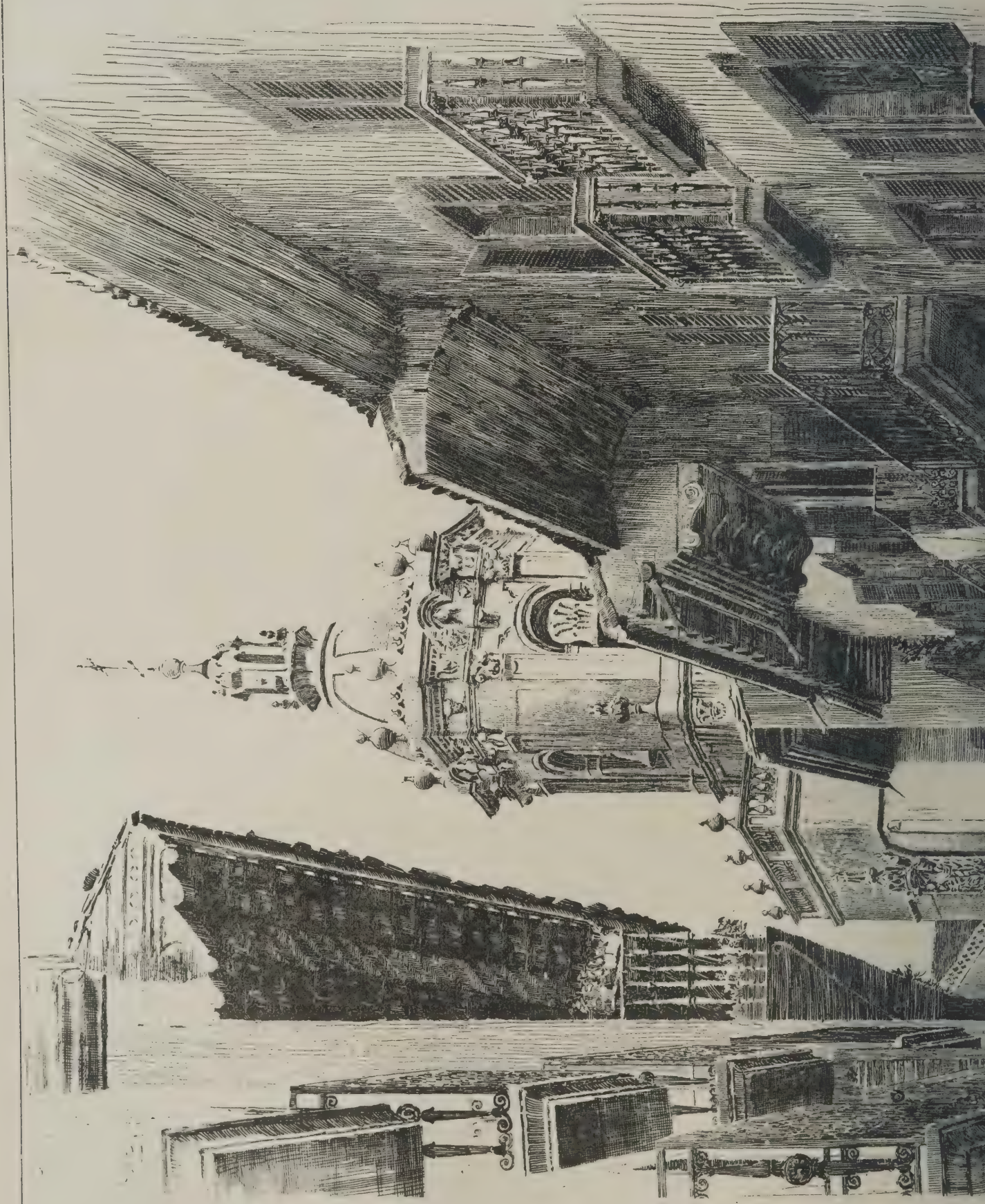
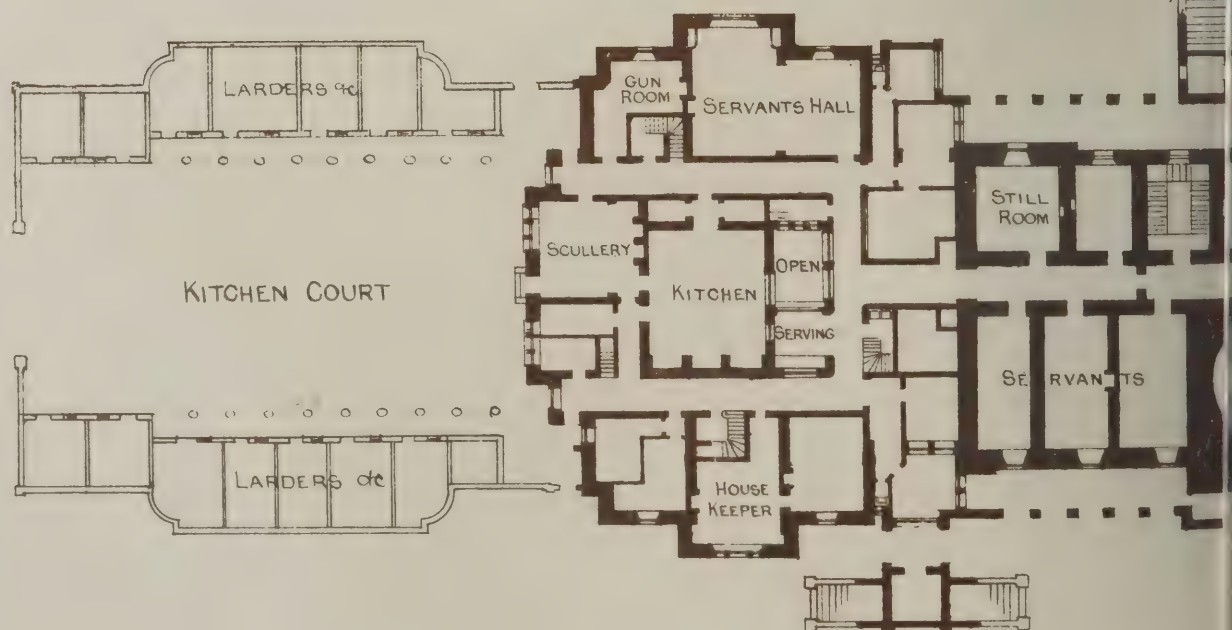




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CALLE MAYOR · FUENTERRABIA · BY T. J. DALGLISH ·



PLAN OF FL

SCALE

GOSFORD HOUSE N.B. AS COMPLETED BY WM YOUNG ARCHT. THE OLD PART BY THE BROTHERS ADAM.



GROUND LEVEL

10 20 30 40 50 FT

THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1967.

FRIDAY, SEPTEMBER 16, 1892.

THE MANCHESTER TECHNICAL SCHOOL COMPETITION.

THE designs for the proposed Municipal Technical School, to be erected on a site given by the legatees of the late Sir John Whitworth, Bart., for which the Corporation of Manchester invited architects to compete in April last, have been on view at the Municipal School of Art in Cavendish-street in that city. The instructions issued to competitors required accommodation for thirteen different departments—viz.:—1, Administration; 2, Mechanical Engineering; 3, Applied Physics and Electrical Engineering; 4, Textile Trades; 5, Applied Chemistry; 6, Dyeing and Finishing; 7, Brewing; 8, Metallurgy; 9, Building Trades; 10, Letterpress and Lithographic Printing; 11, Industrial Design; 12, Commercial Subjects; 13, Women's Work. These departments necessitated a large number of rooms in each case, and involved five or six stories. The accommodation asked for in the shape of floor space is very large, and must have entailed much labour in providing for the several departments, especially as they had to be distributed according to the requirements of each science and trade. The rooms were to be easily accessible without passing through one room to another. Those intended as laboratories and workshops and for the machinery had to be provided in reference to the fixtures necessary, some of them requiring—as in the laboratory for testing machines, and for magnetic and electrical experiments—to be placed in the basement. Each department had to be self-contained, arranged with a general eye to supervision, and placed conveniently near other departments; the rooms for students and class-rooms were to be well lighted, with a left-hand light if possible, the rooms and corridors had to intercommunicate, be well lighted, ventilated, and warmed. One main entrance with spacious vestibule leading to a hall for the exhibition of models and other objects, and a staircase leading therefrom to a large hall above, to accommodate 900 persons, were required, besides offices for the administrative department, staircases for students, and lifts, electric lighting, &c.

These various requirements left little room for architectural display, and the elevations submitted with most of the designs show that the competitors had enough to tax their resources in the plan, which left them very little scope for architectural disposition, in many instances the external design exhibiting very commonplace features. In fact, a technical school on a limited site is certainly not a very promising building for the architect's imagination, or one that is suggestive of artistic possibilities. The site at the corner of two main streets—Sackville-street and Whitworth-street—is a quadrangle well adapted to give an imposing building, as it is bounded on the two other sides by Rifle-street and Granby-row. The main angle is rather obtuse; but this irregularity has been avoided by some of the designers setting back the Whitworth-street frontage to a line at right angles to Sackville-street. Many have made the latter street the main front, being the longest; others have adopted Whitworth-street, and the term "rear" would therefore be given to the Rifle-street boundary, which was suggested for the physical laboratory. The approximate superficial area for the departments was given at 144,400sq.ft., and the cost was not to exceed £75,000. The authors

of the first premiated design have cubed their buildings at 6d. a foot, and their estimate is £85,000.

The four designs which have been awarded, and of which we published the authors' names last week, are four of the best as regards plan, but scarcely equal to the artistic ability shown in others not premiated. The design of Messrs. Spalding and Cross, which receives the first premium, has a plan which shows considerable skill and compactness in general grouping; but it lacks in the provision made for the heavy machinery, and the benches for those delicate instruments required in making magnetic and electrical experiments, which require perfect freedom from all vibration and other disturbing causes. For instance, the advanced laboratory is placed on the ground floor facing Granby-row, and is without the means of securing so desirable a condition, the foundations not being shown for the benches. The basement floor would certainly have been the right place for apparatus and fixtures of this kind. We also query the lighting of the spinning room, as shown by the section, the windows being obtained over the weaving-room shed, which is parallel to it. The workshops are lighted through glazed roofs of areas. The authors have not very clearly shown how the shafts and belting are to be arranged for working the machines. The ground-plan forms a double quadrangle divided by a central axial block running from Sackville-street to Rifle-street. This comprises the main entrance and vestibule in Sackville-street, a hall for large objects divided by columns into bays, and at the Rifle-street side a grand staircase with cloak-rooms under. The Sackville-street block, besides the entrance, has the clerks' rooms and committee-room on the left of entrance, and the mechanical laboratory and telegraphy room on the other side. The return block in Whitworth-street is devoted to mechanical engineering, the drawing office being at the corner. The Rifle-street and Granby-row blocks are given to applied physics, having the elementary laboratory in the centre of latter, the advanced at the Rifle-street end, and telegraphy at the Sackville-street corner. Thus the administration is represented by the exhibition hall block in the centre and one half of the Sackville-street block; the Whitworth-street block is given to mechanical engineering; while applied physics comprises the rear and the other two sides of the quadrangle. Towards Whitworth-street the oblique frontage has been utilised by breaking forward the drawing office, at the end and one lecture room. The two internal courts are surrounded by corridors 9ft. wide, which very properly are continued through the blocks for light and ventilation. At each of the four main corners is a block projecting into the area comprising a students' staircase and lavatory, thus giving students immediate access to their departments. The corridors are wide, and lighted from the areas as well as from the end. The entrance hall and museum form a direct communication from main entrance to the main staircase in Rifle-street. On the first floor the lecture and examination hall is placed over the central museum, approached by the main staircase. The administration department occupies the same blocks as below, the building trades are placed along Whitworth and Rifle streets, and the dyeing and finishing department along Granby-row and Sackville-street. The reading-room is over the main entrance, with library and technical instruction rooms in connection. On the second floor the commercial subjects are provided for in front and Granby-row; applied chemistry with lecture-rooms towards Whitworth-street, a gymnasium with dressing-room and kitchen offices, &c. On the third floor over centre hall are the laboratories for qualitative and quantitative analysis, also rooms for industrial design and

metallurgical departments; and on the fourth floor the industrial design and women's departments are accommodated as suggested. The departments are well grouped in the main, and the means of intercommunication and lighting excellent. The author uses red brick and terracotta or stone in the elevations, which show five stories, besides basement half sunk. The conditions are generally complied with. All students would pass the porter's office in front, where they would be registered; the author provides an inclined way to bicycle-room on basement in Sackville-street, and the four staircases for students are available for access to the lecture-hall on first floor. An iron roof is shown over this hall, which is lighted both from the side areas and from roof. The front towards Sackville-street is shown by a forcibly-coloured elevation of red bricks and terracotta, or stone dressings, five stories in height, in addition to basement, in a French Renaissance style. A boldly-tinted India-ink perspective shows gabled angle projections and centre.

The second premiated design, by Messrs. Gibson and Russell, has a more carefully devised basement floor, in which the laboratories and workshops are well grouped. The foundry and weaving and testing shops are parallel to Sackville-street at the Granby-row end of block. Applied physics and electrical engineering occupy the Rifle-street front, the advanced laboratory and mechanical laboratory occupying more than half of this front, and in line with the laboratory and testing room of the mechanical department—a desirable arrangement. The Whitworth-street and Sackville-street fronts have the working and administrative rooms, with gymnasium, &c., in the centre, on one side of a court, 88ft. by 62ft. On the ground floor, the main entrance is placed at the end of Whitworth-street block, next Sackville-street front, and the museum is placed alongside, and extends a considerable distance along this front, with staircase at the end. The administration department is continued along Whitworth-street, the frontage of which is made to square with Sackville-street, with caretaker's house in the acute corner of site outside the main building. An internal corridor gives access to the departments, which comprise the administration, mechanical engineering, physical and textile departments, and are partly lighted by two inner courtyards separated by the elementary laboratory and telegraphy rooms, which form the central cross block. On the next floor the examination hall, 88ft. by 45ft., occupies this position, lighted by the courts on each side, and approached by the staircase from the museum facing Sackville-street. The departments are well kept together. The textile occupies the front and right-hand return, the mechanical department extends round Granby-row and Rifle-street corner, and the administrative and women's department round the remainder of block towards Whitworth-street. The commercial subjects occupy the same wing on the second floor, and the building trades the remainder of three fronts, while the third floor has the industrial design on the Whitworth-street front, and applied chemistry and brewing at the rear of Granby-row. Dyeing and printing are assigned the front block, with metallurgy over the centre. There are five stories and basement. The workshops are covered by an iron roof. The Sackville-street front is extremely plain, having circular-headed wide and oblong windows of factory-like character; the upper floors are relieved by bands of terracotta, and there is an ornamental centre gable with cupola over. The fronts towards Whitworth-street and Granby-row are plain, if not ugly. The ground-floor corridors do not appear to be well lighted. The perspective view is by no means flattering, and there is a heaviness of treatment.

The third premiated design, by Mr. Ernest Runtz and Mr. F. R. Farrow, is of 18th-century Classic character. The main Sackville-street front has a centre and corners with level parapets, without visible roofs, against which the main roof stops. Red brick relieved by bands of light material and arched windows, rusticated, are the chief relief. The Whitworth-street front has a gable in centre over the public entrance, and flat-topped angle pavilions, a domical low story building at corner over lavatory, &c. In plan the authors distribute their Whitworth-street block in line with the street, which makes an unfortunate obtuse-angled junction between the end of it and the Sackville-street block. The exhibition hall is placed on the longitudinal axis parallel to the longer frontages, and is 95ft. by 50ft., divided by columns into aisles. From the end of hall a corridor continues to Granby-row, where there is a student's entrance. There are four areas—two on each side of longitudinal hall block, with corridors running the whole length of the Rifle-street and Sackville-street blocks, joining a transverse corridor along the inner side of Whitworth-street block. Dyeing and finishing occupy the Rifle-street, and the building trades the Sackville-street fronts. There appears to be a want of classification and division of departments; thus we find on the first floors the building trade partly in Whitworth-street, with dyeing, shorthand, and dressmaking on the same floor at corner of Sackville-street. Mechanical engineering is located in the same front, and applied physics and chemistry in Granby-row. The lecture and examination hall is 80ft. by 50ft., and in line with the exhibition hall, from which it is approached by a staircase at the end of latter. The corridors are well lighted by the four areas. The position of the applied physics and electrical engineering on the second floor is undesirable, for reasons we have pointed out, and these departments would have been better in the positions assigned to building trades and dyeing on the ground floor. They are made to occupy the Rifle-street and Granby-row blocks, industrial design being placed along the principal fronts. The general grouping of blocks was capable of a better classification of departments.

The fourth premiated set by Mr. Theodore Sington, of Manchester, shows a cleverly-planned and well-worked-out basement floor, in which the author has evinced considerable technical knowledge of the requirements of the main workshops and laboratories. The laboratory for testing is placed in the Whitworth-street block, which runs parallel to the street; the applied physics and electrical department faces Rifle-street. The advanced laboratory, 50ft. by 30ft., is shown with proper stone benches carried down to the solid rock, with room for constant temperature below it, and the dynamo-room and engine-house complete this range. The moulding-shop and foundry are convenient to the laboratory for testing and metallurgical laboratory. The textile trades are arranged in three departments parallel to Granby-row, and occupy the centre portion of area, all top-lighted. The shafting and belting for working the looms, reeling and other machines, are well arranged. A corridor gives access to these rooms. The ground floor shows the main entrance in Whitworth-street leading to a large hall parallel thereto, with inner corridor, giving access to departments. Applied physics occupies the Rifle-street and Granby-row fronts. The plan is thus a large quadrangle, having a series of parallel glazed roofs over the textile workshops. On the first floor, the mechanical engineering department forms the Rifle-street block, and the building trades that towards Sackville-street, the examination hall being in the Whitworth-street block. The second floor

accommodates the commercial, the women's, printing, and brewing departments; the third floor applied chemistry and dyeing. The external elevations are Italian in style, neatly drawn, with corner pavilion roofs, and a centre arched entrance in Whitworth-street. The Sackville-street front has a centre. There are five stories, and the material is mainly of red brick, and dressings of a lighter material. Generally, the workshop and laboratory accommodation is well provided for; the author simplifies his plan by making his main blocks surround a large open quadrangle, the suites of rooms being made accessible by an inner corridor. Ample light is obtained to the two large halls, but the staircase access, lifts, cloak-rooms, and minor details are scarcely so well provided as in the other designs.

The other twenty-two designs include a few which run the favoured four very closely, both in plan and elevations; these are distinguished by letters. Amongst them we may mention "C" as an elaborate, artistically grouped and well-drawn set of designs having a sepia perspective. The design is Renaissance in character, the main front is towards Whitworth-street, the centre block of which is well emphasised by a high-pitched roof, with lofty flèche; the plan is U-shaped. The corridors are wanting in directness and lighting. "M" has also a well-grouped arrangement of blocks; the main façade is pronounced by a centre flanked by turrets with cupola terminations and gabled ends in a like style and of red brick. There are four areas in plan giving light and ventilation. The examination hall and mechanical lecture rooms are placed on the long axis, and corner staircases and lifts are provided. The front towards Whitworth-street is broken to the line of boundary, a plan which a few others have availed themselves of. "N" is also a design of English Renaissance, with mullioned windows and a gabled front towards Sackville-street. There is a centre entrance and corner pavilions with bay windows, and the Whitworth-street front is well broken, and conforms to the boundary. It is accompanied by a well-drawn perspective in sepia. "U" is designed in the same style. A great octagon angle tower and cupola and a high tiled roof are shown. "W" is well balanced with two courts on the plan. "L" is clever, and the detail shows some playfulness of fancy in the relief ornament. "E" is also marked by originality, with angle turrets and a large circular examination hall in Whitworth-street. Other designs show double quadrangle arrangements, but some of these are laboured, and the corridors are indirect and badly lighted. Amongst these we may name the plan marked "K" and several others. The heavy warehouse style is very conspicuous in many of the designs, as in "J" and "Q"—the latter has six stories. The requirement of height and number of floors has been decidedly prejudicial to an architectural treatment; the piled-up stories too often remind one of blocks of industrial "flats," and it was judicious for this reason to exclude Gothic as a style.

THE ALTERATION OF PREMISES.

IN London and all large towns the practice of turning private dwellings into warehouses, hotels, and public buildings has been very usual. These alterations have been made often with the intention of evading the requirements of the Building Acts, which in the Metropolis impose thicker walls and other conditions. Large tradesmen and manufacturers take the leases of several dwelling-houses, and, by the removal of the party-walls, staircases, and other partitions, they succeed in transforming the several premises into one spacious shop. Sometimes the operations have been so far successfully

concealed from the exterior that important structural alterations have been made without due notice having been given. One mode of proceeding is to open one shop after another, keeping up the appearance of distinct shops under one management. In course of time the party-walls are pierced or removed, girders are inserted to carry upper walls, the staircases are removed, and by slow degrees, under the disguise of "repairs," considerable alterations are made, which convert the premises into huge showrooms, and, as far as habitability goes, "death traps." We have occasionally had to record serious accidents arising out of this mode of conversion, disastrous fires sacrificing human lives, caused by improper construction and want of adequate egress. The evil of turning private into business premises has not yet been stopped. Certain sections of the Metropolitan Building Act, as secs. 22, 27, 28, apply to these alterations, but are not explicit nor comprehensive enough. Thus, the term "public building" is meant to apply to any building used as a church, chapel, college, public hall, hospital, theatre, concert-room, hall, lecture, or exhibition room, and to any such it is required (sect. 22) that the floors and lobbies, corridors, landings, and flights of stairs shall be of stone or other fireproof material, and carried by supports of the same kind; and that the walls, roofs, floors, galleries, and staircases shall be constructed in a manner approved by the district surveyor (sect. 30). Both these clauses are vague, while the latter may mean any construction that is approved. But there are no practical rules for transforming dwelling-houses into large shops, or into lodgings for separate families, or into warehouses of certain size, or into uses other than those of public worship or entertainments—that is to say, the only rules have reference to the area or cubical contents, and therefore, if a manufacturer chooses to convert two houses into a dwelling-house for separate families, and contrives to bring the cubic feet below, even by a foot, the statutory 125,000c.ft. of the 22nd sect., he need not make his floors and corridors or stairs of fireproof material; and also if the limit of 216,000c.ft. was not exceeded, dwelling-houses could be turned into a warehouse without having to conform to the rule as to party-walls. In short, by just keeping within these statutory limits, any one can build as he likes. This in fact is done every day.

We are glad to find that the City Council of Liverpool are seeking powers to obtain a new local building act, which will prevent this obvious frustration of the spirit of the Act, under which it is now customary to convert private buildings into warehouses or public buildings. By this proposal the use of any building as a public or warehouse building not used for such a purpose before the passing of the Act shall be deemed to be the erection of a new public building or warehouse, and so be brought within the provisions of the Act or by-laws applicable to such buildings. Also, it is provided that any alteration or addition carried out in any old building, or any new building after the roof has been covered in, shall, to the extent of such alteration or other work, come within the provisions or by-laws in force. The last provision is very necessary. Alterations and additions are constantly being made to premises in a quiet and unobtrusive manner internally, but which may involve great risks. For example, the putting in of a bressummer for a new shop front to an old house may be executed in a manner that would violate the rules laid down in the local by-laws. The supporting piers, or the bearings, or the section of beam may be insufficient; if a girder be put in to carry a party-wall, there is greater difficulty of proving the workmanship, as was lately discovered in a recent fatal fire at Battersea.

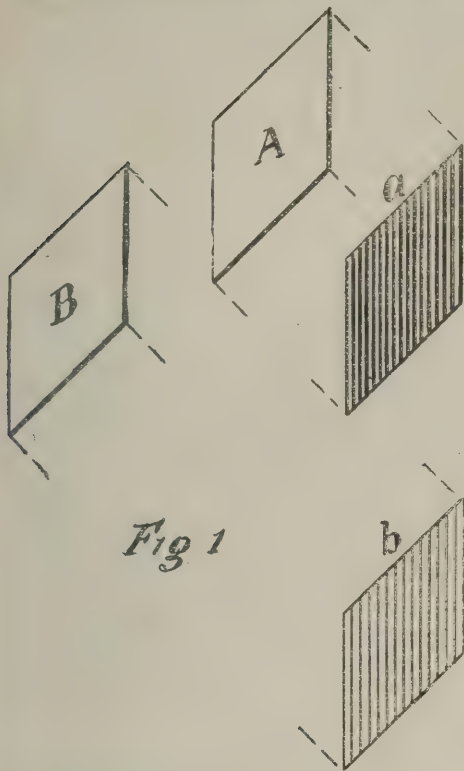


Fig 1

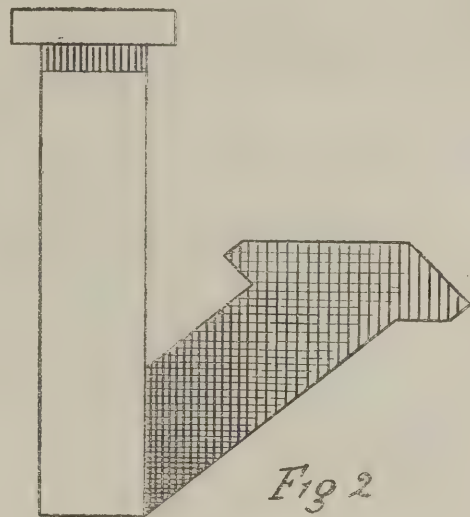


Fig 2

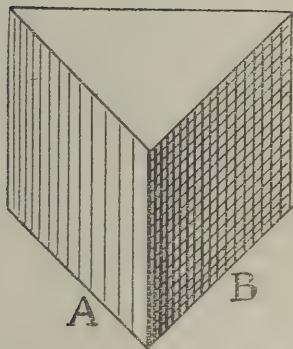


Fig 3

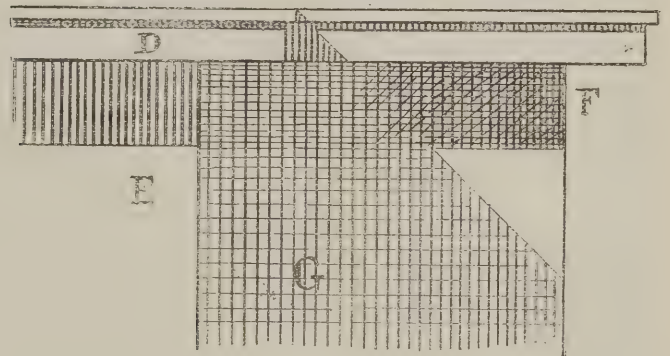


Fig 4.

Again, several brick walls may be removed and wooden partitions be substituted; or a lift or hoist may be constructed without necessary precautions. A hundred things may be done without even the knowledge of the local surveyor, rendering a building not only dangerous in case of fire, but unsafe to the inmates. The London County Council would be setting a good example by introducing clauses in their Consolidation Bill that would control all such alterations and additions.

THE "RENDU" OF ARCHITECTURAL DRAWINGS.—I.

THE study of putting in shadows in drawings has taught us how to determine on the surfaces of bodies exposed to the rays of light, the portions which should be brilliantly lighted and those which remain in actual shadow, and also the position and form of shadows cast against the lighted surfaces by projecting objects or planes. The shadows well indicated in a drawing lend very much to enhance the value of the work; but we must not forget that however well the form of the shadows may be put in, unless the natural effects of colouring, reflected light, and distance are equally well observed, the result will not be what it should be.

The getting-up of architectural drawings, or

the "rendu" as it is called in the Continental art schools, is the art of representing conventionally in colour or neutral tint the various natural effects of brilliancy, tone, and colour in respect to the laws of lighting and distance. We learn the manner in which the rays of direct or reflected light are received by the surfaces of the object, and also the variation of effect with regard to the position of the observer and object, as well as the method of rendering these effects in the drawings by means of colour, Indian ink, or neutral tint.

The rays of light, as in the case of shadows, are supposed to arrive from above at an angle of 45° with the horizontal and vertical planes. The visual rays come direct to the eye of the observer, and all these rays are parallel to each other. Now, besides the direct rays of light at 45° we have the indirect or reflected rays, and these play an important part in the getting-up of a drawing.

If we could imagine an object perfectly isolated in space and receiving the rays of the sun, the portions of the object not influenced by the rays of light would be imperfectly black shadow. But if we place near this object another body, also brilliantly lighted, the lighted particles of the second body would send back the rays, and these, striking the parts of the other body in shadow, would tend to light up to a certain degree these shadows, making them appear less black.

The sources of indirect rays are many, but in

conventional drawings two only are considered necessary to produce the light and shade effects. These two are, the terrestrial rays or light sent back from the surface of the ground, and the atmospherical rays, light reflected from the atmosphere surrounding the object.

Atmospherical rays is the reflection of the direct rays of light by the innumerable particles contained in the air. Each particle floating in the atmosphere acts as a reflector to the direct rays of light, therefore all the particles mutually sending back from one to another these rays in combination produce the indirect diffused light. We, therefore, understand that the shadows of an object such as a building, resting on the ground and surrounded by other objects, are never absolutely black, but always more or less lighted by the indirect rays from the surface of the ground, combined with the indirect rays from the atmosphere.

There are two kinds of indirect rays—those reflected from polished surfaces, and those sent back from unpolished surfaces. A surface in an unpolished state, such as a sheet of unglazed paper, a piece of chalk, &c., appears to be lighted in the same degree of brilliancy all over its surface—no portion will appear to be brighter than the rest. And any change in the position of the object or the observer will not influence to any degree the apparent lighting of the surface. A sheet of iron heated to a red glow is a good example of an unpolished surface. The

light sent back from an unpolished surface is, therefore, diffused—that is to say, the rays are equal to each other in intensity, and do not combine with each other.

If we take an example of a polished body, such as a sheet of polished tin, we shall notice that different portions of the surface appear more or less brilliantly lighted, and each movement of the surface or the observer brings about changes in the apparent lighting. The rays sent back from a polished surface are direct or in a combined state.

We may suppose the surface of the earth to be that of an unpolished body; the light reflected from this surface is, therefore, in a diffused state. An object or building reposing on the ground receives to a greater or less degree the indirect diffused rays from its surface. Therefore, the shadows of the building will be affected by the reflected rays from the surface of the ground.

The general shadows in a building should also for the same reason become lighter in proportion as they approach the ground or reflecting surface, and come under the influence of the indirect rays. Mouldings in shadow turned towards the ground should, for the same reason, be lighter than those turned towards the sky.

We have said that the particles floating in the atmosphere materially reflect the rays of light, and, sending back indirect rays, tend to lighten the shadows of an object. The more we cover these particles and prevent their reflection arriving to the shadow, the darker will this shadow be. Thus the shadow cast by an object against a lighted surface will become darker in proportion to the distance of the object from the surface—that is to say, the nearer the object the darker the shadow, its nearness preventing the action of a certain proportion of the indirect rays. The shadow of A, Fig. 1, will be darker than that of B. The shadow of a chimney against a roof will be darker as it approaches the base of the chimney, Fig. 2. As the distance between the observer and the object increases, so in proportion does the apparent intensity of colour and shadow diminish.

When an object is at a certain distance from us, the rays of light sent back from the object lose their intensity during their voyage through the reflecting particles of the intervening atmosphere. Again, the air between the observer and the object is always more or less charged with impurities and moisture, the effect being to lessen to a great degree the intensity of the reflected rays. In a pure and dry atmosphere, as in Egypt, the colours appear brilliant even at a great distance.

We will take three planes of distance. For the first plane, that nearest the observer, we may consider the effect of distance as nil, and that the colours and shadows retain their utmost degree of intensity. In the second plane, however, the colours begin to combine with the bluish tint of the atmosphere: yellow will appear less yellow and more bluish-yellow; red, less red and more bluish-red; and blue itself less blue if originally dark blue, or more blue if originally light blue. In the third plane these effects are more accentuated. In the far distance the bluish effect greatly increases, and all the colours melt more or less into blue: yellow takes a greenish tint; red, nearly violet; and blue, light blue if originally dark blue, or dark blue if originally light blue. But this blue should never surpass or contain more colour than the blue of the sky, which is the blue of the atmosphere at its greatest intensity.

We will shortly endeavour to render in neutral tint these various effects of distance.

We have also to take into account the effects of contrast and irradiation. We know that if two surfaces, one coloured black and one white, are placed together, the white appears whiter and the black blacker by the effect of contrast; and in two surfaces of an equal size, the white appears larger than the black; in fact, the light colours seem to encroach on the dark colours. This may be noticed when looking at a window strongly lighted from behind—the dark window-bars appear narrower than they really are. A grey surface against white appears still more grey, and black against grey makes the grey appear almost white. Again, colours appear more intense when placed near their complementary colours. Two tints of green slightly different will mutually diminish the effect of one another; but the same green against red appears all the more intense. The same effect will be

noticed with all colours and their complementary colours. If we placed any bright colour against white, the white will gradually appear to be tinted with the complementary colour.

All these effects should be introduced when necessary in an architectural drawing, and should be even exaggerated—the drawing will then appear effective. Of course, the student must combine method with taste, and a close study of natural effects. The windows of a building appear very dark, for the interior of a building is naturally less lighted than the exterior. The dark of the window should also contrast with the well-lighted wall-surface. The roofs of a building appear dark, so as to be well detached from the brilliantly-lighted sky. The shadows in a roof should appear very dark. The general tint of a building should gradually become more intense as it approaches the top; and the portions against the sky should appear tinted with orange, the complimentary colour of the blue of the sky. Therefore buildings of yellow stone or red brick should be graduated in colour, the tint being more intense near the top, and slightly coloured with orange or yellow against the sky.

Fig. 3 is an example of the effect of contrast, the surface B in shadow becoming gradually darker in tone as it approaches the lighted surface A. In Fig. 4, the upper portion in shadow F should appear darker than the rest of the shadow, it being in contrast with the sky. The fine shadows of small mouldings, as at D, should appear very dark, and much darker than the large surface of shadow at G.

A SANITARY CRUSADE THROUGH THE EAST AND AUSTRALASIA.—III.

(Continued from page 347.)

MR. BOYLE was very cordially received by the Melbourne architects, many of whom he had met before when he first visited Australia seventeen years ago.

Melbourne may justly be considered the most remarkable city in the world, the site it occupies being little more than fifty years ago nothing but dense bush, the only sounds heard being the shrill call of the aboriginal and the howl of the dingo. Now there exists a handsome city having a population of nearly half a million, with magnificent public and business buildings which would compare favourably with those of any capital in Europe.

The streets, especially Collins-street and Bourke-street, are wide, well paved, and kept scrupulously clean, whilst the system of cable cars in use is the most complete in the world.

The Houses of Parliament, which are of Classic design and commanding situated at the head of Bourke-street, constitute the most striking architectural feature of the city. Three air-pump ventilators 9ft. in diameter, the largest ever made, were applied to this building about seventeen years ago, and proved very successful, as testified to by the report of the Minister of Public Works and Railways, the Honourable John Woods, M.P. Within the last few years two other systems have been applied for the purpose of mechanically forcing air into the buildings.

The first was introduced by Mr. Lloyd Tayler, F.R.I.B.A., a leading architect in Melbourne; but before the work could be completed and properly tested a change in the Ministry occurred, when it was decided to adopt another plan which, though an improvement on the old method of admitting air, which consisted of plain open tubes, has not proved entirely successful, there being strong complaints of down-draught.

Mr. Boyle was desired by the Honourable Gavan Duffy, M.P., chairman of the Ventilation Commission, to make an examination of the present ventilating arrangements of the House, and furnish a report thereon and a plan for the improvement of the ventilation embracing the latest improved form of the self-acting air pump ventilator, which has been done. The present ventilators in the roof, intended for the exit of the air, and which consist of the old louvre pattern and plain open pipes with covers on their tops to prevent the ingress of rain, when tested by Mr. Boyle and the engineer, were found to be admitting a strong down-draught of cold air effectually preventing the egress of the vitiated air. This down-draught was also experienced on the floor of the House when the plenum system was in full operation. The arrangements for washing, cooling, and warming the air-supply were also found to be defective.

Mr. Lloyd Tayler, who is a scientific expert in ventilation and an accepted authority on the subject, has adopted the air-pump ventilator for the new Commercial Bank now in course of erection in Collins-street, and which, when finished, will rank with the finest buildings of its kind in the City. Mr. Tayler writes Mr. Boyle: "It will give me great pleasure to avail myself of your well-known patent ventilators in the various buildings with the erection of which I may from time to time be intrusted." During Mr. Boyle's stay in Melbourne he received very valuable assistance from Mr. George C. Inskip, F.R.I.B.A., the President of the Royal Victorian Institute of Architects, who says:—"I am pleased that you propose establishing a manufactory of your patent ventilators in this colony. I shall be glad to specify your ventilators, and will do so." Mr. Boyle, in conjunction with Mr. A. Purchase, F.R.I.B.A., surveyed the new Stock Exchange, a very handsome building situated in Collins-street, and prepared plans for the ventilation, which will be made on a very elaborate scale. An examination was also made of the Bank of Victoria and other buildings, and plans for the ventilation submitted. Messrs. Oakden, Addison, and Kemp, architects, state:—"We believe your patent ventilators will meet all requirements, and shall be glad to specify them." Messrs. Crouch and Wilson also report:—"The system of ventilation formulated by you has always commended itself to us as the only means to secure absolute automatic and efficient ventilation." This is endorsed by Messrs. Craven, Brown, and Marquand, who say:—"We have had frequent opportunity of proving the value of your inventions."

A system of sewerage has now been adopted for Melbourne, and is in course of construction, the initial cost of which will be about three millions sterling. Mr. Thwaites, the engineer-in-chief to the Melbourne Metropolitan Board, conferred with Mr. Boyle on the question of the ventilation, and instructed him to prepare and submit a complete scheme of ventilation for the sewers and drains on the Boyle system, which has been done. It is also proposed to adopt the air-pump ventilators for the ventilation of the soil-pipes. Messrs. John Danks and Son, Limited, Melbourne, have been appointed agents for Victoria.

At Adelaide the Houses of Parliament, Government House, Government Buildings, Supreme Courts, Post-Office, Museum, Art Gallery, University, the Hospital, and a large number of other public buildings are ventilated with the air-pump ventilators.

After visiting Tasmania, the "Garden of Australasia," Mr. Boyle proceeded to New Zealand, arriving in Dunedin, the chief town in the province of Otago, having a population of 46,000. There are a number of handsome public buildings in this city, where Mr. Boyle found his ventilating appliances in general use. Messrs. Mason and Wales, architects to the hospitals, report: "Your ventilating cowls have been used on several buildings designed by us with good effect."

Christchurch, or, as it is called, "The City of the Plains," situated on the banks of the Avon, is eminently English in its appearance, architecture, and surroundings, and has a population of 45,000. The house-drainage of this town is, in accordance with the drainage regulations, ventilated exclusively with the air-pump ventilator, and it is estimated that there are over 5,000 used for this purpose in Christchurch alone.

Mr. Edwin Cuthbert, C.E., engineer to the drainage board, the highest sanitary authority in New Zealand, reports: "It gives me much pleasure to state that I have used your air-pump ventilators in connection with the house-drains of this city and district for the last ten years, and I have always found them to act most satisfactorily."

Most of the public buildings in Christchurch are also ventilated with the Boyle system. Mr. J. C. Maddison, F.R.I.B.A., states: "I have for years specified Boyle's ventilators, and shall insist upon them always being used, as I consider them the best"; whilst Mr. F. Strouts writes: "I always specify the air-pump ventilators, and they have always acted most satisfactorily."

Messrs. Taylor and Oakley, Christchurch, have been appointed agents for the South Island of New Zealand. Wellington, the premier city of New Zealand, the seat of Government and the Vice-Regal Court, is beautifully



HOUSES OF PARLIAMENT, MELBOURNE.

situated at the south end of the North Island, and has a population of about 34,000. It possesses many handsome public buildings, including the Houses of Parliament, Government House, Government Buildings (said to be the largest wooden structure in the world), Post Office, Supreme Courts, Hospital, Opera House, &c., to all of which the air-pump ventilators are applied. Mr. W. Hales, the Government Engineer-in-Chief, reports: "The ventilating

board, who writes: "I have known for many years the form of construction of your excellent ventilating appliances, and it gives me much pleasure to learn that you have established in the Colonies a method by which we can obtain ventilators of your latest pattern." A very handsome building of Early English design, intended as an insurance office, is at present in course of erection near to the post office, the ventilation of which will be effected by six large air-pump

Thomas Ballinger has been appointed agent for the provinces of Wellington, Taranaki, and Napier. Auckland, the mother town and first capital of New Zealand, is a very fine city, having a population of 52,000. It possesses a number of handsome public buildings, many of which are ventilated with the Boyle system. Mr. Chas. R. Vickerman, C.E., President Government Engineer, writes: "I am very pleased to learn that you intend to give us the benefit of your ex-



MUNICIPAL BUILDINGS AND CENTENNIAL HALL, SYDNEY.—(See p. 347.)

appliances manufactured by your firm have been used in many of the Government buildings in this colony, and have given perfect satisfaction." The air-pump ventilators are also employed for the ventilation of the soil-pipes, several thousands of them being in use.

It is proposed to rearrange the drainage system of Wellington, and Mr. Boyle has submitted a scheme for the ventilation on the Boyle system to Mr. William Ferguson, chairman of the drainage board, and engineer to the harbour

ventilators of an ornamental character. The architects, Messrs. Clere and Richmond, report: "We have occasion very frequently to use your ventilators, which fulfil all the requirements of a good exhaust ventilator."

Messrs. Thomas Turnbull (F.R.I.B.A.) and Son, who were among the first to adopt the Boyle system in New Zealand, state: "We have great pleasure in testifying to the excellence of your Air-Pump Ventilators, which we have always found to act most satisfactorily." Mr.

cellent ventilators in this city. I shall take every opportunity of availing myself of your deservedly-popular ventilators."

In the Colonies, as in this country, architects have occasionally inferior imitations of the air-pump ventilator, &c., supplied by unscrupulous contractors in place of the genuine articles which were specified to be used, and respecting which disreputable practices Messrs. Boyle have received a large number of letters from architects and others.

to the width, being equal to a whole circle from the stage, and that the straight lines narrowing towards the scene have a disagreeable aspect, and some of the disadvantages which would attend the sides if they were square. In

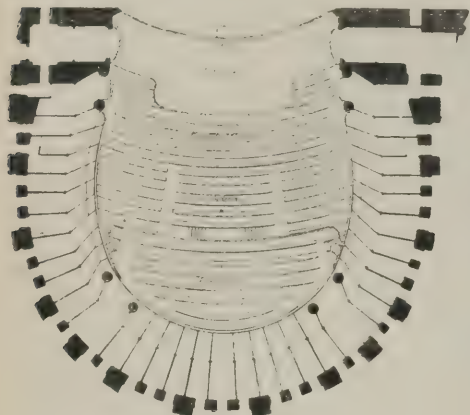


FIG. 2.

comparing these disadvantages, it is necessary to observe that our attention is constantly engaged by the actor; that we maybe content with looking once or twice at a scene, but our face is always towards the actor, therefore those side seats which approach the stage look in a direct line; but as they recede from the stage, the angle becomes proportionably acute, and occasions a very painful position of the head.

The circle is not a suitable form for a theatre except on the private-box system, as the seats

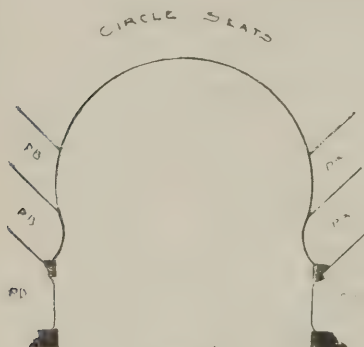


FIG. 3.

converge to the centre of the auditorium instead of to the centre of the stage. Fig. 3 shows an arrangement of a horse-shoe form for a small theatre, with the sides planned for private boxes. The seats should not be sighted to only one point on the stage, for this reason, as already fully described in a former chapter. The dress-circle

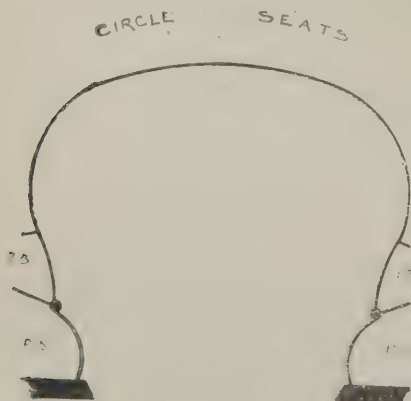


FIG. 4.

seats should be arranged on a slight curve facing the stage, and the sides (Fig. 4), as is almost universally the case, given up for private boxes for those who care to be seen, more than to see.

There are, however, cases in smaller theatres where private boxes are deemed necessary for the legitimate use of witnessing the performance; these are then placed, as at the Gaiety and Princess's, behind the rows of the dress-circle seats.

Where a theatre has two or more tiers rising one above the other, the arrangement of the various circle fronts on the same line or curve is monotonous, besides being prejudicial to seeing, hearing, ventilation, and the comfort of the audience. The arrangement of lines may be somewhat on the system of the accompanying diagram, or any other variety of curve that the architect may desire (Fig. 5). Where the various lines meet at the commencement of the side private boxes, it may be generally accepted that the horseshoe form, with its modifications, is appropriate for the large opera houses, but a semi-elliptical curve is best for the small theatre.

Mr. Ralph Neville, who is a strong advocate for the Haymarket plan, calls attention to the fact that there is a large class of intelligent playgoers, who now rarely attend theatres, as they cannot afford, or grudge, more than a half-crown, and are not prepared to face the discomfort of the ordinary pit. It is this class who are benefited by the first circle, which has taken the place, in point of price, of the defunct pit at the Haymarket. This circle, as is well known, is at a level slightly higher than the dress circle at most theatres, and is a most excellent position from which to view the performance. With regard to the ceilings over the circles or over hanging galleries, Mr. Neville advises that they should, where possible, be slightly curved—it is seldom, however, the cantilevers will permit this—and that they should be always coloured blue, which is the colour giving the effect of distance.

It will be within the recollection of some of my readers that a few years back there was published in the *Daily Telegraph* the plan and section of a scheme for the construction of what was termed a "safe theatre," which, it stated, "Mr. Henry Irving has conceived, and Mr. Alfred Darbyshire, architect, of Manchester, has developed." The diagrams (Fig. 6) and the published description of this scheme almost demand their

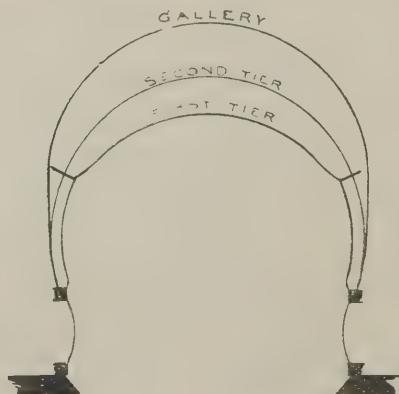


FIG. 5.

reproduction in this series of articles, as they have been recently referred to by Mr. Townsend, in his paper on "American Theatres," read before the Royal Institute of British Architects during the past session. For this reason I give the following extract:—"As the building would be only one story high, the question at once presents itself—how is it intended to dispose of the various sections of the audience? The answer involves a complete revolution in the internal arrangement of our theatres. The lofty gallery will disappear, to find a more comfortable, more convenient, and more healthful location upon the ground floor immediately behind the pit, while in front of the latter, as at present, there will be the stalls. Although the "gallery" will thus be placed at a distance from the stage, its frequenters will have a thoroughly good view of the scene, and will be able to see the faces and expressions of all the artists, instead of gazing down on the top of their heads. This is secured by keeping the dress circle overhead sufficiently high and sufficiently far back to allow the persons in the most distant seat of the gallery to be in the line of sight with the stage, so that they will command from one to two-

thirds of the area of the proscenium. The single story of the theatre is devoted to the dress and upper circles, which are reached by straight staircases, communicating directly with the street, and attaining no more at their utmost height than 24ft. from the ground. The facility of access and egress thus provided seems all that could be desired, both in point of extent and directness. There are four public exits from this part of the house opening upon the street by means of straight distinct staircases, without landings or curved steps of any kind. There are no openings to any staircases, except the direct one from the auditorium. If the safety of the patrons of the theatre has been consulted at every point, it has been done without sacrifice to their pleasure. Indeed, in the proposed building their command of the stage would be greater than at present; the seats are all arranged in the segments of a circle, and are divided longitudinally and transversely by gangways 3ft. wide. From the above plan, it will be seen that the upper circle and dress circle have each an entrance and an exit staircase on opposite sides of the building. Corresponding provision is made for the reception and departure of the audience on the ground floor by means of an entrance and an exit on each side of the house. At the close of the performance every night all the entrance doors will be converted into exits, so that practically the outlets would on all occasions be doubled, as on all occasions they are to be used—the latter an important consideration, since in case of panic there would be no unfamiliarity with the provisions designed for speedy and safe escape, and no crush by conflicting crowds meeting on a common staircase or entrance hall. A house of this simple form would allow of a more perfect system of ventilation than is now practicable. Nor would the multiplicity of passages tend to the discomfort of the audience by creating draughts, as all the doors would be made to close automatically, thus arresting any currents that might be created, while at the same time the provisions for liberating the spectators would remain unimpaired, all the doors being made to open outwardly upon the application of the slightest pressure."

I will not comment upon the internal arrangement of the audience in this "safe theatre," further than to say that at a distance of 90ft. 8in., which is the depth of the auditorium, the unfortunate occupants of the back row of the gallery would have little chance to see the facial expression of the actor or hear the words he uttered. I leave for the present any observations on planning of the exits and staircases in this scheme, as I shall have to deal with this in a future chapter.

CHIPS.

The new pavilion in connection with the bowling green at Whitefield, near Rochdale, was opened on Saturday. The pavilion consists of a billiard-room 32ft. by 21ft., reading-room, committee-room, bar, lavatory, and other suitable accommodation. The architect is Mr. Thomas Thorp, of Whitefield.

Memorial stones of a new Wesleyan chapel at Fillongley were laid by Lord Leigh on Wednesday week. It is Gothic in style, and is to be built of brick with stone facings; it will seat 150 persons, and adjoining is a schoolroom accommodating 75 children. Mr. Ewan Harper, of Birmingham, is the architect, and Mr. W. Hopkins of the same city is the builder. The outlay will be £900.

Mr. J. Buchan, A.M.I.C.E., at present borough surveyor of Grimsby, has been elected city surveyor by the Norwich corporation.

The highway bridge at Charlton, Dover, has just been rebuilt and widened for the corporation of that town. Mr. W. Bromley was the contractor.

The South Shields School Board have appointed Mr. William Landler assessor in a competition for a new school, and have instructed him to advise them as to the conditions of competition.

In the bankruptcy case of Alfred James Ingram, of Maud-grove, King's-road, Chelsea, and late of Ellison-road, Streatham, late builder, and now of no occupation, the discharge has been suspended for two years, ending August 8, 1894.

At the Saffron Walden petty sessions last week, a man giving the name of Joseph Gregory was committed for trial on a charge of forging the name of Mr. Joseph Bell, J.P., builder and contractor, to a cheque for £12 10s. Prisoner is alleged to have asked Mr. Bell, as a magistrate, to attest a signature to some papers, and then to have copied the name as an endorsement to a cheque.

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MIDLAND FLOORING Co., St. Mark's-road, Wolverhampton.
WOOD BLOCK FLOORING Co., 11, Queen Victoria-street, E.C.

WOOD CHIMNEY PIECES—

FOSTER and COOPER, 63, Long-row, Nottingham.

WOOD-WORKING MACHINERY—

BUTLER, SYDNEY, Park Works, Langley-lane, Vauxhall, S.W.
REYNOLDS, F. W., and Co., Acorn Works, Edward-street,
Blackfriars-road, S.E.

WROUGHT-IRON GATES, GRILLES, &c.—

TEALE and SOMERS, Leeds.
WORRELL (Specialist), Byrom-street, Liverpool.

ZINC WORKERS—

THOMERSON, CHAS., 263 and 265, Hackney-road, N.E.

THE INTERNATIONAL HORTICULTURAL EXHIBITION, EARL'S COURT, LONDON, S.W.

A GRAND INTERNATIONAL POTATO EXHIBITION

Will be held by the Executive of the International Horticultural Exhibition, in connection with the
SHOW OF HARDY FRUIT, at Earl's Court, London, S.W., on October 5, 6, and 7, 1892.
When PRIZES to the amount of £100 will be offered, also a GOLD MEDAL for the most meritorious
Collection of Potatoes, and a SILVER MEDAL for the best dish of Potatoes in the Exhibition.

Applications for Schedules and full particulars should be made to THE SECRETARY, International Horticultural
Exhibition, Earl's Court, London, S.W., or to P. MCKINLAY, 24, Upper Thames Street, London, E.C.

CONTENTS.

The Manchester Technical School Competition ...	377
The Alteration of Premises ...	378
The "Rendu" of Architectural Drawings.—I....	379
A Sanitary Crusade through the East and Australasia.—III.	380
Formation of a Master Slaters' Association....	382
Theatres.—VII.	382
The Building News Directory ...	XIII.
Our Illustrations ...	385
Competitions ...	385
Architectural and Archeological Societies ...	385
Wayside Notes ...	404
Obituary ...	404
Prices.—XLVI.	405
Sanitary Congress at Portsmouth ...	405
National Plumbers' Congress at Dundee ...	406
Bricks and Joints in Brickwork ...	406
Engineering Notes....	407
Correspondence ...	407
Intercommunication ...	408
Legal ...	408
Legal Intelligence ...	409
Water Supply and Sanitary Matters ...	409
Our Office Table ...	409
Trade News ...	410
Tenders ...	411

ILLUSTRATIONS.

PATIO DE LA CASA DE OLEZA, PALMA, MALLORCA.—A MINSTREL OF MALLORCA.—HOUSE AT BIRKDALE.—NEW WORKHOUSE, HASTINGS.—NEW WING, OSBORNE HOUSE, ISLE OF WIGHT.—NEW PULPIT AND CHOIR STALLS, ST. MICHAEL'S, BEDFORD PARK.—FURNITURE FOR THE NEW COUNCIL CHAMBER, YORK.

Our Illustrations.

SKETCHES IN MALLORCA, BY W. F. YEAMES, R.A.

ONE of the special charms of the picturesque town of Palma are the numerous courtyards, not two of which are alike. The earliest are Gothic in character; then many in Renaissance style; others a strange mixture of the two preceding manners; and the more recent ones, though attractive, with no distinguishing architectural features. Every house of any kind of pretension has a courtyard, which you enter from the narrow street by a large gateway. One, two, three, or all four sides of the yard are arcaded, and invariably a stone staircase leads to the upper floor, no second floor existing above it. The columns supporting the arches, often of Brescia marble quarried in the island, are squat and bulgy in shape, with capitals generally too large. The arches have a wide and flatish span, giving to the newcomer the impression of weakness, specially as in the view given of the yard of the Casa de Oleza; the arch supports two columns, which in their turn support the flat roof that shelters the staircase. Nowhere in these Majorcan courtyards do you come across pure style or fine proportion; still, the effect produced is pleasant, from its having a character of its own, and eminently pictorial in aspect, several suggesting scenes such as Paul Veronese delighted in. In most of these yards are wells, with elaborate ironwork. The well serves to draw water from a tank underneath the yard, and supplied with water by an aqueduct still in use, and built by the Moors, which aqueduct brings beautifully clear water from a spring in the mountains nine miles off. The different doors in the yards lead to the stables, cellars, and store-rooms, and in many shrubs and flowers are placed in pots about the yard, on the steps of the staircase, and along the open passage above the arch, where, in the Casa de Oleza, tressi-work is painted. Our illustrations are reproduced from the charming paintings by Mr. W. F. Yeames, R.A., shown in this year's Royal Academy exhibition.

HOUSE AT BIRKDALE.

This house is built of 2½ in. Ruabon bricks with red sandstone dressings, the roofs are covered with brown tiles, and the tile-hanging is of red tiles; the gables are modelled in fibrous plaster. The interior finishings and doors are of oak, mahogany, rosewood, and ash, and the floors are laid in the same woods. The ceilings are richly panelled, and the finishings generally are of the best of their kind throughout. Messrs. Duxfield Bros., of Southport, are the builders, and Mr. Frank W. Mee, of 100, King-street, Manchester, is the architect.

HASTINGS NEW WORKHOUSE.

MR. P. H. TREE, F.R.I.B.A., architect, of St. Leonard's, was selected in the competition held some little time ago for this work, and we illustrate the workhouse to-day as developed in the working drawings subsequently prepared. The slope of the site giving a considerable fall necessitates a series of terraces; but the divergence in levels has been cleverly managed. To the rear of the official block, near the entrance gateway, are located the workshops, and between the main group of buildings and the infirmary is placed the workhouse chapel. In the distance is seen the water-tower, and behind the infirmary comes the isolated block.

NEW WING, OSBORNE HOUSE.

We fully described this important new addition to the Queen's marine residence at Osborne, on page 266, in our issue of August 19. The work has been completed from the designs and under the superintendence of Mr. J. R. Mann, A.M.I.C.E., surveyor of works to the Osborne Estate, by Messrs. W. Cubitt and Co. The interior ornamentation of the Indian or Durbar room is being done by Messrs. Geo. Jackson and Son, of 49, Rathbone-place, W., and is exceedingly elaborate, and was designed by Bhairam Singh, of Lahore, and we hope soon to illustrate his work.

NEW PULPIT, ST. MICHAEL'S, CHISWICK.

THIS church is now closed, and will be reopened on Michaelmas Day. The completion of the fabric is in hand, the north aisle being erected and opened into the nave. A new ceiling is in course of erection in the south aisle, and the church is being repainted throughout. The roof and walls between the timbers, which are greenish blue, will be finished a warm yellow cream, and the remainder of the plastered walls are coloured a decided red. The panelled dado round the building is being completed, including a screen, lobby to the north door, and pediments to the vestry and east entrances. Messrs. Adamson and Sons, of Turnham Green, are the builders. The oak pulpit to be erected on the south side of the roof screen illustrated to-day will take the place of the temporary rostrum. The stalls in the choir will not be erected at present, waiting for funds. The sketch explains itself. The pulpit-base is of stone. Messrs. Farmer and Brindley are the contractors for these fittings. Mr. Maurice B. Adams, F.R.I.B.A., is the architect.

FITTINGS IN NEW COUNCIL CHAMBER, YORK.

WE give two more pages of illustrations of the interior fittings of the new Council chamber at York. As stated last week, when we gave the first two pages, the fittings are carried out in white oak, wax polished, and with gun-metal fittings. The work has been executed by Messrs. Oldham and Knight, of Nottingham, from the design of Mr. Gilbert S. Doughty, architect, of the same city.

GRAND HOTEL, CLACTON-ON-SEA.

The illustration published by us last week showed a perspective view of the south angle of the proposed Grand Hotel, Clacton-on-Sea. The reproduction was from the competition set of drawings sent in by Messrs. Roger Smith, Son, and Gale, to whom the first premium was awarded. The work will be carried out by Mr. Arthur F. Gale, F.R.I.B.A., of 4, Serjeants' Inn, Fleet-street, E.C. The site is surrounded on all sides by roads, and when completed the hotel will cover the whole area. The principal front is to the Marine Parade, and will be 160ft. from the edge of the cliff. At present it is proposed to provide bedroom accommodation for 60 guests. Part of the larger scheme provides a hall, arranged so that it can be used for entertainments, either in connection with the hotel or be let apart from it. The structure will be of red brick and stone, and the floors are proposed to be fireproof throughout. The completed block will form three sides of a quadrangle, the centre of which will be laid out as a flower-garden and tennis-court. The estimated cost of the first portion to be built, which alone was illustrated, is about £12,000, exclusive of the cost of site.

An altar-piece of seven panels, containing subjects in the life of Christ, painted by the late Gambier Parry, of Higham Court, has been placed in the Chapter-house of Gloucester Cathedral.

COMPETITIONS.

ACCRINGTON.—In an open competition for new technical schools at Accrington, the designs of Messrs. Morley and Woodhouse, architects, of Bradford, have been awarded the first premium.

WALSALL NEW TOWN HALL.—The corporation have decided to appoint a professional assessor to adjudicate upon these plans when received, but the selection of assessor is not yet made. He will undoubtedly be a gentleman of standing in the profession—so the town clerk says.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION AND THE MUNICIPAL SCHOOL OF ART.—The council of this association have recently issued circulars to the members, intimating that they have completed arrangements with the School of Art by which the educational work of the association will be brought into connection with the school in such a manner as will give greater facilities for the study of architecture. The School of Art and the Architectural Association have combined to undertake a special course of architectural classes and lectures for the purpose of giving a student in four years all that he needs in the early years of his career, the historical subjects being dealt with at the School of Art, and the technical subjects at the association meetings. Special lectures have been arranged for in addition to the classes already held at the School of Art, and the association meetings have been rearranged and strengthened as far as possible. The classes commenced on Monday last. The association, in addition to paying a part of the fees of those of its members who join the School of Art course, affords them the advantages of its own meetings, and offers special prizes both for sessional work and for sketching, &c., during the summer. The lecturers at the School of Art upon strictly architectural subjects are Messrs. W. H. Bidlake, Freeman Smith, and Charles Morgan. At the special meetings in connection with the Architectural Association the subject of construction will be dealt with at gatherings held at Mr. H. R. Lloyd's office, Colmore-row; while a class of design will meet at Mr. W. Hale's, also in Colmore-row.

CHIPS.

Among the resolutions passed by the Trades Union Congress at its final meeting at Glasgow, on Saturday, was one instructing the Parliamentary Committee to take the necessary steps for having passed into law a Bill providing for the compulsory adoption of the Artisans' Dwellings Act by all local authorities.

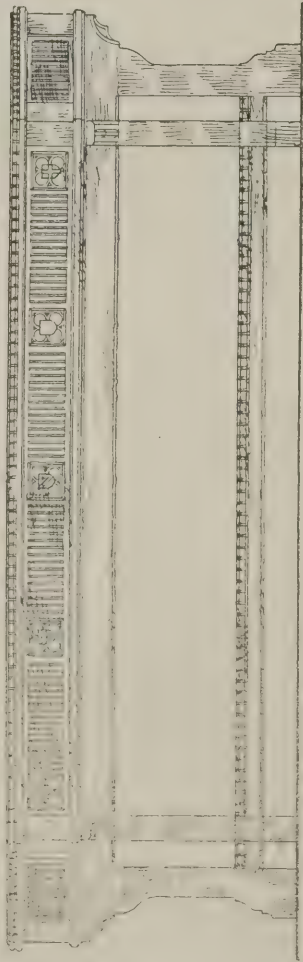
The local board for Wardle, near Rochdale, have appointed Mr. Tertius Wood as engineer of the sewerage works in succession to Mr. R. Vawser, of Salford, deceased. The terms agreed upon were 2½ per cent. for preparing the plans, and 4 per cent. for superintending the work and getting out quantities.

On Saturday a commodious hall and club, erected by the members of the Leeds District of the King-ston Unity of Oddfellows, was opened by Col. North. The building is situated in Union-street, Leeds, immediately facing the open square known as the "Midden." It is in the Renaissance style. In the basement is a kitchen, in addition to cellars, A billiard-room, containing two tables, and a reading-room, measuring about 26ft. by 18ft., occupy the ground floor. On the first floor is the hall, measuring 53ft. by 25ft., and fitted with a platform, dressing-rooms, &c. The caretaker's premises are located on the second floor, and in addition there are three lodge-rooms, about 21ft. by 14ft. The work has been carried out by Mr. D. Foster, contractor, of Leeds, under the supervision of the society's architect, Mr. J. M. Porter. The cost, including fittings, is £3,500.

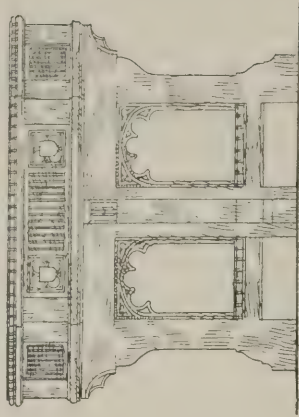
The Stockport Town Council have appointed a committee to inquire into the probable cost of erecting a Town Hall for the borough.

Plans have been prepared by Mr. Hubert Bensted, of Maidstone, for the erection of a school of art in part of the museum grounds in that town. The design provides for a new west wing on the site of the curator's garden.

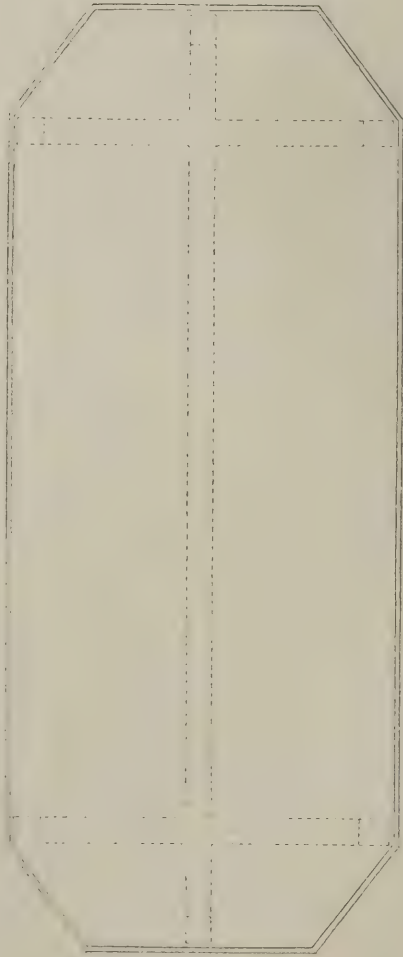
The alterations and repairs of Linlithgow Palace, carried out by Mr. R. Philip, under the direction of Mr. W. W. Robertson, of H.M. Office of Works, are now completed. According to the terms of the Government grant, further repairs will be made next season, when a fountain also will be erected in the grounds.



Side View of Centre Table

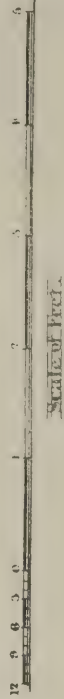


End View of Centre Table

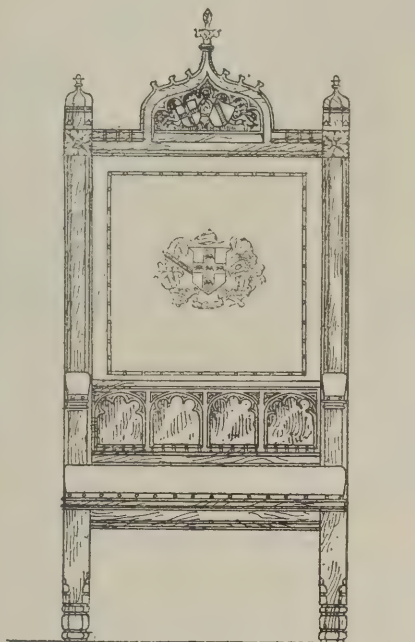


Plan of Top of Centre Table

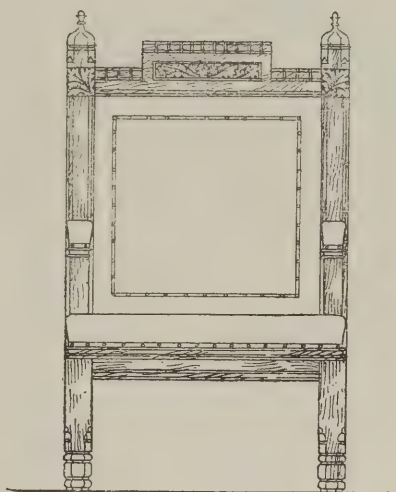
City of York:
Fittings for the New Council Chamber:



Gibson & Son, Architects,
14, Ratchford Gate, Nottingham.



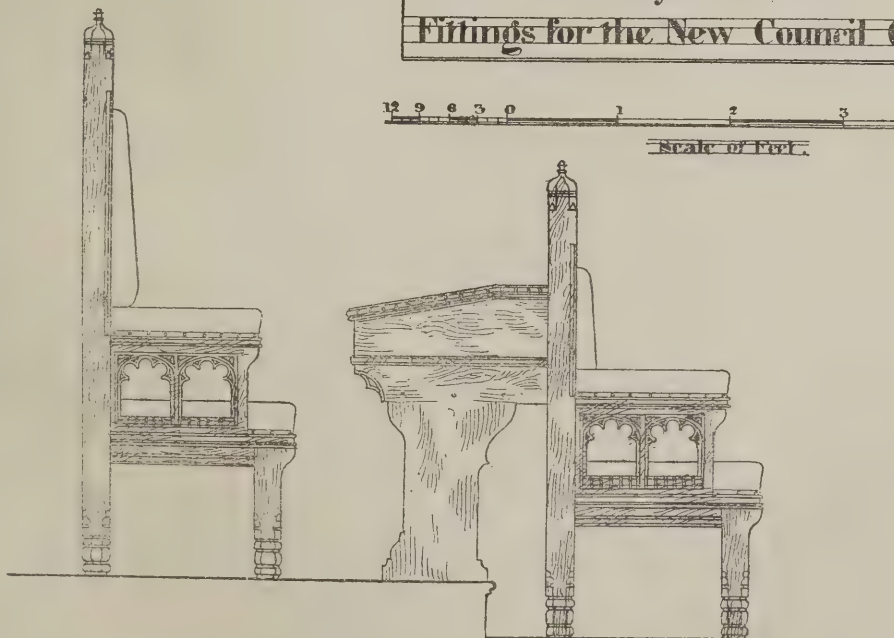
Front View of
the Lord Mayor's Chair.



Front View of
the Town Clerk's Chair.

City of York:
Fittings for the New Council Chamber:

12 9 6 3 0 1 2 3 4 5
Scale of Feet.



Side View of the Lord Mayor's Chair and Desk and
the Town Clerk's Chair.

Gilbert S. Doughty, Architect
14, Fletcher Gate, N.W. 11.

WAYSIDE NOTES.

A GREAT discovery has been made during the progress of some alterations at the parish church of Long Clawson, a village between Melton Mowbray and Grantham. It was scarcely architectural in the ordinary acceptance of the term, though eminently so in a sense, seeing that the builders of the find in question are old-established architects and contractors of high repute, besides being also geometricians of no mean order. Their style of architecture antedates any other.

The discovery made was a large quantity of honey. Whilst taking down the west wall of the church the workmen came upon a "comb" measuring 5ft. in length, and 2ft. in width. It is supposed, I read, that the west end of the church has been inhabited by bees for more than 25 years, as during the whole of that time they have been seen in the vicinity, and not infrequently have been observed inside the church during Divine service. I trust that we shall not take to pulling down our old churches to find stores of honey; for I cannot help thinking of Charles Lamb's Chinaman who set a fashion of burning down houses in order to provide a plentiful supply of roasted pig.

Somebody has been despoiling—in theory—the interior of the renowned church of Wiggenshall St. Mary's. An assertion that the stalls, screen, and lectern had been purloined by certain parties has been shown to be false by correspondents of the *Athenaeum*. The articles in question being safe, we may leave the wordy war to the wagers thereof; but in the letter of Mr. E. M. Beloe, F.S.A., I was interested to read that until 30 years ago the chancel of St. Mary's retained the old Puritan arrangement of seats all round the walls, and the Communion-table in the centre of the chancel. I see, however, that Bloxham, on "The Internal Arrangement of Churches after the Reformation," notes the fact that "in the chancel of St. Mary the Virgin, Wiggenshall, Norfolk, the old Puritanical arrangement is still kept up, the Communion-table being brought out into the chancel with seats all round." My much beloved author gives, as will be perhaps remembered, an illustration of the Communion-table at Langley Chapel, Salop, where the same arrangement is found, or was to be found, some thirty years back.

A note of more than usual interest appeared in the last number of the *Athenaeum*. It is worth reproduction. Says the writer:—"It is the fashion of a certain class of amateurs in architecture to ascribe to the artisan of the Middle Ages those designs for noble buildings which, in their execution, have, since their time, enchanted the world. Architects proper know better, and point to numerous proofs to the contrary, which demonstrate that, except, perhaps, rude instances where prevailing types have been followed without scruple, it is manifest that a system analogous to the modern one obtained in all important cases. We cited the other day an example, where it is recorded that a patron of the 14th century, who was desirous of building on a considerable scale, sent for a monk of Worcester, who designed and superintended the work for him. The incised slabs at Rouen commemorate two now nameless worthies, and show one of them holding a pair of compasses in one hand, and in the other an elaborate design for the tracery of a window. It is obvious from the costumes that these were not artisans. The "Sketch-Book" of Willars de Honcourt, which was published in facsimile by Professor Willis, attests that he was, in the modern sense of the term, an architect of the 13th or 14th century. Street produces several proofs, derived from the bench tables of certain buildings, that they were built from designs proper, and not according to rules of thumb." Here the writer quotes the well-known lines in "Henry IV., Act I. Scene ii., commencing, "When we mean to build," as further proof in the same direction, and remarks that "as architecture in Shakespeare's time was much less difficult, complex, and, above all, scientific than it had been during the Middle Ages, so much less was the latter likely to have been due to rules of thumb."

This line of argument is pleasing at this day when so many hasten to show that an architect should be a craftsman in a smock-frock, an

artisan with a short "clay," a master mason with his nose at the banker, and anything else except himself. Whereas, as our writer endeavours to prove, an architect was an architect in the olden times as well as at the present day. What pleasure or amusement anyone can find in trying to prove otherwise it is not easy to understand.

It will be a pity, from an artistic point of view, if the Emanuel Hospital at Westminster is destroyed. The old hospital has always appeared picturesque to me, and we do not find many examples of this particular class of building in London. That it affords scope for the artist's pencil may be seen from the illustration of the old institution by Mr. Herbert Railton that appeared a week ago in the *Illustrated London News*.

An amusing incident, and one that surely could only have occurred in our glorious profession, happened during the publication of some correspondence relative to the Emanuel Hospital in the columns of the *Times*. "The Purchaser's Architect" writes about the possible future of the building, when lo and behold! another gentleman, giving his own name, says that he thought that he was the "purchaser's architect"! This was edifying, truly. I trust that the rival purchaser's architects came to some understanding in the matter, and that no third party came forward with still further claim to the title—and the prospective job.

Mr. Railton, with his usual prolific industry, having just finished the illustrations of a large work on the Inns of Court, is about to proceed to execute a commission to furnish the illustrations for a series of articles on "Cloister Life in the time of Richard Cœur de Lion." The articles will appear in *Good Words*, and should prove unusually attractive to architects, as no draughtsman is so competent to deal with such a subject as Mr. Railton.

Information on Norwegian churches would be welcomed by all, as Mr. Harry Hems says. There have been so many excursion steamers to the "Land of the Midnight Sun" that there should be some sketches or photographs of new subjects forthcoming. I fancied the other day, as I passed a photographer's shop, that this effect had really been produced, as I saw many photos of Norwegian scenery and buildings.

I trust the attention of the Building Acts Committee of the L.C.C. has been called to the case of a man who, when brought before the police magistrate at Lambeth on Friday on a paltry charge of defrauding a railway company, successfully posed as the district surveyor for South Lambeth and part of Camberwell. It is due to Mr. Henry Parsons, the district surveyor in question, that he should have the opportunity afforded him of proving that this was an impudent case of personation. Mr. Parsons has held this lucrative district surveyorship since 1853, and it is due to his character and position to show that the man fined for an offence so mean and paltry wrongfully assumed his name, status, and address. Doubtless the builders of his district will avail themselves of an opportunity to raise a testimonial to a much-maligned official, to take the form, say, of a free railway pass. The difficulty in this rectification will be that even Mr. Biron, the stipendiary (who ought to know a district surveyor as well as he does the local police inspector) was imposed upon, for he professed to recognise the defendant as a public official, adding that he had formed a very high opinion of his integrity. By the way, the culprit got off very lightly. If the railway officials are to be believed, the defendant had travelled unchallenged and without a ticket for nearly five years. Now the cost of a first season between Waterloo and Shepperton is £22 a year: 22 x 5 = £110, whereas the pseudo-Parsons was only called on to pay £14 5s., including costs.

I was a little puzzled a few morning ago by the announcement on the newspaper posters of "Nelson's Flagship, Latest," but soon remembered that there was a proposal to destroy the *Foudroyant*. Apropos of this, the *Standard* gave some interesting particulars of other famous vessels. The student of naval architecture should regard these old vessels with reverence, even if they fall short of imitation of the

old craft as architects copy old buildings. The *Shannon*, it appears, which fought and captured the *Chesapeake*, was broken up at Chatham, part of the hull being sold at a fancy price. Sir Francis Drake's *Golden Hind* came to a similar end at Deptford, a chair made of her timbers being one of the treasures of Oxford University. The *Resolute*, which went in search of Sir John Franklin, and, after being abandoned in an ice waste, was picked up by an American whaler, and returned refitted by the United States Government to this country, was moored in the Medway for some years afterwards, but ultimately taken into dock and pulled to pieces, a suite of furniture fashioned from her oaken timbers being sent as a memento to the American President. The *Sovereign of the Seas*, the first British three-decker, built in the time of Charles I., "to the glory of the English nation and not to be paralleled in the whole Christian world," was accidentally destroyed by fire at Chatham after seeing much and long service. Of Captain Cook's *Endeavour* not a trace is left, though several of his scientific instruments have been preserved, nor is there any trace of the *Victoria*, which made the first voyage round the world. Several English and foreign war ships which have been sold to the Norwegians are now carrying timber from port to port. GOTH.

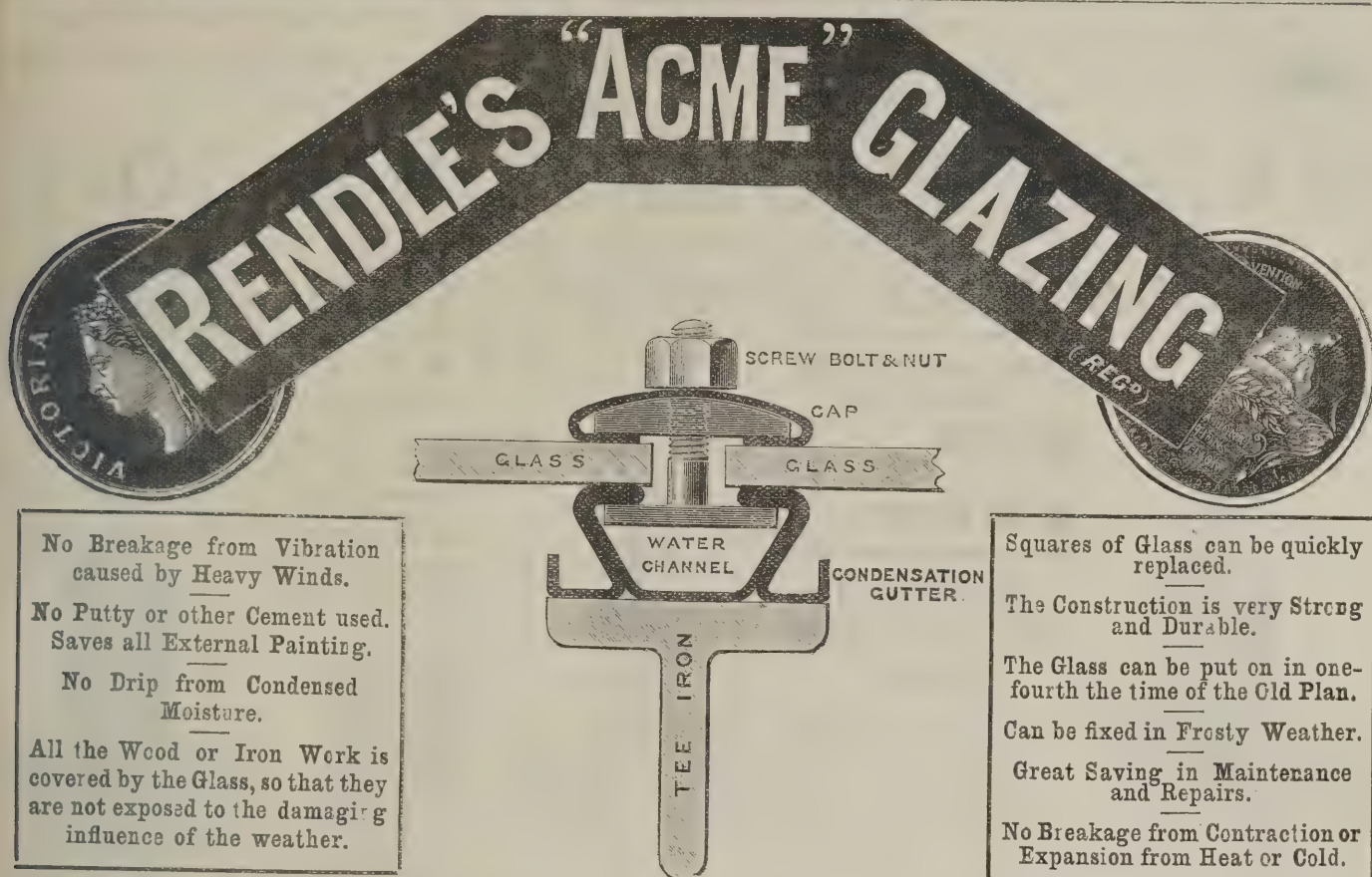
OBITUARY.

THE death is announced of Mr. Joseph Moore, of Birmingham, the well-known medallion and die sinker. Mr. Moore, who was in his 76th year, was apprenticed to Thomas Halliday, a die-sinker who then had workshops in Newhall-street. In conjunction with a fellow apprentice—Mr. John Allen—Mr. Moore entered into manufacturing business in Great Hampton-row, where, under the style of Allen and Moore, the firm largely made engraved metal cups, vases, and boxes. These wares were engine-cut, on bodies coated with colour, and portions being cut away by the lathe, the patterns, chiefly designed by Mr. Moore, were left in colour in low relief. The firm also engaged in the manufacture of papier-mâché ware. Owing to changes of fashion, the enterprise of Messrs. Allen and Moore failed to attain permanent success, the works were closed, and Mr. Moore, having lost all he had, began business for himself as a die-sinker. Most of his work was executed "for the trade." Commissions for medals, portrait medals, commemorative medals, prize medals, not only for Britain, but for the colonies, were intrusted to trading firms; they came to Mr. Moore often for the designs, and always for the execution of the work. Though Mr. Moore employed other artist workmen in his business, the finest of his works were cut from first to last by his own hand. He had a keen appreciation of pictorial and musical art; he was one of the founders and the first president of the Midland Art Club.

Eugène Gonon, the Parisian founder, known to specialists all over the world for his success in casting in bronze by a modification of the *cire perdue* method, which he kept secret to the end, died on Tuesday. The knowledge of this famous process was inherited from his father, Honoré Gonon, and was perfected and continued by Eugène Gonon during more than half a century. Donou and Rodin and other sculptors intrusted to him their work; but he leaves no heir, nor, indeed, a pupil trained in his school. The State a long time ago bought the secret, but it took no pains to utilise it. "His life," says one writer, "which he devoted to the mission of rendering in bronze in the most faithful manner possible the masterpieces of some of his contemporaries, was a rare and remarkable example."

The local board of Bromley, Kent, had 174 applicants for the post of surveyor, recently rendered vacant. They have elected Mr. S. Hawkins, an engineer now in the South-Eastern Railway Company's service.

The old church of Prestonkirk, East Lothian, was reopened on Sunday after extensive alteration in its interior. The fabric consists of a fine chancel of the 13th century, nave of the 17th century, and a quaint tower of unknown date. The alterations that have taken place consist of a perforation of the western wall, opening into the vestry, arching and screening the whole wall with a carved and panelled screen of wood, entire repainting of the church and seating, enriching of the windows, and minor improvements.



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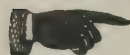
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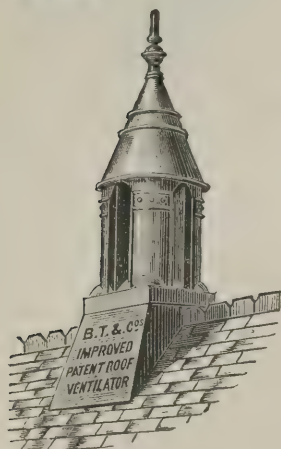
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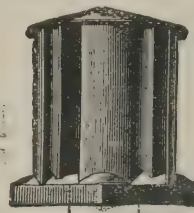


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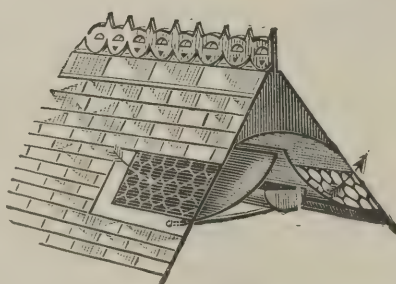


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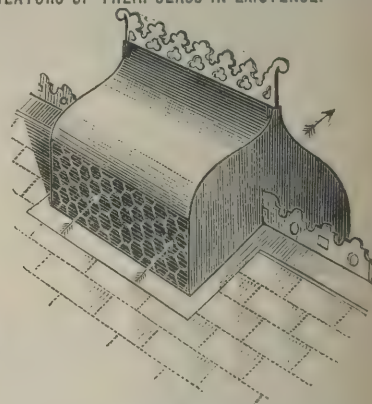
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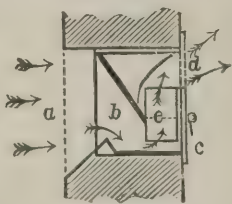
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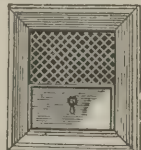
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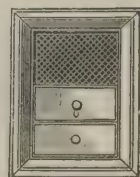


PANEL
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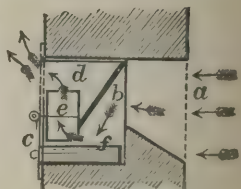


PANEL
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FROM
10/-
EACH.



No. 42A.
With Water Tray.



No. 42A.—SECTION.

B. T. & Co. will at all times be pleased to advise upon the Ventilation and Warming of Buildings, and are prepared to guarantee that if their system is carried out in accordance with their recommendations, it will be found to give complete satisfaction, and to be perfectly free from those objectionable draughts and noise so often complained of in Churches, Halls, and other Buildings, by the improper use of unsuitable appliances.

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estimates the cost of an entire preservation at about £450.

The Sussex Archaeological Society, at a general meeting, were "of opinion that every effort should be made to secure the preservation of so interesting an example as the Old Vicarage House of Alfriston"; "with this opinion the Society for the Protection of Ancient Buildings cordially agrees, and for the way of sustaining the building thinks that the general report of the architect, Mr. Owen Fleming, of July 25th, 1892, is based on the right lines."

As soon as funds are forthcoming, and before further outlay, steps will be taken to arrange with the patron and Bishop to secure the building to the parish for ever, as a reading-room and for other parochial uses.

Subscriptions and donations will be thankfully received by the bankers, Messrs. Molineux, Lewes; by the treasurer, Major Molineux, Old Bank, Lewes; or by the Vicar, the Rev. F. W. Beynon, Alfriston Vicarage, Berwick, Sussex.

Cheques, postal orders, or post-office orders should be crossed "Old Bank, Lewes, Alfriston Old Clergy House Preservation Fund." All remittances will be publicly acknowledged.

I most earnestly appeal to all lovers of old work to help me to preserve from destruction this interesting relic of former days.—I am, &c.,

F. W. BEYNON, Vicar.

Alfriston Vicarage, Berwick, Sussex, Sept. 15.

INCOMBUSTIBLE CONSTRUCTION.

SIR,—Having freely experimented with a view to render buildings fireproof—where the risks are great—in as inexpensive a way as possible, I read with much interest the article under above heading which appeared in your last issue. There is no doubt that hollow wooden studded partitions, or match-board lining, to walls with a space behind, such as are largely used in City warehouses, must inevitably, by means of the induced draught, carry the fire from one story to another. If the space between match-boarding and wall be filled in with an incombustible material, the risks of fire spreading would be minimised, and, in fact, there could be but little chance of perfect combustion. Experiments made with silicate cotton prove that it is almost impossible to burn down any structure lined at the back with that material, and this is simply from the fact that when the wood carbonises it offers resistance to the influences of extreme heat, and unless sufficient oxygen can be obtained between the wood and the lining, there is no chance of consuming it. My experience, based on practical experiments, is perfectly consistent with that expressed in your article—viz., that hollow spaces, or rather, spaces between studded partitions and walls, should be done away with or filled up so as to prevent the spread of fire by the induced draught to which I have referred. By filling up any space with silicate cotton, the oxygen is only retained in finely bisected air-spaces, and without this element in full volume, combustion is quite impossible. I have seen a wooden door lined with silicate cotton withstand greater heat than a double iron "fireproof" party-wall door, simply because the lining at back of the wood so effectually prevented the heat from penetrating, that, for all practical purposes, it might have been used as a door again, whilst the iron doors, subjected to the same degree of heat, become totally useless. Buildings used either as warehouses, dwelling-houses, or offices, could undoubtedly be rendered completely fireproof in a simple and inexpensive manner.—I am, &c.,

FREDK. M. H. JONES.

Mr. James Coles, master builder, of Kimberley, South Africa, was recently killed by the fall of some scaffolding on a building in progress. He was a son of Mr. James Coles, of Burnham, Somerset, and had been in business as a builder and contractor in Kimberley about ten years; some of the largest stores in the town were built by him.

The foundation-stone of a Technical School and Free Public Library for Leigh was on Saturday laid by the Hon. John Powys. Mr. Marsh, chairman of the Leigh Science and Art Classes, explained that the number of students was now so large that the present provision was totally inadequate. The building would cost over £10,000, of which £6,500 had been subscribed by the public, and the remainder by the local board.

Intercommunication.

QUESTIONS.

[10848].—**Books for Student Surveyors.**—I have just article a boy to a surveyor and valuer—an all-round country man of good standing, with a fair auctioneer's business. I want the boy to pass the successive examinations at the Surveyors' Institution, with the view of settling him ultimately in some such position as his master's—say, not a genius, but steady and plodding. What are the best books to supply him with as he goes along, and what else can I do to facilitate his improvement?—KAPPA.

[10849].—**Swedish Wooden Houses.**—Can any of your readers inform me what are distinctive features and advantages of Swedish wooden houses? I have seen a description of them in a non-professional paper, and should be glad to learn if they can be rendered reasonably fireproof by means of layers of asbestos. I should also be glad to know (approximately) what saving per cent. would be effected on the cost of building in brick in a town where bricks are fairly cheap? Briefly, is it a practical method of building for such purposes as vestries, meeting-rooms, &c.?—ALPHA.

[10850].—**National Competition Drawings.**—Will any readers give me any information regarding drawings in building construction for the National Competition, such as the scale that they are drawn at and the style of colouring, if coloured, or if done in black and white, and if a perspective view is required?—APPRENTICE ARCHITECT.

[10851].—**Bedding Iron and Wood on Stone.**—When the end of an iron joist or girder has to rest upon a stone template, is anything necessary between the iron and stone besides a bedding of mortar or cement? The writer had supposed a piece of sheet-lead was the proper material to use, until reading an article in the *Building News* for May 6, in which it is stated that experiments showed a great reduction of the crushing strength of stone by using lead, the reason being the lateral flow of the lead under the great pressure. Thin pieces of soft pine, it is stated, were still more destructive of strength. Will friends kindly give opinions as to the best way of placing the ends of iron joists or girders; also heavy wood bressummers on hard stone templates?—J. H.

[10852].—**Tidal River Bath.**—I should be glad if any correspondent would give me the correct internal diameter of a pipe necessary to fill a bath holding 240,000 gals. of water, which has to be taken from a tidal river that will flow over and cover the pipe for one hour. The pipe is covered its entire depth for the whole period, as a small coarse-gravel filter will be built to the level of top of pipe at intake. The greatest head of water will be 4ft.; but by that time water in bath should be level with—TIDAL WATER.

[10853].—**Durability of Cast-Iron Pipes.**—I should like to know if any authenticated records are to be obtained as to the durability of cast-iron water-pipes laid on soil. How many years have pipes so laid been known to last, and what soil is the best?—CONTRACTOR.

[10854].—**Laboratories.**—In a school in which technical instruction is to be carried on, and magnetic experiments made, certain benches are required which shall be free from vibration. Of what material should these benches be made, and what precautions are necessary in their construction? Perhaps one of your many practical readers who have built physical laboratories could favour with some particulars.—ENQUIRER.

[10855].—**State of Boiler and Hot-Water Pipes.**—Will any experienced reader oblige by saying how the condition and safety of a boiler fixed at the back of an ordinary kitchen can be ascertained? During a brisk fire in the latter a loud and explosive noise takes place in the upper hot-water cistern fixed in bath room, and this continues several seconds, and recurs at intervals. The noise proceeds evidently from the bubbles of steam which burst against the top of cistern, which is of wrought galvanised iron. I think it is caused by the reduction of the flow-pipes by incrustation; am I right? Any information as to testing condition of pipes and boiler would be of value.—HOUSEHOLDER.

[10856].—**Folkstone.**—I shall be obliged if any one who knows the neighbourhood will give the names of any old buildings, churches, &c., within reasonable distance.—TOURIST.

REPLIES.

[10833].—**Timber and its Position.**—The reason for placing staves inversely to their natural direction in the tree is because the sap-valves open upwards from the root, and when thus reversed they prevent the ascent of moisture in the wood. I hope this explanation will remove the doubt from the mind of "Philos."—SIDNEY F. HARRIS.

[10842].—**Composition for Renovating Stone-work.**—Try "Fluate," a process discovered by M. Kessler, and largely used on the Continent, the material being supplied by the Bath Stone Firms, Limited. The company supply small quantities, and give instructions. The process prevents decay and arrests disintegration. For Bath and all limestones the process has been found effectual; it is chemical in action, and the resulting products are insoluble. The "fluate" is applied liquid in one or two solutions; it enters the stone and solidifies, and is unaffected by the atmosphere and acids. Before using, all loose and decayed parts of the stone must be removed by a stiff brush and the walls cleaned down, but quite dry. It is applied by a flat brush and produces an effervescence; when this ceases, the application is sufficient.—G. H. G.

A committee has been chosen at Halifax with a view of carrying out a scheme of electric tramways in the town, on the same system as that adopted at Bradford. Messrs. Utley and Gray, conjointly with Mr. Holroyd Smith, are acting as engineers and surveyors for the Halifax scheme.

Legal.

THE LAW OF BUILDING SOCIETIES.

BUILDING societies are just now having a very bad time, owing to the great fall in the value of land and house property during recent years. This is, however, only one cause of the failures which have lately been so common, and others must be sought in the reckless way of paying high interest upon deposits to bring in large sums of money that could not possibly be safely invested again at paying profits. Hence we have had some big crashes amongst those concerns, and shall probably see some more before long. In the meantime, the rules of law and of practice applicable to building societies, whether in their working or their winding up, become more generally interesting and important. For this reason we may welcome the issue of a second revised and enlarged edition of Mr. Wurtzburg's "Law of Building Societies" (Stevens and Sons, Ltd., Chancery-lane, price 14s.) It should at once be stated that though this is technically termed a second edition, because the same author published the Building Society Acts with notes, it is really an entirely new book, having been wholly re-written as a treatise upon this important subject. It is now in a fair way to become the standing textbook and leading authority upon the law of building societies. The work, indeed, has been done very well and thoroughly; it brings all questions and the latest authorities down to date; it contains, besides all the statutes, various useful precedents of rules, mortgages, and deeds, and it is so clearly written as to be quite readable even by those who are not lawyers.

Like most good ideas, that of a building society has fallen upon evil days by being wrongly applied in practice. The original notion was simply the creation of a common fund by subscribers, out of which some were to obtain advances upon thoroughly sound security. As long as a building society kept within the scope of that definition it could come to no harm, and so such concerns acquired a reputation for safety. Then they grew and got bigger. Depositors came in with their money at high rates of interest, which had to be put out at still higher rates. This could only be done by lending much closer to the value of the property offered, and by lending to everyone who became a nominal shareholder for that purpose. In came the artistic and speculative builder. Surveyors were weak, or worse. Directors and secretaries wanted more business, so did the solicitors. Then from being a building society the concern became a company, doing a big pushing trade in doubtful mortgages, and with a general fall of property, and a few large losses from insolvent builders, such a society was shaken to its frail foundations, and ready to fall at any moment of undue pressure. And so many are now falling to pieces accordingly.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

Z. O. M.—**DRAINS.—CONNECTION.**—Unless some right of way or water is created by the deeds, I do not consider that A is legally bound to allow C to come upon his land for the purpose of connecting the drains. This would be more clear if there is any written acknowledgment as to the rent paid formerly for permission to do so.

J. H. C.—**BUILDING.—PARTY-WALL.**—I consider the upper portion of this wall is not a party-wall, but a wall built upon another wall below, and therefore entitled to support. Neither does it seem clear that the wall it is sought to pull down is itself a party-wall, for by the sketch there seem to be two distinct walls side by side. The only safe way to proceed seems to me to shore up the adjoining dwellings.

INFRA DIG.—**ARCHITECT.—EXTRAS.**—It may depend upon what the contract says as to extras, but if it left the extras, in the sole discretion of the architect, then his certificate would be final between all parties, and it would not be inquired into except for fraud on his part; still it might be wiser to give an account.

J. H. W.—**DILAPIDATIONS.—SURVEY.**—No, I do not consider that any valuer's license is required by an architect and surveyor, or in relation to such work upon property.

At West Derby parish church, Liverpool, on Friday, a new organ, built by Messrs. Gray and Davidson, of Liverpool, was opened. It contains 244 pipes and 40 stops.

LEGAL INTELLIGENCE.

A DISTRICT SURVEYOR FINED FOR DEFRAUDING A RAILWAY COMPANY.—At Lambeth on Friday Henry Parsons, of Shakespeare-road, Herne-hill, and Hampton Wick, appeared to answer four summonses, taken out by the London and South-Western Railway Company, for having travelled on June 29 last and other days, without having previously paid his fare, with intent to defraud. Mr. Horace Avery prosecuted, and said the defendant was the district surveyor for South Lambeth and part of Camberwell. It was alleged that for years past he had been travelling on the railway without taking any ticket at all. He was formerly a season-ticket holder, and the last of such tickets he held, between Waterloo and Shepperton, expired in October, 1887. Ever since October, 1887, he appeared to have been in the habit of travelling daily between Hampton Wick and Waterloo, usually getting out at Vauxhall, but occasionally travelling from Hampton Wick to Loughborough Junction. During the whole of this time he passed the collectors at both places as a season-ticket holder, and had never been challenged owing to the position he was known to occupy. A number of railway officials in the employ of the South-Western and Chatham and Dover Companies having been called in support of the summonses, the defendant, in reply, said he had been a season-ticket holder for a number of years, and had got into the habit of walking past the collector without giving up his ticket. He found he was losing money by a season-ticket as he travelled very little during the winter, and he therefore took return tickets. On the day mentioned in the summons he had not time to get his ticket, and offered to pay his fare at the other end. It was absurd to say that a man of his character and reputation would be guilty of so paltry an offence. Mr. Biron said he deeply regretted to say that he had come to a different conclusion. He had no doubt that for years past the defendant had been travelling without a ticket, availing himself of his position to pass as a season-ticket holder, and thus to defraud the company. He said this with the greatest possible regret, because he had known the defendant as a public official, and had held a very high opinion of his integrity. He ordered the defendant to pay a fine of 40s. and £5 5s. costs on each of two summonses, the two other summonses being withdrawn.

RE ALFRED KINGABY.—Under the failure of this debtor, a builder and decorator, carrying on business in High-road, Lower Clapton, a summary of accounts has been issued, the liabilities being returned at £1,375, and net assets £49 10s.

CARPENTERS SUED FOR BREACH OF CONTRACT.—At the Hereford Police-court, last week, John Smith, wheelwright, and Arthur Pugh, carpenter, were summoned by Messrs. Johnson Bros. for £1 9s. each for breach of contract. Arthur Johnson, of the firm of Johnson Bros., contractors, of Queen-street, Cardiff, said he saw both men on the 20th August at the yard of Messrs. W. P. Lewis and Co., builders, Hereford. He engaged Pugh for a week, to rough-board the roof of a malt-kin at Chepstow. There was nothing unusual in the job. He engaged Pugh at 7½d. an hour, which was above the average rate, and paid him 2s. 6d. for his week's lodgings, and 4s. 6d., the amount of the single railway fare. Smith subsequently came and said he would go, and was also paid his railway fare. Plaintiff heard from the foreman that the defendants had refused to do the work, and had been given their railway fares to return. In cross-examination, the plaintiff said that it was not true that the work was of a dangerous nature, or that any accidents had taken place on the roof, and that the amount claimed would not cover the amount of the loss occasioned by the defendants' breach of the contract.—William Ganderton, foreman to Messrs. W. P. Lewis and Co., corroborated, and other witnesses said the work was not dangerous. The defence was that the roof was dangerous, and that defendants had not been warned of its character. Defendants' counsel quoted "Chitty on Contracts," to the effect that where there had been a fraudulent misrepresentation or concealment of a material fact, the contract was voidable.—The chairman said that there was no sort of concealment of a material fact as to the difficult nature of the work. The Bench gave judgment for the plaintiffs for the full amount claimed, and costs.

In connection with the Salvation Army at Sheffield, the foundation-stones of a new citadel, which is about to be erected on a site near the town hall, were laid on Monday. The building, which will cost £17,000, will contain an assembly hall with accommodation for 2,000 persons.

At Friday's meeting of the city council of Coventry it was agreed to proceed with the restoration of the north window of St. Mary's Hall, at an estimated cost of £629. That this is desirable is evident from the statement of Alderman C. J. Hill, who said that some of the kings represented had their legs under their arms, and one man had part of a castle in the pit of his stomach.

WATER SUPPLY AND SANITARY MATTERS.

LLANDAFF.—The city of Llandaff, which is in the district of the Cardiff rural sanitary authority, will, in a few weeks, be supplied with water from the Cardiff Corporation's new waterworks in Breconshire. A few years ago all the wells in the city were closed by the sanitary authority, and since then houses have been supplied with water for drinking purposes by water-vans from a reservoir on a lower level, which has been a constant source of annoyance to the inhabitants and anxiety to the officers of the rural authority. The city is drained on the intermittent downward filtration system, which works well. All the manholes are air-tight, and the whole system of sewers are ventilated by three ventilating shafts, situated about three-quarters of a mile apart. One of these, 40ft. in height, was built of masonry in 1886 by the late Mr. Waring, C.E., of Cardiff. In 1889, Mr. Fraser, Assoc. M.Inst.C.E., surveyor to the sanitary authority, ascertained that this shaft was not only inadequate, but very expensive, owing to the enormous quantity of coal-gas required to raise the temperature within a masonry shaft 2ft. square inside sufficient for the ventilation of the sewers, even a short distance away. He therefore designed and erected two cast-iron columns, each 12in. in diameter at base, and 20ft. high, fitted with two Bunsen gas-burners, surmounted by a concave plate a few inches from the burners, which is kept at a red heat by a reduced flame from one of the burners, consuming the sewer-gas as it is extracted from the mains by the strong current caused by the high temperature of the column. These shafts answer the purpose admirably, being both economical and effective, having cost £35 each, fixed complete, and an annual cost of under £10 for gas, and each column will ventilate sewers for a radius of half a mile. This ancient city, with its noble piles of historic buildings and beautiful cathedral, has been very much neglected up to a few years ago, and the present more satisfactory state is the outcome of an intelligent sanitary authority, guided by their energetic officers.

LONG EATON WATERWORKS.—The opening ceremony of these works took place on Thursday week. The supply is derived from the Millstone Grit formation at Stanton Barn, in the parish of Melbourne, which is twelve miles distant from Long Eaton. The well is 60ft. deep, 11ft. in diameter, and at a depth of 50ft. adits or tunnels 5ft. high and 6ft. in width have been driven to collect the water. The south tunnel is 506ft. in length from the face of the well, and the north tunnel 1,104ft. From the north tunnel there are three branches to the northeast and one to the north-west, the total length of all the tunnels being 2,250ft. Besides the tunnel works, two large bore-holes were put down to the lower rock at a depth of 220ft., which yield a large quantity of water, and these are controlled by specially-designed valves, so that the lower water can be used or not, as may be desired. The capacity of the reservoir is half a million gallons, but land has been purchased for duplication when necessary. From the reservoir at Castle Donington the water gravitates to Long Eaton, a distance of nearly six miles, the main crossing the River Trent at Sawley Bridge. The principal industry at Long Eaton is the manufacture of lace, the factories being very large, and the town has in the past suffered severely from disastrous fires. The local board therefore laid great stress upon securing sufficient fire protection for their town. The mains have therefore been laid of exceptionally large size, and constantly charged at a pressure of 212ft. The general contractors for the works were Messrs. Price and Shardlow, of Nottingham, who have executed all the work for the Long Eaton local board and the authority of Castle Donington. Mr. G. F. Todd, of Derby, was the contractor for all the works executed at the expense of the Melbourne Authority. The engineer is Mr. George Hodson, M.Inst.C.E., F.G.S., of Westminster and Loughborough.

PURIFICATION OF LANCASHIRE RIVERS.—The work of improving the condition of the Irwell and the Mersey is slowly but surely progressing, and several authorities have recently moved in the matter. Last week the Mossley Town Council had the question under consideration; and the Rivers Pollution Prevention Committee submitted their report. It was decided to engage Mr. Theo. S. McCallum, C.E., of Manchester, to prepare a scheme for the interception and purification of the sewage of the town, with the view of obtaining the early sanction of the Local Government Board for the necessary borrowing powers.

The mission church built in Walworth, S.E., at the cost of the Pembroke College, Cambridge, Mission, will be consecrated on Oct. 1. Mr. L. S. Prior, M.A., an old Pembrokeian, is the architect of the church, which, like that of the Corpus Mission in Camberwell, has its club and classrooms in the basement.

Our Office Table.

THE Incorporated Association of Municipal and County Engineers will hold a meeting at Belfast on Friday and Saturday in next week, the 23rd and 24th inst. On the Friday the members will visit the Belfast Waterworks under the guidance of Mr. Robert Corry, the chairman of the waterworks committee. In the evening a conversazione will be held at the Queen's College. On the Saturday, after a council meeting, the members will meet at 10.30 a.m. in the City Hall, when the following papers will be read and discussed: "Progress of Municipal Affairs in Belfast," by Mr. J. C. Bretland, M.Inst.C.E., City surveyor; and "Londonderry, with some Notes on its Engineering and Sanitary Progress," by Mr. W. J. Robinson, A.M.Inst.C.E., city surveyor. In the afternoon there will be a visit to Queen's Bridge, Albert Bridge, and Main Drainage Works, and later on a reception at Ballymenoch House, County Down, by the Lord Mayor and Lady Dixon.

LAST year the Society of Architects, during their interesting and instructive tour in Belgium, visited Louvain, and went over the ateliers of Messrs. J. A. Poyers Bros., and were greatly pleased with much they saw there. The firm was by no means a new one, having been established in 1784 by the original Poyers, and some of the journeymen sculptors have worked in the same employ upwards of 45 years. Our readers generally, and those who formed the party in question more particularly, will therefore learn with surprise and no little regret that the firm is now broken up, and the many works of art the studios contained—the collection of more than a century—are scattered far and wide. The sale began on the 30th of last month, when the models, &c., went to the hammer. The auction was renewed on Thursday of last week, at which the machinery—some of the most complete of its kind in the world—was disposed of. Last Tuesday was devoted to the sale of the timber, marbles, &c., and the day following the works of art, &c., were sold. There were, in all, nearly 2,000 lots.

CONSIDERABLE correspondence is appearing in the Glasgow papers on account of a report from a committee of the town council, who state that the joisting of the new municipal buildings, built two years ago from Mr. William Young's designs, is infected with dry rot, which it is said will cost over £4,000 to remove. A correspondent of the *Glasgow Herald* asserts that the rot can be cured for £20, if the deafening be removed and a few holes knocked through the walls to give ventilation. The correspondent has the courage of his opinions, for he offers to give the £20 to the local infirmary if he does not succeed in checking the progress of the evil for the sum named.

THE new scale of fees charged for advertisement hoardings by the City Commissioners of Sewers is complained of as too high, while the regulations are alleged to be unnecessarily stringent. Fourpence per foot superficial is demanded for the first six months, and 6d. per foot afterwards in first-class streets and the return frontages thereto, and 2d. per foot superficial per month for the first six months and 3d. afterwards in all other streets. These rates, with the announcement that the charge for all hoards will be calculated on the assumption that they are to be 40ft. high, are said to make the advertising practically prohibitory, and on Tuesday, the City Commissioners of Sewers received an influential deputation of architects, builders, contractors, advertising contractors, and others, who presented a numerous signed memorial asking for a modification of the terms. The deputation claimed that there were benefits accruing to the public by hoards being licensed for advertising purposes in the prevention of dust and dirt during the removal of buildings, and in the exhibition of bills and pictures of an unobjectionable character, while the disadvantages attending the refusal to license hoards except at prohibitory fees were many. A charge of 10s. per 100 superficial feet per month for principal streets, and 5s. for others, as in the Strand district, would, they submitted, sufficiently meet the justice of the case. The memorial was referred to the Streets Committee for consideration and report.

It is stated that the Jarrah wood block paving

laid down at Kensington wears well, and is very uniform in quality. Several thousand yards have been laid. The blocks are 4in. and are close-jointed, and the surveyor, Mr. Weaver, reports well of the paving. At Hammersmith the same paving in 5in. blocks, with joints of ½in. in cement grout, has been put down. The close joints are said to wear best. On Brixton and Streatham Hills the Jarrah wood block has been laid, and a very excellent and even surface is the result, though it is laid in connection with the tramcar lines.

THE Rugby Rural Sanitary Authority have recently passed a resolution to abolish the by-laws in force for six parishes in their district, thinking it preferable that there should be no by-laws at all than that only a portion of the parishes should be affected. On being applied to for their sanction, the Local Government Board saw no reason for the proposal, and asked for a report of the medical officer upon the subject. Dr. Wilson had submitted a report, to the effect that he was strongly of opinion that the resolution should not be approved, and instead of rescinding the by-laws, he recommended that they should be extended to the whole of the parishes in the union, so that the board could have control of the water supply and sanitary arrangements. At the meeting of the authority, Dr. Townsend and others contended that the by-laws retarded building operations in villages. The building restrictions required an 18in. wall where a 9in. wall would do, and a 9in. where a 4½in. would do; and there were other unnecessary requirements, the result of which was that a person could not build a labourer's cottage under about £160 or £180. No labourer could afford to pay 5 per cent. on that, and the result was people would not build houses. The clerk pointed out that, while the by-laws might discourage building, they also discouraged the perpetration of nuisances. It was decided to await the reply of the Local Government Board to Dr. Wilson's report.

THE syllabus of the lectures to be given in the engineering department of the City of London College, White-street, Moorfields, by Professor Henry Adams, M.S.A., &c., has just been published. The courses, which open in the first week in October, include classes in civil engineering (a new departure), technical drawing and building construction, mechanical engineering, calculation of strains, quantity, town, and land surveying, and engineering field work. Mr. Henry Adams's name alike as a professor in his college and as a writer of handbooks and lecturer on scientific subjects stands deservedly high, and his students have been very successful.

ACCORDING to Mr. Stringer, the British Consul at Chiangmai, Northern Siam, the teak trade on the Meinam is declining at an alarming rate. At Chainat, the Customs station for the upper part of the river, 60,000 logs of teak passed in 1880, 30,000 in 1890, and only 9,500 last year. This is due to deficient rainfall, and to the effect of the indiscriminate working. Teak saplings are cut down in large numbers, and the clause in the leases forbidding the felling of small trees is disregarded. The consequence is that in Chiangmai there is reason to fear that in five years the only teak left will be that which is too far from the water to be profitably worked, and in Lakhon the foresters complain that all the best trees have already been felled.

The parish church of Hipswell, near Richmond, Yorks, was reopened on Wednesday, after restoration at a cost of over £1,200.

The Ruskin Museum at Meersbrook Park, near Sheffield, which has been closed for three months whilst undergoing internal improvement at a cost of £600, has been reopened to the public. New glass roofs have been placed over the picture galleries and the mineral room, and the buildings ventilated. The collection of Turner's pictures, which represent the artist's work throughout his life, are now on view at Meersbrook, having been lent from the National Gallery until November. While the museum has been closed, the curator, Mr. White, has visited Italy, and gone over what to art students is known as "Ruskin's ground." He went to about a dozen of the chief towns and cities, and on behalf of St. George's Guild collected from 200 to 300 photographs of pictures and of architecture, about which Mr. Ruskin has written very fully, or of which there are studies on the walls of the museum. The photographs will be mounted, and will be available to the public under the ordinary conditions of the use of the library.

The Architectural Association.—The offices of the Association will be reopened on September 26.

ERNEST S. GALE } Hon. Secs.
F. T. W. GOLDSMITH }

CHIPS.

Extensive additions are being made to Whittington Heath Barracks, Lichfield, for the War Office. The work has been intrusted to Mr. John Gethin, of Shrewsbury, for the sum of £18,732 10s.

The Dean and Chapter of Ely have received promises of nearly £5,000 towards the sum necessary for the repair of the cathedral.

About forty members of the Glasgow Archaeological Society visited Peebles on Tuesday, and proceeded to Neidpath Castle, which was described by Professor Veitch. The party then drove to Traquair House, a description of which was given by Mr. Duncan, the secretary of the society.

Plans of school buildings for the parish of St. James, Moss Side, have been prepared by Mr. J. Lowe, architect, Manchester. Accommodation will be provided for over 600 day-scholars.

On Monday the Swindon and district highway board appointed a surveyor in the room of Mr. C. Cole, who has resigned. There were 28 candidates, and Mr. Green, of Oundle, was elected.

There has just been cast at Munich the equestrian statue of the Emperor William I. destined for the conquered city of Metz. It will be inaugurated there with great pomp by the young Kaiser on Tuesday next, the 13th inst. The bronze has been executed by Professor Ferdinand von Müller.

During the past week some Anglo-Saxon graves in Watt's-avenue, Rochester, have been opened under the direction of Mr. George Payne, F.S.A., the secretary to the Kent Archaeological Society. The finds include an iron spearhead, several knives, a cinerary urn, and some opaque glass beads.

At the annual distribution of prizes in connection with the Manchester School Board science and art classes on Friday, it was stated that out of 29 of the most valuable prizes of the year offered to all the schools in the United Kingdom eight had been taken by Manchester.

A new vicarage is being built at Stoke, near Coventry. The contract has been taken at £2,510 by Mr. Thomas Collins, of Tewkesbury.

The Stafford Town Council have raised the salary of Mr. Bell, the gasworks manager, from £400 to £500 a year.

The Board of Trade proposes compiling statistics for the Blue Book relating to 350 of the largest building firms, master plasterers, master painters, &c., of the United Kingdom.

The new railway from Jaffa to Jerusalem is completed, and the first locomotive arrived at Jerusalem on Tuesday.

The works committee of the Dundee Gas Commission accepted on Monday offers for the erection of the new offices for the commission in Commercial-street. The total contracts amount to £6,700.

A stained-glass window, representing "Christ's Sermon on the Mount," has just been erected in the City Temple, to the memory of the late Matthew Mowson Proctor. It is from the studio of Mr. Thomas Grew.

The grammar school, Henley-on-Thames, is being warmed and ventilated by means of Shorland's patent Manchester stoves, the same being supplied by Mr. E. H. Shorland, of Manchester.

A credence table of polished marbles and stone has been placed in the Mission Church at Milborne Wick as a memorial. It is Early English in style, and has been executed from the designs of Mr. Henry Hall, F.R.I.B.A., of London, by Messrs. Harry Hems and Sons, of Exeter.

The work of restoration at St. Mary's Church, Uttoxeter, carried out in sections from plans by Mr. Charles Lynam, of Stoke-on-Trent, has just been completed by the opening-out of the west entrance. Messrs. Ward and Sons, of Uttoxeter, were the builders. At the same time the west window has been filled with stained glass by Messrs. Ward and Hughes, of London.

An order has been made for the discharge from bankruptcy of James Greenwood (trading as James Greenwood and Son), Sutton, Maltby-street, Bermondsey, S.E., and Cannon-street, City, builder and contractor—discharge granted.

An obelisk of red granite, 7½ft. high, with a pedestal of black porphyry, said to surpass in beauty both Cleopatra's Needle and the column on the Place de la Concorde, is shortly to be brought to Austria from Alexandria, where it has been lying in the Garden of the Austrian Consulate since 1847. It is to be erected at Trieste, to which town it was long ago bequeathed by the late Austrian Consul, Herr Laurin.

Trade News.

WAGES MOVEMENTS.

LONDON BUILDING TRADES FEDERATION.—A meeting of working men, under the auspices of their federation, was held on the Fair-field, Kingston-on-Thames, on Sunday morning, for the purpose of appealing to "all workers in the building trade to join hands and be ready for the all-important change to take place on November 1st." There was a very large attendance, over whom Mr. J. Nunn (Operative Bricklayers) presided. The speakers included Mr. Joseph Verdon (secretary London Building Trades Federation), Mr. H. Barnes (Amalgamated Society of Carpenters and Joiners), Mr. J. Rogers (secretary Battersea branch Amalgamated Society of House Decorators and Painters), Mr. Herring (Operative Bricklayers), and Alderman Taylor, L.C.C.

BELFAST.—The long continued strike in the building trade in Belfast was settled on Saturday afternoon on the basis of the employers agreeing to give 7½d. an hour, on the understanding that the question is not to be again raised till 1894. The men demanded 8d. per hour. In the compromise effected the plasterers are not affected.

BROMLEY, KENT.—After a strike which had lasted over five weeks, the bricklayers in Bromley returned to work on Monday, having obtained their request for ½d. per hour extra, in accordance with the new code of working rules agreed to at the last Building Trade Conference for the regulation of hours and wages in the whole of the suburban district.

CARDIFF.—A resolution has been passed by the London Building Trades Committee expressing sympathy with the Cardiff bricklayers, masons, plasterers, and plumbers who have been on strike for 18 weeks, and recommending their case to the favourable consideration of the various trades.

The War Office have determined to spend £16,000 on the erection of additional buildings on the north side of Hounslow Barracks, including two blocks of married quarters, each to accommodate 16 families. The first contract, for £8,000, has already been sealed, and the work is to be put in hand at once, under the direct supervision of the Royal Engineer Department.

At a meeting of the Governors of University College, Dundee, held on Monday, it was agreed to confirm the resolutions of a previous meeting in reference to the extension of the college buildings. These provide for the alteration and extension of the east block of the college buildings and for the improvement of the front elevation at a cost not to exceed £5,000.

An iron highway bridge at Gala, N.B., replacing a wooden one carried away by a flood, was opened on Friday. The bridge is over 100ft. in length and 26ft. wide. It rests upon abutments at each end and three piers—all being built of brick and sandstone masonry. The normal waterway of the river is spanned by iron girders, with lattice screen sides 4½ft. 10in. long. These girders forming a single span rest upon two principal piers. The remainder of the roadway at either end is carried on steel beams.

Major-General H. D. Crozier held a Local Government Board inquiry at Hanley on Tuesday into the application of the town council for sanction to borrow £16,000 for the purpose of laying out public walks and pleasure grounds, £2,000 for sewerage works, and £800 for street improvements. Evidence was given to the effect that the money was required for the laying out of nine acres situate at Northwood as a public pleasure ground for the East Ward, and of eleven acres, situate at Etruria, as a similar provision for the North Ward. There was considerable opposition raised against the site of the Northwood Park.

A statue to the Very Rev. Dean Bickersteth, D.D., to whose exertions the restoration of the west front of Lichfield Cathedral was due, has been added this week to the figures that adorn the west front of that cathedral. At the time the other figures were placed in position, one of the rural deans obtained subscriptions to provide a figure of Dr. Bickersteth, and the order was placed with Mr. Ingram, a London sculptor, who has carried out his commission. The figure arrived in Lichfield, but was not fixed, the chapter having previously resolved not to allow the figures of any living person, the Queen excepted. Now that Dean Bickersteth is about to vacate his appointment and leave Lichfield, the chapter have allowed the figure to be placed in its proper position. A vacant niche was left on the north side of the north-west turret in the third row of figures. The statue has been erected by Mr. Bridgeman. Dr. Bickersteth is represented in a standing position, in full clerical attire, holding a Bible in his left hand.

New Pulpit & Choir Stalls

S. S. MICHAEL AND ALL

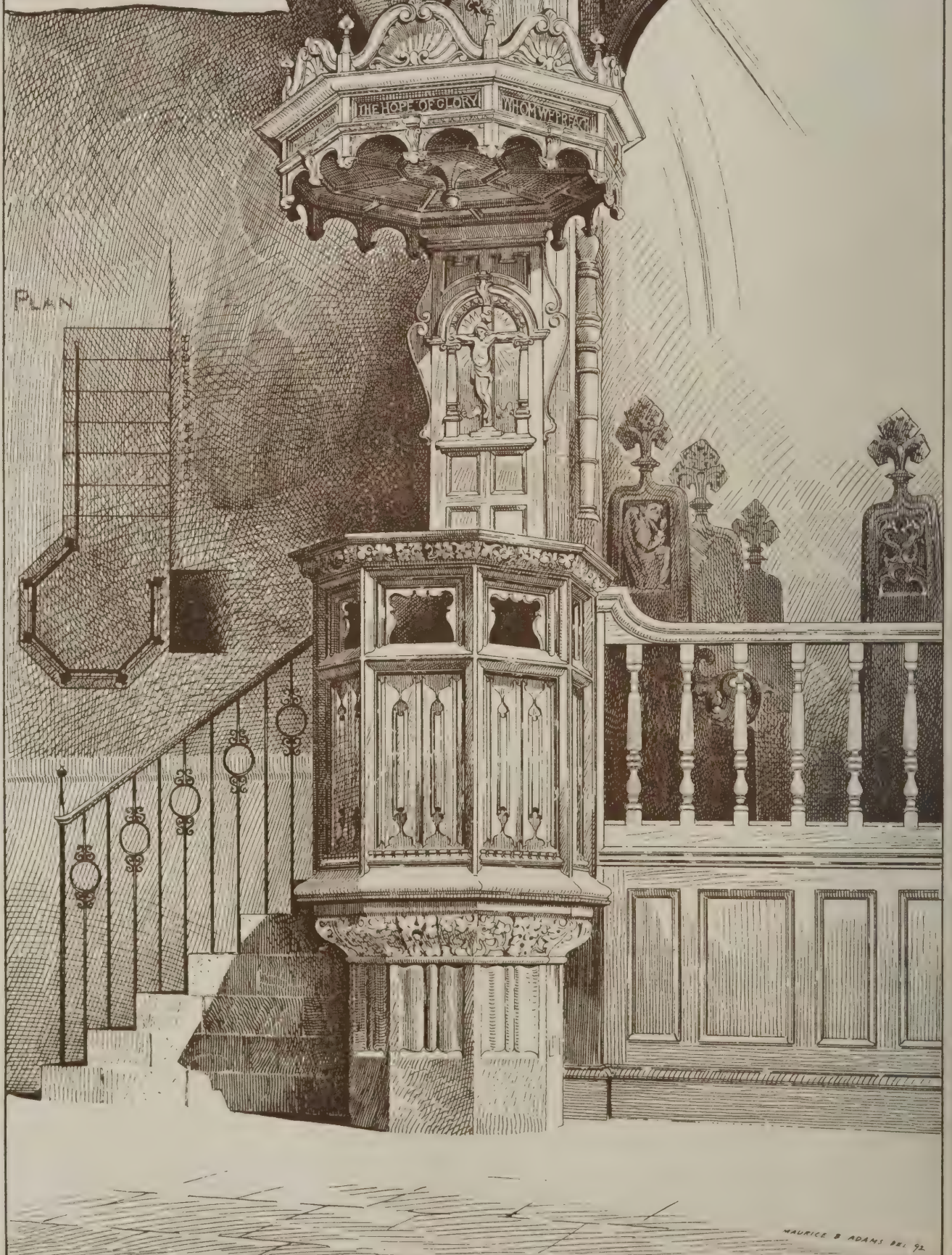
ANGELS BEDFORD PARK

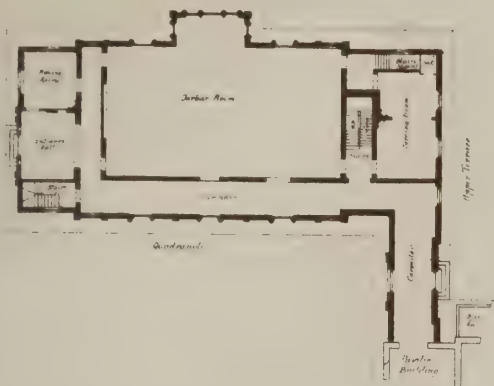
MAURICE B. ADAMS

F.R.I.B.A.

ARCHITECT

CHISWICK





SIDE TOWARDS QUADRANGLE.

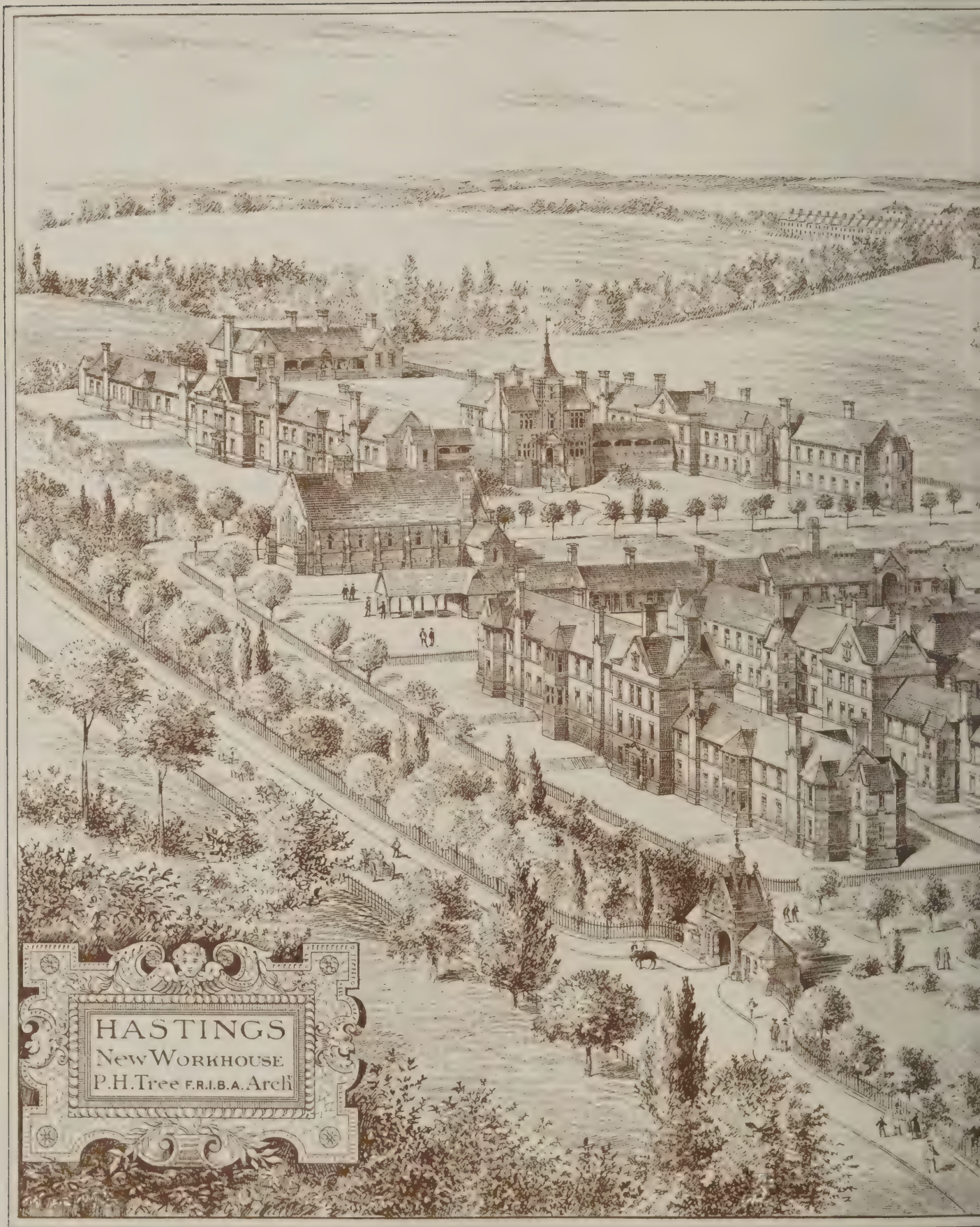


NEW WING, OSBORNE HOUSE, ISLE OF WIGHT.

VIEW FROM THE LAWN.



"PHOTO-TINT," by James Akerman, 6, Queen Square, London, W.C.



Engraved & Printed by James Alcock, 6, Queen Square, W.C.

S. SEP. 16, 1892.

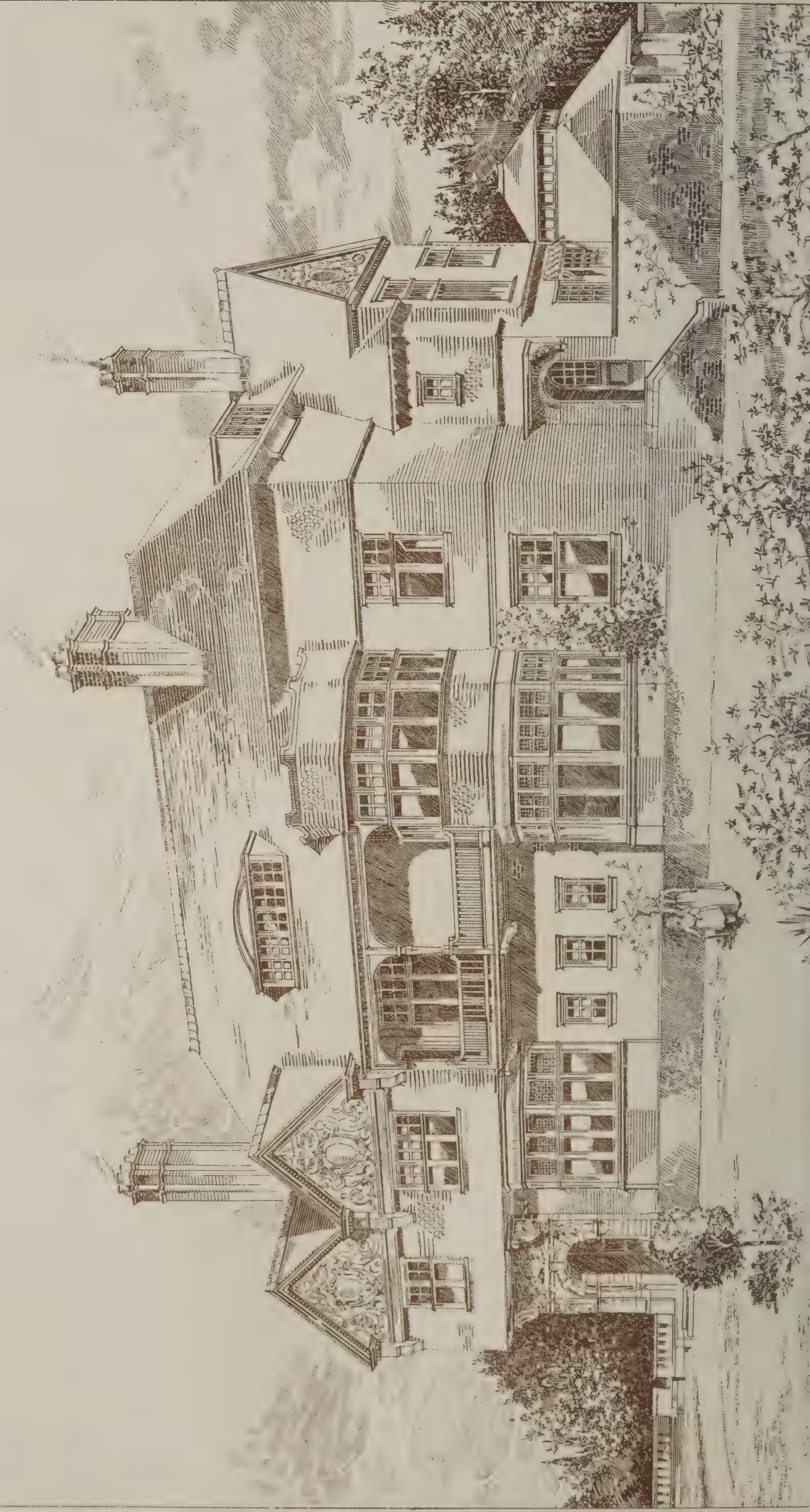


MAURICE B. ADAMS DEL.

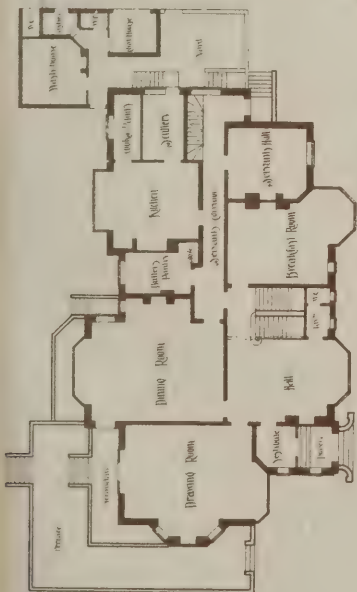
THE BUILDING DONE SEP. 10, 1892.

HOUSE AT BIRKDALE FRANK W. MEE ARCHT

THE ENTRANCE FRONT



THE GARDEN FRONT



(Ground Plan)



THE BUILDING DEWS. SEP. 16, 1892.





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THE ART OF INCONSPICUOUSNESS.

"WILL not this part of the elevation look very plain?" is the common question of a client. "I hope so," would be the appropriate reply of his architect, if, after sufficient study, he has adjusted, as he wished, the various elements of his design. The tiro and the amateur take it for granted that every square yard of a building should have something ornamental about it. The artist knows better. He understands the value of contrast. His music is not all *fortissimo*; his picture is not all in high light; his elevations are not all covered with mouldings and tracery and carving. His triumph lies in getting the greatest effect with the least apparent effort, and to accomplish this the subordinate parts of his work must be quiet and subdued. "Put in plenty of plain wall" was a favourite maxim of the late Mr. Burges. It is a very safe one; but the difficulty lies in following it. A church, indeed, can easily be designed with great unbroken surfaces, but not so easily a house. More air, more light, are the things which sanitary authorities are always demanding, especially in our towns, and they are things which it is difficult to obtain if we keep as much blank wall as would artistically be best.

The architect lives in a world where beauty and use are always at war. It is his work to reconcile them. Even the insides and outsides of his buildings are commonly at variance, so that whatever suits the first spoils the second. Nothing ever comes right for him, everything has to be made right by care and thought and happy inspirations. As an artist he would like his walls to be solid and unbroken below, light and full of aperture above. As a practical planner he has to make them just the reverse. He finds the basement and the ground floor greatly in want of light—at least in town buildings. Higher up fewer windows and smaller ones are needed, and possibly the top story, being lighted from above, needs none at all. Architecturally, this is an upside-down arrangement; practically, it is often an inevitable one. What is the designer to do?

One thing he could do is to accept the necessity, to emphasise the sort of design it naturally points to, and to treat its details in an artistic spirit. If he cannot get the arrangement he likes, he may try to like the arrangement he gets, and to make other people like it too. This is what the builders of the Ducal Palace of Venice attempted with some success. The lower part, as every architect knows, is nothing but a great traceried arcade, without so much as a buttress or a pilaster. So open is it, that, for want of abutment, its arches would not stand an hour except for the tie-bars which hold them in. It is the very extreme of lightness, not disguised, but even made more prominent by the artifices of ornamental art. Over this comes a great flat, unbroken, almost unpierced wall, and then the low-pitched roof. The wall is covered with a kind of gigantic diaper pattern in marble slabs, and the windows are, or were, divided by light arcade shafts. But beyond all question, the plain and subdued part of the elevation is the upper half; while the enriched and emphasised part is unmistakably the lower one. According to ordinary notions, it is a topsy-turvy design. It is rich where we should have made it plain, and plain where we should have made it rich.

Yet it is highly attractive; and the attraction is not wholly owing to the beauty of its detail. The contrast between its arcaded stage and its unrelieved wall is most effective, although, for perfect success, their positions should have been reversed. It is a lovely picture, even if it is a picture hung the wrong way up.

In Mr. Street's book on Spain there is a striking sketch of the exactly opposite arrangement. A plain, solid wall of squared masonry rises to a great height with hardly any break or relief; then, planted on it, and slightly overhanging, is a story of the richest and most elaborate Gothic. Here we get the same sort of contrast as at the Ducal Palace, with the satisfactory feeling in addition that the contrasting halves are rightly placed. The inconspicuous piece of the design here is the lower one; and so, if it could be managed, we should usually wish it to be. The Spaniards were fond of these contrasts, and have left us Renaissance examples of them as well as Gothic ones. They used them, too, in the interiors as well as the exteriors of their public buildings. In the castle of Saragossa, for instance, there is an interior with walls quite plain for most of their height; then suddenly comes a deep, projecting cornice of extreme richness. This carries a beautifully light-traceried arcade or screen, with a smaller but much-decorated cornice above it, while the whole is crowned by a very effective wooden-coffered ceiling. The climate of Spain, with its brilliant sunshine, lent itself easily to such effects as these. There was no difficulty there in getting plenty of plain surface, because the windows could be few and small. But, how are we to get it in England? How are we to manage the art of inconspicuousness? It is one of our most pressing questions, and one of our most puzzling ones. Yet, for fifty people who write and speak on the way of decorating things, hardly one writes or speaks on the way of subduing them. We all know how to make features prominent; or, if we do not, innumerable persons are ready to tell us. But who has yet told us much about the way to keep features in the background?

The windows that come where the architects do not want them are not the only things he would be glad to hide. Doorways at times are equally obtrusive. Public buildings in modern times need an abundance of exits; and it may happen that these cut up the base of an elevation even more than the windows do. Here, again, the two opposite ways of dealing with such difficulties present themselves. We may make the doorways as beautiful and as rich as possible; we may allow them in this way to be their own justification; and we may let the design, as a whole, take its chance. This is what the Mediæval architects of France did in the case of such magnificent portals as those of Rheims and Amiens, and Chartres. Taken by themselves, they are the grandest things of the kind which the world has seen; taken as part of the general design, they are a mistake. We shall not use them as a precedent, if it is the building as a whole that we are thinking of. We shall be more inclined, by one means or another, to keep the doorways inconspicuous, so that the elevation may grow richer as it rises, and so that the eye may be attracted to its summit rather than its base. This was very cleverly managed—some people might say too cleverly—in a design for Victoria Cathedral, which we illustrated about three months ago. Here, in the drawings marked "New and Old," the western doorways were set back under a wide, low, segmental arch, so as to be almost lost to sight. Possibly inconspicuousness in this case went rather too far, but there is no doubt about the value it gave to the elaborate detail above.

Chimneys, like doors and windows, very often come where they are least wished for. They are not quite so obstinate, however, in

their demands, and generally offer a choice of positions. But in certain classes of work, custom and association demand that no chimneys should appear. For a climate like this the demand is absurd. Yet it must be owned that chimneys do not look well in pure Classic buildings, and that the more inconspicuous they are in such cases the better. Naturally, it will not do to keep them down too much. Practical necessities must be remembered, or the chimney which has been unduly humbled will revenge itself by sending up a crop of metal zigzags and corkscrews. It does not seem to be thought proper that a church should have a chimney. A poor, spiritless structure of the kind does sometimes rise up from the vestry roof; but it has the air of asking pardon from all the world for its existence. It tries to be inconspicuous, and is not—which is one of the worst faults that an architectural detail can commit.

Science is constantly sending us new problems to deal with: and it is a question in each case whether the solution is to be of the conspicuous or the inconspicuous class. Unfortunately, there is a tendency to leave the question unanswered. Ventilating pipes, for instance, have to be taken up from the drains. They cannot be beautified, but they might be concealed. Commonly, however, they are simply exhibited in their native ugliness, an offence both to the eye and the imagination, even in designs which aim at being artistic. The same may be said about sanitary work in general. A small part of it might be made presentable: the greater part of it might be made inconspicuous; but too often it is neither the one nor the other. We need not give more examples. The realm of the inconspicuous runs through the whole of art. Everywhere there is something to be kept in the background that there may be more force in the foreground, or some discordant necessity to be kept in decent obscurity. There is no art without contrast; and contrast needs the inconspicuous on one hand just as much as it needs the impressive on the other. It is the last that gets all the praise, but it may be the first that has taken most of the skill.

BAD HOUSE-DRAINAGE.

DURING a time of threatening epidemics it is very necessary for sanitary authorities to use all the safeguards they can to prevent the flooding of houses in low-lying districts, which are numerous in the Metropolis. Only lately the Battersea Vestry have had brought to their notice the recent inundation of some 500 houses during the very heavy fall of rain in August last, and the existence of many hundreds of houses the basements of which are below the level of the drains, or are so badly provided that when a storm takes place the basement floors are flooded. Other localities at Clapham, Fulham, Putney, Kennington are equally subjected to the inconveniences arising from building below a safe level, or so close to it as to impede the free discharge of storm-waters. Yet, although these localities yearly suffer from floods, houses continue to be built on land frequently saturated with water, the drains introduced being merely subterfuges which only carry away the surface-water in dry weather. In several new estates we find cellars excavated which are full of soakage water. When it has partly percolated the surrounding soil or evaporated, the walls are carried up, the house is covered in and let, and the inmates are none the wiser that their fires are really drawing into the house vapours of the most obnoxious kind. The drains put in merely lower the water-level to a few inches below the basement during dry weather; but immediately a heavy rainfall occurs, the basement is found to

be again under water. At Battersea, for example, it is well known there are hundreds of houses which have their basement floors level with and below the invert of local sewers. How can those houses ever remain free from floods? Mr. John Burns, M.P., in a letter to the Battersea Vestry, reminds them of this condition of things, and that many of the connections between houses and local sewers are very imperfect; the pipe sewers are too small, and should be made into brick sewers. Many of the brick sewers are equally inadequate, and can only be cleansed by the chain and rod process. The desirability of enlarging the connecting and local drains we have lately advocated as one of the means for remedying the frequent surcharge of flood-water and preventing the "back-watering" of houses having insufficient fall to the sewers. Mr. Burns, in his letter, says, "I think further that the practice of having a chamber 10 or 14 ft. from the main sewer, with flap on inlet to chamber is not as good as continuing the local sewer into the main one, with flap on point of junction with it. Altogether, there is insufficient pond room, and also insufficient access to pumping station and main sewer by the local drains. This is proved by the fact that the recent rain-storm commenced at 5 a.m.; at 5.15 floods took place in Ingrave-street, whilst at the pumping station there was not enough water with which to commence pumping until 6 a.m. From investigation, I find that many of the houses were flooded before it was necessary or possible to start the pumps through lack of water in the "sump"—i.e., at 6 o'clock, and when the main sewer at the pumping station was full at 8.30, the water had subsided from local floodings. This is also confirmed by the fact that floods have occurred when there has been no need to pump, and with a sewer only half-full. This means that either choking takes place, or that local connecting sewers with the main sewer of York-road are inadequate." If these facts are as stated, it is clear evidence that the fault lies in the connecting drains between the houses and main sewers; it proves, in short, that the connections are either much too small or are laid too level, or are choked and do not discharge their contents. The whole of the levels require readjustment. We have no satisfactory proof that this state of things does not exist in other parts of London subject to floods. The local pipe sewer is no longer capable of carrying away the flood in many instances, or the intercepting chamber referred to by Mr. Burns is not low enough or becomes over-charged with surface-water before the main sewers are in operation or running full. The consequence of which is that the house-drains become speedily overcharged, and as they cannot discharge at the sewer end fast enough, their contents are driven backward into the houses. Again, when it is stated that many houses are flooded before it is possible to start the pumps, we may be sure the "sumps" or wells at the pumping stations are not properly connected with the local drains, or their level must be above that of the basements. We should be inclined to think the former is the case. Under the present system of sanitary inspection it would seem preposterous to entertain the opinion that house-drains are often mere disguises, and are never properly connected with the sewers; but these statements appear to confirm the suspicion, because if hundreds of houses are flooded before the sewers are running full, it proves something radically wrong with the connection.

Other grievances have been reported equally prejudicial to the health of districts, such as the "percolation of land water into bakehouses, public-house cellars, and basements." Mr. Burns mentions the fact that several public-houses and bakehouses were

subjected to the percolation of clean water through the walls of their cellars, which was of frequent occurrence. Much of the water comes up through gullies contaminated with sewage, as in the case of a bakehouse. Of course, the mischief may arise from the same cause—viz., the want of capacity or discharge of the drains to carry away the storm or land water; but in some instances the back yards and areas are without any means of drainage, there being no gully-gratings. The water not finding escape, enters the sunken areas round the house, and percolates through the walls into the basements, or saturates the spaces beneath ground-floor rooms, much to the detriment of health. We have before urged the necessity of a rule or by-law to compel owners to construct concrete or asphalt basements, and Mr. Burns suggests that owners of basements lower than they should be ought to be made to abandon them or concrete them. The whole question of the re-drainage of our large and rapidly increasing districts is one that must before long be considered. Vestries are locally responsible, but the London County Council must take the initiative step in reconstructing the present system, which is already inadequate to meet the growth of large building areas.

WORKING DRAWINGS AND SPECIFICATIONS.

NOTHING is more troublesome, not to say repulsive, to the young artistic aspirant whose prospect of professional achievement looks fair and easy than to have to descend from the cloudland of the imagination to the office labour of making a working drawing or writing a specification. The thing is essentially repugnant to him. From fancy to fact the descent is not at any time easy or agreeable. To sketch an impression on paper, say of some stone detail or a piece of woodwork, may be bewitchingly alluring; but to come to analyse one's thoughts and reduce them to a matter of stone-cutting and joggles and cramps, or of framing and jointing, is to allow all the poetry and charm to evaporate in the process. The enchantment is gone—the spell broken. Just imagine for a moment a poet or a painter taking to pieces his composition, or an architect who had designed a beautiful *flèche* having to sit down and see how such a structure can be erected of timber and iron and lead, to calculate its weight, and to consider it as a skeleton of timber or iron. The mind which had conceived the thought or image in its abstract beauty of completeness coolly and deliberately looking upon it from a logician's or a mechanic's point of view! We might as well expect a painter of landscape to explain how the yonder ruin or cottage in his composition was planned, or for him to give us the working perspective lines or the anatomy of his figures. As reasonably we might ask the poet to prove the grammatical correctness of his verse. Critical accuracy is not looked for in artistic creations. The analytical process is, notwithstanding, necessary to the architect according to our modern notions of his duties, though, as M. Cesar Daly says, the poetical side of architecture is too neglected. The public do not think so, and often with a will that shocks the high-art notions of some, when they call upon the architect to become an expert sanitary engineer, to know all about drains and hot-water apparatus, and to do sundry things that are more in the way of the plumber and bricklayer.

To take, for example, working drawings. These imply a variety of technical requirements that can only be learned in the workshop or on the building. Is it not a fact that a large proportion of such details are

undertaken by the clerk of works in large works, and that these are passed by the architect? We are quite ready to admit that an able clerk of works, with the measurements and materials, and actual requirements at his fingers' ends, is more able to make a practicable detail drawing for the mason, or bricklayer, or carpenter, than the architect who may be miles away from the building, and ignorant of the actual conditions; and we are prepared to say the practice is more in accord with the ancient traditions of architecture than the modern one of some assistant preparing a working drawing from the small-scale contract drawings under the general directions of his employer. We know from experience what the assistant often turns out from such crude data. If it is the working detail of a brick arch or window, it is seriously defective. The "bond" has not been observed, the courses have been set out wrongly, the moulded part of jamb or arch cannot be worked with the moulded bricks on the building, or the dimensions may be found to be altogether "out." It cannot be expected that an assistant or pupil to a busy architect has the practical knowledge to enable him to set out "bond," as, for example, the mullions of a bay window, or will take the trouble of obtaining exact dimensions from the actual work. The drawing is merely an enlargement of the $\frac{1}{4}$ in. scale drawings. Much less can he prepare "full-size" drawings of any such detail. But the clerk of works on the building can obtain the exact requirements of the bricklayer or mason. It may be said the architect ought to prepare his own details. Certainly he should, if possible; he visits the work in progress, and can see exactly the requirements; he knows what he wants, and can give his own instructions. But how many really can do this in large buildings?—and, we may add, are they all such practical men—masters of the trades they profess to direct? These are questions which are becoming more urgent. Competition and technical education have been disuniting the profession and the trade, making the gulf between them wider. The architect in full practice finds his hands full in making negotiations, attending clients and committees, competing for large buildings, without attending to details of works in progress, though we know, according to the old *régime*, he paid as much attention to the details of his building as he did in its design. Running after commissions and competing did not then enter into the duties of the architect.

The clerk of works has his own duties and obligations to discharge, and to require him to make working drawings would be to impose on him a labour in addition to his already onerous duties. Further than this, his responsibilities as local superintendent of the work would militate against such employment. He could not act with the same independence as he does when he has to enforce the execution of the architect's details if he had himself to prepare them. A suspicion of connivance between him and the contractor might arise. Yet, for all this, he is in the most advantageous position for knowing exactly what is wanted if the architect could imbue him with his artistic spirit. Of many of the constructive details he is master; the early training of a clerk of works, often having fulfilled the position of builders' foreman, or coming from the ranks of working joiners, masons, or bricklayers fits him for the duty; but then the unhappy estrangement between what is artistic and what is practical, makes it impossible that any architectural details should be intrusted to his hand. Hence the present arrangement of all drawings being prepared in the architect's office, though it may be urged that many of those are necessarily modified, altered, or redrawn by the clerk of works before they can be executed.

The working drawing has not yet been made a subject of study amongst the younger men of the profession, who have regarded it with the same aversion as they would in taking up an advanced course of mathematics. There is too much of the "smell" of the workshop about it: it means an acquaintance with materials, market sizes, thickness of stuff, and trade methods, which things are unpalatable to the tastes of artistic draughtsmen. The course of study begun at the Association may do something to encourage the study as a special branch, though we have no very strong belief that anything but personal interest in the technics of the profession will ever make an office-trained architect a skilful artist in wood or masonry or any other material. The technical school and workshop may instruct in the use of tools and manual processes, but will never make a designer of details—that implies power of seeing, or of conceiving, as well as technical knowledge of cutting stone, or moulding brick, jointing, &c. We find a clever joiner unable even to draw on paper what his work will look like—his mouldings are execrable, his profiles clumsy or commonplace—one reason why a clerk of works, brought up as a carpenter, makes a poor designer of details, and can very seldom turn out a decent drawing of any detail for a mason or bricklayer. The more general knowledge of the architect enables him to take a better proportioned view of the trades; his wider acquaintance with old examples and details, and his artistic knowledge are advantages which the operative has not—one reason why an architect's detail has more general feeling with the design than one prepared by a craftsman, though it is defective in technical knowledge. The two things can only be acquired by the architectural student drawing his details in the building or in the workshop.

Then we have the tiresome specification, which, if anything, is worse and more repulsive than the detail. Ordinary clauses we may suppose are understood by, and present little difficulty to, the architect; but specifications of new inventions and manufactures are a source of trouble, and are yearly becoming more irksome. The question generally is not so much what to specify, but how to specify. It will not do to place oneself unreservedly into the hands of some enterprising firm who may be thoroughly honest, and yet desirous of making a good bargain. An architect who simply goes to the manufacturer and tells him what he wants done, but does not make any reservations or any conditions, must not wonder if he finds himself in a rather awkward position sometimes, unable to compel compliance to his requirements. But the fact is that the manufacturer has the advantage. The architect knows nothing of the manufacture—it may be a patented system of flooring, or a new plaster or paint which has been found of value, and he is inclined to place himself unreservedly in the patentee's hands. Only the manufacturer can give the information or directions for its use or fixing, and therefore if a specification has to be written it can only be done by him. The architect writes for information, which being supplied, a clause is introduced into the specification that is very inadequate. The better way is, of course, to enter into an agreement with the manufacturer—a correspondence between the parties constituting sometimes a contract—binding the manufacturer to supply the materials and execute the labour necessary, the whole to be done to the satisfaction of the architect. Unfortunately, the latter has no guarantee that the work will be done to his satisfaction. Thus we may imagine that a certain depth of iron joist is specified, but which is found to be insufficient to make a rigid floor, or that two coats of a certain paint, the agreed

allowance, has been found not to produce the desired effect. An additional column or two may be required, or a third coat of paint, and of course in either case it is an "extra." The manufacturer has overrated his goods, or underrated the requirements of the architect—these things follow as a matter of course. It is a common thing to overstate the virtues of a new invention or material, and it is, therefore, all the more necessary that the architect should be on his guard in discovering, if he can, by independent evidence, or from others who have used the said invention or material, the actual advantages claimed for it. Specifications of all new things should, therefore, be prepared with some caution, and probably the best way to meet the difficulty in some instances is to allow the manufacturer to write a specification that shall cover all risks, binding himself to perform the work to the requirements of the architect or his employer.

IRON ARCHES OF LARGE SPAN.—I.

CAST IRON.

IF we compare the earlier examples of cast-iron arches with structures similar in principle of design and description of material belonging to a more modern date, we shall find that there does not exist between them that extreme discrepancy in relative proportions which characterises bridges of wrought iron under the same conditions. The first iron bridge erected in this country was over the river Severn, near to Coalbrook Dale, whence it derived its name. It was a cast-iron arched-rib structure, having a clear span of 100ft., and was constructed more than a century ago. The largest cast-iron arch in the world is still the centre arch of old Southwark Bridge, with a span of 240ft. Taking the span of Coalbrook Dale Bridge as the datum or starting point, it is evident that succeeding examples of cast-iron arches have surpassed their predecessors with respect to that dimension, in the proportion of $2\frac{1}{2}$ to 1 nearly.

In the case of wrought-iron bridges, the ratio between ancient—if we may use the term—and modern constructions, in regard to span, has a far wider limit. Assuming the initial span of the wrought-iron prototype to be the same as that of the cast iron, namely, 100ft., the latest and greatest triumph of bridge-building, in this or any other country, exceeds this modest dimension by about seventeen and a half to one. From this comparison bridges on the suspension principle may be fairly excluded, as, with one or two exceptions, they were very early constructed of spans which are considered "large" at the present day. It will thus be seen that whilst the cast-iron arch and wrought-iron suspension principles sprang, as it were, into nearly full maturity, the horizontal girder principle passed through a protracted, and sometimes perilous, period of infancy and growth. The reasons for this sudden development of these two particular types of bridge construction, are to be found:—First, in the fact that cast and wrought iron exert, individually, a powerful resistance against strains of a distinctly opposite nature. Secondly, although the knowledge of the capabilities of these two materials, and their ultimate behaviour under severe loads, were at that time but very imperfect, yet engineers had both the ability and judgment to utilise their respective constructive values to the best advantage. The proper form in which to design cast and wrought iron beams and girders was still undergoing the process of testing and experiment, and a correct result was not arrived at until the part played by the "inertia" of the section, with respect to its strength, was recognised as a most important feature in the calculation of its resistance.

We shall thus be prepared to find as we proceed with our subject that the form of the cross-sectional areas of the arch-ribs employed in the earlier examples of cast-iron arches do not comply in this particular with the dictates of mathematical theory. This will be pointed out when treating of the "moment of inertia" of differently shaped sections.

It must be admitted that cast-iron in the form of an arch-rib possesses many and strong claims upon the consideration of engineers, and these claims had additional weight at a time when its comparative weakness under a heavy live weight,

or impactive force, was not very well known, or, if known, frequently neglected or ignored. The metal itself was cheap, could be used *en bloc* without the necessity of accompanying angle, tee, channel, or other separate sections of iron, and the usual large amount of riveting which constitutes the inevitable adjunct of ordinary wrought-iron bridge and girder work. Again, its great resistance to strains of a compressive character, amounting as a maximum to 50 tons per square inch of sectional area, rendered it peculiarly well adapted to the arch type of bridge, since the strains upon an arch-rib are wholly of that description. Under these conditions no call is made upon the tensile strength of the same material, which amounts, per same unit of area, to barely one-sixth of its resistance to compression. The chief advantage of applying cast iron in the especial form under notice is that the resulting strains being of one description only permit of an equal or symmetrical distribution of material about the central axis of the rib, and this highly favourable condition obtains whether the rib is formed with upper and lower flanges, or without them. The ribs of the early specimens of cast-iron arches were without flanges, and resembled in form a deep plank set on edge; and it can be easily shown that in this instance the neutral axis passes through the centre of the cross section of the plank. A practical example will demonstrate this more satisfactorily. In Fig. 1 is shown a cross section of one of the ribs of the Chepstow Bridge over the river Wye. There are five cast-iron arches in the whole structure, the centre arch having a span of 112ft. There is a small top flange to the ribs; but as it is intended solely for bolting the ribs to the spandrel standards, and is, moreover, of very insignificant dimensions, it cannot be included in the sectional area of the rib for any purposes of calculation. In the rectangular section C D in Fig. 1, let b

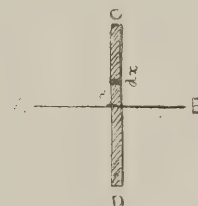


FIG. 1.

equal the breadth, and dx the depth of any very thin layer, supposed to be parallel to the neutral axis A B, and situated at a distance from it represented by x . Then the area of this layer will be equal to $b dx$, and multiplying this quantity by the square of the distance from A B, we obtain for its moment of inertia, calling the latter term I, the expression $I = b x^2 dx$. Considering at present only one half of the rectangular section, or that part of the section above the line A B, it is clear that if successive layers of it were taken, and each layer multiplied by x^2 , the sum of all the layers so treated would be equal to the moment of inertia of the whole half-section. Expressing this summation or integration by the usual symbol, and putting I for the moment of inertia, we have for the plank

$$I = \int b x^2 dx.$$

Since the section is uniformly and symmetrically distributed about the line A B, and the moments about it are also equal, that line represents the neutral axis, and is at the centre of the cross-section. By similar reasoning, the moment of inertia of the lower half of the section will be equal to that of the upper, so that in this instance, if I equals this total amount, we have—

$$I = 2 \int_0^{\frac{d}{2}} b x^2 dx,$$

from which, by integrating—

$$I = \frac{2 b x^3}{3}.$$

Taking the limits of x between $\frac{d}{2}$, where d = the total depth of the section and $x = 0$ at the centre, we finally obtain—

$$I = \frac{b d^3}{12},$$

which is a general form of expression for both

solid rectangular sections and flanged girders, provided that in the latter the same conditions of the uniform distribution of the material is insured.

In the formula—

$$I = 2b \int x^2 dx,$$

when applied to sections in which the material is not uniformly distributed about the axis, the term b will vary with the distance x , and must be expressed accordingly. The expression of I for triangular and other unsymmetrically shaped sections will furnish examples of such substitutions. In all the equations and formulæ relating to the value of I , the importance of the factor d , or depth, of the section with respect to its resistance to strain, is apparent. If for bd^3 , the numerator of the fraction giving the equation for I , we write ad^3 , we obtain the result in terms of the area. If, again, we make d equal to unity, we obtain $I = \frac{b}{12}$. As already pointed out, the

value of b was hardly recognised in the earlier forms of arched-rib sections, any more than it was in the primitive examples of ordinary cast-iron beams; and it was not until both theory and experiment demonstrated its importance that its value became properly appreciated. It is evident, therefore, that it does not necessarily follow that any given value for d will produce the best section. On the contrary, a better form of section may be produced, when both the depth and area are constant, by a simple different distribution of the material with regard to the value of x . In some instances, moreover, the original dimension of d may be diminished with advantage.

In future practical illustrations we shall not consider any cast-iron arch with a less span than 150ft. as coming within the scope of our subject. In small examples of construction there is not that demand or regard for scientific design which becomes imperative when the work attains to a character of some magnitude.

PRICES.*—XLVII.

(All Trade Discounts have been taken off, and Profit added.)

IRONMONGER (continued).

BRASS DRAWER PULLS, fixed—		£	s.	d.
3in. plain brass, dead	each	0	0	4
" " polished	ditto	0	0	5
3½ ditto dead	ditto	0	0	6
" " polished	ditto	0	0	7
2½in. shell design ditto	ditto	0	0	5
3 ditto ditto	ditto	0	0	6
3½ ditto ditto	ditto	0	0	7½
Drop handles or stamped plates	ditto	0	1	0
" large ditto	ditto	0	1	3
" cast ditto	ditto	0	2	0
2in. ordinary brass drop handles with loose end plates and shouldered stop	ditto	0	0	4
2½ ditto ditto ditto	ditto	0	1	4½
2½ ditto ditto ditto	ditto	0	0	5
3 ditto ditto ditto	ditto	0	0	6½
3½ ditto ditto ditto	ditto	0	0	7
3½ ditto ditto ditto	ditto	0	0	8
3½ ditto ditto ditto	ditto	0	0	9
4 ditto ditto ditto	ditto	0	0	10½
4½ ditto ditto ditto	ditto	0	1	1
5 ditto ditto ditto	ditto	0	1	4½
2 ditto ditto ditto strong	ditto	0	0	6
2½ ditto ditto ditto	ditto	0	0	6½
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2½ ditto ditto ditto	ditto	0	0	7½
3 ditto ditto ditto	ditto	0	0	8½
3½ ditto ditto ditto	ditto	0	0	10
3½ ditto ditto ditto	ditto	0	0	11
3½ ditto ditto ditto	ditto	0	1	1
4 ditto ditto ditto	ditto	0	1	3
4½ ditto ditto ditto	ditto	0	1	5
5 ditto ditto ditto	ditto	0	1	9
BRASS FLUSH HANDLES, fixed—		£	s.	d.
2½in. cast handles, stamped frames	ditto	0	0	9
2½ ditto ditto ditto	ditto	0	0	9½
3 ditto ditto ditto	ditto	0	0	10
3½ ditto ditto ditto	ditto	0	0	10½
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1½ ditto ditto ditto strong	ditto	0	0	8½
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4 ditto ditto ditto	ditto	0	1	5
4½ ditto ditto ditto	ditto	0	1	7
4½ ditto ditto ditto	ditto	0	1	9

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4½in., very strong, with cast plates, and polished—		£	s.	d.
5 ditto ditto ditto	each	0	2	2
5½ ditto ditto ditto	ditto	0	2	7
6 ditto ditto ditto	ditto	0	3	2
6 ditto ditto ditto	ditto	0	3	9
MEDIEVAL DROP HANDLES, fixed—		£	s.	d.
1½in. brass, strong	ditto	0	1	2
1½ ditto ditto	ditto	0	1	4
2 ditto ditto	ditto	0	1	6
1½ ditto with bold rose stamped with design	ditto	0	0	10
1½ ditto ditto	ditto	0	1	0
MEDIEVAL ESCUTCHEONS, fixed—		£	s.	d.
Small brass	ditto	0	0	2
Large ditto	ditto	0	0	4
Extra ditto	ditto	0	0	5
PLAIN ESCUTCHEONS, fixed—		£	s.	d.
Small thread escutcheons	ditto	0	0	1½
Large ditto	ditto	0	0	2
1in. stamped plate escutcheons	ditto	0	0	3
1½ ditto ditto	ditto	0	0	4
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1½ ditto ditto	ditto	0	0	94
1½ ditto ditto	ditto	0	0	95
1½ ditto ditto	ditto	0	0	96
1½ ditto ditto	ditto	0	0	97
1½ ditto ditto	ditto	0	0	98
1½ ditto ditto	ditto	0	0	99
1½ ditto ditto	ditto	0	0	100

CUPEBOARD KNOBS, fixed—			BRASS SCREW COLLARS OR CAPS, fixed—			BALANCE WEIGHTS, &c., for Ventilators—		
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1in. ornamental brass	each	0 0 5	For No. 4 to No. 7 gauge screws, machine	each	0 0 0	A 1 1 1/2in. by 5 1/2in.	each	0 0 4 1/2
1 1/2 ditto ditto	ditto	0 0 6	made	ditto	0 0 0	11 by 8	ditto	0 0 5
1 3/4 ditto ditto	ditto	0 0 7	8 9 10 ditto ditto	ditto	0 0 0	16 by 8	ditto	0 0 6
2in. ditto ditto	ditto	0 0 9	11 12 14 ditto ditto	ditto	0 0 0	White and gold ditto 10d., 1s 2 1/2d. and 1s 4 1/2d. Leading		
2 1/2 ditto ditto	ditto	0 0 3	7 8 9 ditto east brass	ditto	0 0 0	pulleys, 5d. each. Flexible cord for all sizes. White		
2 3/4 ditto ditto	ditto	0 0 3 1/2	10 11 12 ditto ditto	ditto	0 0 0	silk, 6d. per yard; large silk, 7d. per yard.		
3 ditto ditto	ditto	0 0 2 1/2	No. 14 ditto ditto	ditto	0 0 1			
3 1/2 ditto ditto	ditto	0 0 2 1/2						
3 3/4 ditto ditto	ditto	0 0 3	SASH CENTRES, unfixed, the price of fixing being included					
4 ditto ditto	ditto	0 0 3 1/2	with the sashes—	£	s. d.			
4 1/2 ditto ditto	ditto	0 0 3 1/2	2 by 1/2 japanned centres	per set	0 0 2	ARNOTT'S VENTILATORS, unfixed—		
4 3/4 ditto ditto	ditto	0 0 3 1/2	2 1/2 by 1/2 ditto ditto	ditto	0 0 2 1/2	9 by 3 1/2 plain iron ventilators	each	0 4 6
5 ditto ditto	ditto	0 0 3 1/2	2 1/2 by 1 ditto ditto	ditto	0 0 2 1/2	11 by 8 ditto ditto	ditto	0 5 6
5 1/2 ditto ditto	ditto	0 0 3 1/2	2 1/2 by 1 1/2 ditto ditto	ditto	0 0 2 1/2	16 by 9 ditto ditto	ditto	0 9 6
5 3/4 ditto ditto	ditto	0 0 4	3 by 1 1/2 ditto ditto	ditto	0 0 3	12 by 8 1/2 ditto ditto	ditto	0 7 0
6 ditto ditto	ditto	0 0 4 1/2	2 by 1/2 brass ditto ditto	ditto	0 0 5	16 by 10 1/2 ditto ditto	ditto	0 9 9
6 1/2 ditto ditto	ditto	0 0 4 1/2	2 1/2 by 1 ditto ditto	ditto	0 0 6	10 by 6 ditto ditto	ditto	0 4 9
6 3/4 ditto ditto	ditto	0 0 4 1/2	2 1/2 by 1 1/2 ditto ditto	ditto	0 0 6	11 by 8 White and gold ditto	ditto	0 8 0
7 ditto ditto	ditto	0 0 4 1/2	3 by 1 ditto ditto	ditto	0 0 10 1/2	16 by 9 ditto ditto	ditto	0 12 6
7 1/2 ditto ditto	ditto	0 0 4 1/2	3 1/2 by 1 1/2 ditto ditto	ditto	0 0 11	12 by 8 1/2 ditto ditto	ditto	0 10 0
7 3/4 ditto ditto	ditto	0 0 4 1/2				16 by 10 1/2 ditto ditto	ditto	0 14 9
8 ditto ditto	ditto	0 0 4 1/2	The set is two pieces. Four pieces are required for			10 by 6 ditto ditto	ditto	0 8 0
8 1/2 ditto ditto	ditto	0 0 4 1/2	each sash.			9 by 3 brass fronts ditto	ditto	0 8 0
8 3/4 ditto ditto	ditto	0 0 4 1/2				11 by 8 ditto ditto	ditto	0 17 6
9 ditto ditto	ditto	0 0 4 1/2	STAIR THREADS, fixed in deal—	£	s. d.	16 by 9 ditto ditto	ditto	1 9 0
9 1/2 ditto ditto	ditto	0 0 4 1/2	2 1/2in. brass chequered	per foot run	0 2 10	11 by 8 galvanised ditto	ditto	0 8 0
9 3/4 ditto ditto	ditto	0 0 4 1/2	3 ditto ditto	ditto	0 3 10	16 by 9 ditto ditto	ditto	0 11 6
10 ditto ditto	ditto	0 0 4 1/2	4 ditto ditto	ditto	0 4 4	Set screws for above	ditto	0 0 5
10 1/2 ditto ditto	ditto	0 0 4 1/2	5 ditto ditto	ditto	0 5 4	Patent rocking cleats found	ditto	0 1 0
10 3/4 ditto ditto	ditto	0 0 4 1/2	6 ditto ditto	ditto	0 6 6			
11 ditto ditto	ditto	0 0 4 1/2	7 ditto ditto	ditto	0 7 6	TUTTLE'S SELF-INDICATING VENTILATORS, black or white		
11 1/2 ditto ditto	ditto	0 0 4 1/2	8 ditto ditto	ditto	0 8 9	japanned, unfixed—		
11 3/4 ditto ditto	ditto	0 0 4 1/2	9 ditto ditto	ditto	0 9 6	6in. by 5in. opening	each	0 6 0
12 ditto ditto	ditto	0 0 4 1/2	10 ditto ditto	ditto	0 1 6	6 by 10 ditto ditto	ditto	0 6 4
12 1/2 ditto ditto	ditto	0 0 4 1/2	11 ditto ditto	ditto	0 2 0	7 by 7 ditto ditto	ditto	0 6 4
12 3/4 ditto ditto	ditto	0 0 4 1/2	12 ditto ditto	ditto	0 2 9	7 by 10 ditto ditto	ditto	0 7 0
13 ditto ditto	ditto	0 0 4 1/2	1 1/2 rolled ditto	ditto	0 2 0	8 by 8 ditto ditto	ditto	0 7 9
13 1/2 ditto ditto	ditto	0 0 4 1/2	2 ditto ditto	ditto	0 2 6	8 by 10 ditto ditto	ditto	0 7 6
13 3/4 ditto ditto	ditto	0 0 4 1/2	2 1/2 ditto ditto	ditto	0 3 0	8 by 12 ditto ditto	ditto	0 10 8
14 ditto ditto	ditto	0 0 4 1/2	3 ditto ditto	ditto	0 3 6	9 by 14 ditto ditto	ditto	0 11 3
14 1/2 ditto ditto	ditto	0 0 4 1/2	3 1/2 ditto ditto	ditto	0 3 6	10 by 10 ditto ditto	ditto	0 9 9
14 3/4 ditto ditto	ditto	0 0 4 1/2	4 ditto ditto	ditto	0 4 0	10 by 12 ditto ditto	ditto	0 11 3
15 ditto ditto	ditto	0 0 4 1/2	4 1/2 ditto ditto	ditto	0 4 6	10 by 14 ditto ditto	ditto	0 12 6
15 1/2 ditto ditto	ditto	0 0 4 1/2	5 ditto ditto	ditto	0 5 2	10 by 16 ditto ditto	ditto	0 14 9
15 3/4 ditto ditto	ditto	0 0 4 1/2	6 ditto ditto	ditto	0 5 8	12 by 12 ditto ditto	ditto	0 15 0
16 ditto ditto	ditto	0 0 4 1/2	7 ditto ditto	ditto	0 6 0	12 by 15 ditto ditto	ditto	0 17 6
16 1/2 ditto ditto	ditto	0 0 4 1/2	8 ditto ditto	ditto	0 6 6	12 by 17 ditto ditto	ditto	0 19 6
16 3/4 ditto ditto	ditto	0 0 4 1/2	9 ditto ditto	ditto	0 7 0	12 by 19 ditto ditto	ditto	1 2 0
17 ditto ditto	ditto	0 0 4 1/2	10 ditto ditto	ditto	0 7 6	14 by 22 ditto ditto	ditto	1 9 0
17 1/2 ditto ditto	ditto	0 0 4 1/2	11 ditto ditto	ditto	0 8 0			
17 3/4 ditto ditto	ditto	0 0 4 1/2	12 ditto ditto	ditto	0 8 6	Wall frames are extra to the above. For 6 by 3, 1s. 8d.;		
18 ditto ditto	ditto	0 0 4 1/2	13 ditto ditto	ditto	0 9 0	6 by 10, 7 by 7, 7 by 10, 8 by 8, 2s. 3d.; 8 by 10, 2s. 6d.;		
18 1/2 ditto ditto	ditto	0 0 4 1/2	14 ditto ditto	ditto	0 10 0	8 by 12, 3s.; 9 by 14, 4s. 3d.; 10 by 10, 4s. 3d.; 10 by 12,		
18 3/4 ditto ditto	ditto	0 0 4 1/2	15 ditto ditto	ditto	0 10 6	4s. 3d.; 10 by 14, 4s. 6d.; 10 by 16, 4s. 6d.; 12 by 12, 4s. 3d.;		
19 ditto ditto	ditto	0 0 4 1/2	16 ditto ditto	ditto	0 11 0	12 by 17, 5s.; 12 by 19, 5s. 6d.; 14 by 22, 7s. 3d.		
19 1/2 ditto ditto	ditto	0 0 4 1/2	17 ditto ditto	ditto	0 11 6			
19 3/4 ditto ditto	ditto	0 0 4 1/2	18 ditto ditto	ditto	0 12 0	6in. by 5in. opening	each	0 7 6
20 ditto ditto	ditto	0 0 4 1/2	19 ditto ditto	ditto	0 12 6	copper, or bronze metal	ditto	0 7 9
20 1/2 ditto ditto	ditto	0 0 4 1/2	20 ditto ditto	ditto	0 13 0	6 by 10 ditto ditto	ditto	0 7 9
20 3/4 ditto ditto	ditto	0 0 4 1/2	21 ditto ditto	ditto	0 13 6	7 by 7 ditto ditto	ditto	0 7 9
21 ditto ditto	ditto	0 0 4 1/2	22 ditto ditto	ditto	0 14 0	7 by 10 ditto ditto	ditto	0 9 0
21 1/2 ditto ditto	ditto	0 0 4 1/2	23 ditto ditto	ditto	0 14 6	8 by 8 ditto ditto	ditto	0 7 6
21 3/4 ditto ditto	ditto	0 0 4 1/2	24 ditto ditto	ditto	0 15 0	8 by 10 ditto ditto	ditto	0 9 6
22 ditto ditto	ditto	0 0 4 1/2	25 ditto ditto	ditto	0 15 6	8 by 12 ditto ditto	ditto	0 10 6
22 1/2 ditto ditto	ditto	0 0 4 1/2	26 ditto ditto	ditto	0 16 0	9 by 12 ditto ditto	ditto	0 12 0
22 3/4 ditto ditto	ditto	0 0 4 1/2	27 ditto ditto	ditto	0 16 6	9 by 14 ditto ditto	ditto	0 13 6
23 ditto ditto	ditto	0 0 4 1/2	28 ditto ditto	ditto	0 17 0	10 by 10 ditto ditto	ditto	0 12 0
23 1/2 ditto ditto	ditto	0 0 4 1/2	29 ditto ditto	ditto	0 17 6	10 by 12 ditto ditto	ditto	0 13 0
23 3/4 ditto ditto	ditto	0 0 4 1/2	30 ditto ditto	ditto	0 18 0	10 by 14 ditto ditto	ditto	0 15 6
24 ditto ditto	ditto	0 0 4 1/2	31 ditto ditto	ditto	0 18 6	10 by 16 ditto ditto	ditto	0 17 0
24 1/2 ditto ditto	ditto	0 0 4 1/2	32 ditto ditto	ditto	0 19 0	12 by 12 ditto ditto	ditto	0 17 6
24 3/4 ditto ditto	ditto	0 0 4 1/2	33 ditto ditto	ditto	0 19 6	12 by 15 ditto ditto	ditto	1 0 0
25 ditto ditto	ditto	0 0 4 1/2	34 ditto ditto	ditto	0 20 0	12 by 17 ditto ditto	ditto	1 2 0
25 1/2 ditto ditto	ditto	0 0 4 1/2	35 ditto ditto	ditto	0 20 6	12 by 19 ditto ditto	ditto	1 5 0
25 3/4 ditto ditto	ditto	0 0 4 1/2	36 ditto ditto	ditto	0 21 0	14 by 22 ditto ditto	ditto	1 13 0
26 ditto ditto	ditto	0 0 4 1/2	37 ditto ditto	ditto	0 21 6			
26 1/2 ditto ditto	ditto	0 0 4 1/2	38 ditto ditto	ditto	0 22 0	Round ventilator for 4in. opening	ditto	0 3 3
26 3/4 ditto ditto	ditto	0 0 4 1/2	39 ditto ditto	ditto	0 22 6	Ditto ditto 5 ditto	ditto	0 3 6
27 ditto ditto	ditto	0 0 4 1/2	40 ditto ditto	ditto	0 23 0	Ditto ditto 5 1/2 ditto	ditto	0 3 10
27 1/2 ditto ditto	ditto	0 0 4 1/2	41 ditto ditto	ditto	0 23 6	Ditto ditto 6 ditto	ditto	0 4 4
27 3/4 ditto ditto	ditto	0 0 4 1/2	42 ditto ditto	ditto	0 24 0	Ditto ditto 7 ditto	ditto	0 4 10
28 ditto ditto	ditto	0 0 4 1/2	43 ditto ditto	ditto	0 24 6	Ditto ditto 8 ditto	ditto	0 6 0
28 1/2 ditto ditto	ditto	0 0 4 1/2	44 ditto ditto	ditto	0 25 0	Ditto ditto 9 ditto	ditto	0 7 6
28 3/4 ditto ditto	ditto	0 0 4 1/2	45 ditto ditto	ditto	0 25 6			
29 ditto ditto	ditto	0 0 4 1/2	46 ditto ditto	ditto	0 26 0	METALLIC INDICATORS—		
29 1/2 ditto ditto	ditto	0 0 4 1/2	47 ditto ditto	ditto	0 26 6	Japanned (indicating open or shut) .. per pair	0 1 8	
29 3/4 ditto ditto	ditto	0 0 4 1/2	48 ditto ditto	ditto	0 27 0	Bronzed ditto ditto ditto	ditto	0 2 0
30 ditto ditto	ditto	0 0 4 1/2	49 ditto ditto	ditto	0 27 6	Metal ditto ditto ditto	ditto	0 3 3
30 1/2 ditto ditto	ditto	0 0 4 1/2	50 ditto ditto	ditto	0 28 0			
30 3/4 ditto ditto	ditto	0 0 4 1/2	51 ditto ditto	ditto	0 28 6	VENETIAN VENTILATORS, unfixed—		
31 ditto ditto	ditto	0 0 4 1/2	52 ditto ditto	ditto	0 29 0	10in. by 7in. front, 9 by 6 box, plain iron	each	0 9 9
31 1/2 ditto ditto	ditto	0 0 4 1/2	53 ditto ditto	ditto	0 29 6	12 by 9	ditto	0 15 0
31 3/4 ditto ditto	ditto	0 0 4 1/2	54 ditto ditto	ditto	0 30 0	15 1/2 by 10 1/2	ditto	0 17 6
32 ditto ditto	ditto	0 0 4 1/2	55 ditto ditto	ditto	0 30 6	15 1/2 by 10 1/2	ditto	0 2 0
32 1/2 ditto ditto	ditto	0 0 4 1/2	56 ditto ditto	ditto	0 31 0	10 by 7 japanned bronze	ditto	0 12 0
32 3/4 ditto ditto	ditto	0 0 4 1/2	57 ditto ditto	ditto	0 31 6	12 by 9 ditto ditto	ditto	0 17 6
33 ditto ditto	ditto	0 0 4 1/2	58 ditto ditto	ditto	0 32 0	15 1/2 by 10 1/2 ditto ditto	ditto	0 19 6
33 1/2 ditto ditto	ditto	0 0 4 1/2	59 ditto ditto	ditto	0 32 6	20 by 14 ditto ditto	ditto	2 4 0
33 3/4 ditto ditto	ditto	0 0 4 1/2	60 ditto ditto	ditto	0 33 0	10 by 7 japanned white and gold	ditto	0 16 6
34 ditto ditto	ditto	0 0 4 1/2	61 ditto ditto	ditto	0 33 6	12 by 9 ditto ditto	ditto	1 2 0
34 1/2 ditto ditto	ditto	0 0 4 1/2	62 ditto ditto	ditto	0 34 0	15 1/2 by 10 1/2 ditto ditto	ditto	1 3 0
34 3/4 ditto ditto	ditto	0 0 4 1/2	63 ditto ditto	ditto	0 34 6	20 by 14 ditto ditto	ditto	2 7 0
35 ditto ditto	ditto	0 0 4 1/2	64 ditto ditto	ditto	0 35 0	10 by 7 galvanised ditto	ditto	0 16 0
35 1/2 ditto ditto	ditto	0 0 4 1/2	65 ditto ditto	ditto	0 35 6	12 by 9 ditto ditto	ditto	0 18 6
35 3/4 ditto ditto	ditto	0 0 4 1/2	66 ditto ditto	ditto	0 36 0	15 1/2 by 10 1/2 ditto ditto	ditto	1 2 0
36 ditto ditto	ditto	0 0 4 1/2	67 ditto ditto	ditto	0 36 6	20 by 14 ditto ditto	ditto	2 5 0
36 1/2 ditto ditto	ditto	0 0 4 1/2	68 ditto ditto	ditto	0 37 0	Rocking cleats	ditto	0 1 0
36 3/4 ditto ditto	ditto	0 0 4 1/2	69 ditto ditto	ditto	0 37 6	Cords for ditto	per yard	0 0 2
37 ditto ditto	ditto	0 0 4 1/2	70 ditto ditto	ditto	0 38 0			
37 1/2 ditto ditto	ditto	0 0 4 1/2	71 ditto ditto	ditto	0 38 6	NOISELESS SILK-FLAP VENTILATORS, unfixed—		
37 3/4 ditto ditto	ditto	0 0 4 1/2	72 ditto ditto	ditto	0 39 0	11in. by 5 1/2in. front, plain iron	each	0 4 0
38 ditto ditto	ditto	0 0 4 1/2	73 ditto ditto	ditto	0 39 6	11 by 8 1/2 ditto ditto	ditto	0 7 0
38 1/2 ditto ditto	ditto	0 0 4 1/2	74 ditto ditto	ditto	0 40 0	11 by 11 1/2 ditto ditto	ditto	0 8 9
38 3/4 ditto ditto	ditto	0 0 4 1/2	75 ditto ditto	ditto	0 40 6	15 1/2 by 11 1/2 ditto ditto	ditto	0 10 0
39 ditto ditto	ditto	0 0 4 1/2	76 ditto ditto	ditto	0 41 0	11 by 5 1/2 ditto japanned bronze	ditto	0 4 6
39 1/2 ditto ditto	ditto	0 0 4 1/2	77 ditto ditto	ditto	0 41 6	11 by 8 1/2 ditto ditto	ditto	0 8 3
39 3/4 ditto ditto	ditto	0 0 4 1/2	78 ditto ditto	ditto	0 42 0	11 by 11 1/2 ditto ditto	ditto	0 10 0
40 ditto ditto	dit							

livered on Thursday, remarked that sanitary engineering might be called a modern science, as it was only since the passing of the Towns Improvement Act of 1847, and the Public Health Act of 1848 that serious attention had been given to the subject. Investigations were then made into the causes of zymotic diseases in towns, and it was found that want of efficient sewerage, defective house drainage, pollution of drinking wells, badly-constructed dwellings, and want of ventilation were among the main causes of the high death-rate. The sanitary engineer might then be said to have been created. To-day England stood in the front rank, America being her only competitor of importance. He then discussed the principles to be kept in view as regards town sewerage, especially as to the rainfall and the gradient of the sewers. He maintained that the Metropolitan scale, which allowed for only $\frac{1}{4}$ in. of rainfall in 24 hours, had failed, and it would fail everywhere where it was adopted under similar conditions. In London special supplementary surface drainage outfalls had been constructed to remedy the defects that arose from the design of the metropolitan main sewerage, and in other towns where this scale had been followed the local authorities would have to adopt similar remedial measures. There were advantages attending the separation of the rainfall from the sewers; but if by a separate system a duplicate system of drains to every house was meant, that was not either practicable or desirable. Sea outfalls required the greatest care as to their situation and construction, and if the currents were not favourable, crude sewage should not be discharged from them. In cases of this kind precipitation must be resorted to, and the effluent only discharged into the sea. With regard to the ventilation of sewers, after 40 years' experience, he had come to the conclusion that an open sewer down the centre of a street, with a good fall, would be the best form of construction. That, however, was impracticable; and he therefore said, Get as near to it as you can. The system of precipitation of sewage had lately grown more into favour. This was due, first, to the improved means of disposing of the sludge; secondly, to the failure of the so-called sewage farms; and, thirdly, to the growing tendency to combine precipitation with land filtration. Fortunately for England, the local authorities were now better prepared to resist cholera than in 1866. But our towns were still overcrowded. Much had been done during the last year under the Housing of the Working Classes Act, 1890; but a danger still remained, which local authorities must face. What was wanted was the erection of suitable dwellings to take the place of those condemned. Here was a splendid opportunity for the architect—to design a good, healthy dwelling for the poorer working class at a reasonable cost, so that local authorities might be induced to erect them. A good model working-man's home was wanted in our crowded towns, where there should be a large dining-room and a reading-room common to all, with a separate bedroom for each lodger. The sanitary architect should insist upon the following points:—(1) A naturally dry subsoil, or one made so by land drainage; (2) a damp-proof course, either of asphalt or two thicknesses of slate in cement; (3) walls built of hard kiln-burnt bricks, which would keep out heavy rains, and in the south of England hollow walls; (4) a good pitch to the roof and outside gutters—eaves gutters if practicable; (5) good ventilations under the floors and to the rooms by separate ventilating flues next the smoke flues as exits, and proper inlets; (6) drainage in stone-ware pipes outside the house, disconnected with the main sewer, and ventilated, or under the house cast-iron pipes with lead joints; (7) water closets with wash-out or flush-out basins, with soil-pipes outside the house carried up to the full size and ventilated; (8) sinks of all kinds and baths to be disconnected with the sewers, and to discharge over open gratings.

Mr. W. Hepworth Collins, of Bolton, forwarded a paper on "The Pollution of Rivers and Canals by Manufacturing and Industrial Operations." The writer urged that there was no reason why every manufacturer should not be compelled to deal with the polluted water upon his own premises. Possibly the more effective and economical way of dealing with the enormous volume of pollution from manufacturing sources was by concentration and by evaporation followed by condensation. The section resolved that it was

desirable that local authorities should have enlarged powers to compel manufacturers to cleanse the rivers into which their waste products ran, and if they did not do so, to carry out the work and charge the manufacturers with the cost.

Other papers of interest read in this section were that by Mr. Hubert L. Terry on the "Smoke Nuisance," who called attention to the little-used special powers of section 91, sub-section 7 of the Public Health Act of 1875, and advocated the appointment of chemical engineers as smoke inspectors; Dr. H. Kentford's paper on "Drain and Soil-pipe Ventilation," and that by Mr. Henry Law on "Apparatus for Softening Water."

In another section, Dr. Sykes read a paper on burial reform, in which the author advocated a system of earth-to-earth burial, but without coffins, which, he said, were an innovation that crept in in the time of Charles I. He urged that the control of the cemeteries should be vested solely in the Local Government Board. Sir Charles Cameron, while condemning interment in crypts and vaults, said he failed to see where harm could arise from well-kept cemeteries. Sir Thomas Crawford, while in favour of cremation, also saw no danger in a properly-kept cemetery that was not overcrowded. Other speakers advocated cremation.

CONSTRUCTIONAL DRAWINGS.—VI.

A ROOF IN STEEL.

THE strain in the diagonal tie-rods will vary according to the direction of the wind: those inclining to the left being strained when the wind is coming from the right, and those inclining to the right when the wind is coming from the left. The vertical strut NN' will be strained in either case.

The difficulty which is experienced in drawing a diagram for this form of roof on arriving at the strut EF, where the force is resolved into three directions, may be overcome in the following manner: Assume that the equal loads 2, 3, and 4, 5 cause equal stresses in the tie-rods DE and FG, and therefore that Dx drawn parallel to GF cuts off Ex equal to resultant of tensions

DE and FG acting in EF. To this add component of load 3, 4, as found at 4, z, which equals total stress in EF.

For specification for steel-work see BUILDING NEWS, Aug. 26, 1892.

I am indebted to Mr. D. C. Rattray, C.E., of Manchester, for the general design of this roof. The joints have been largely modelled upon those of existing examples of recent construction.

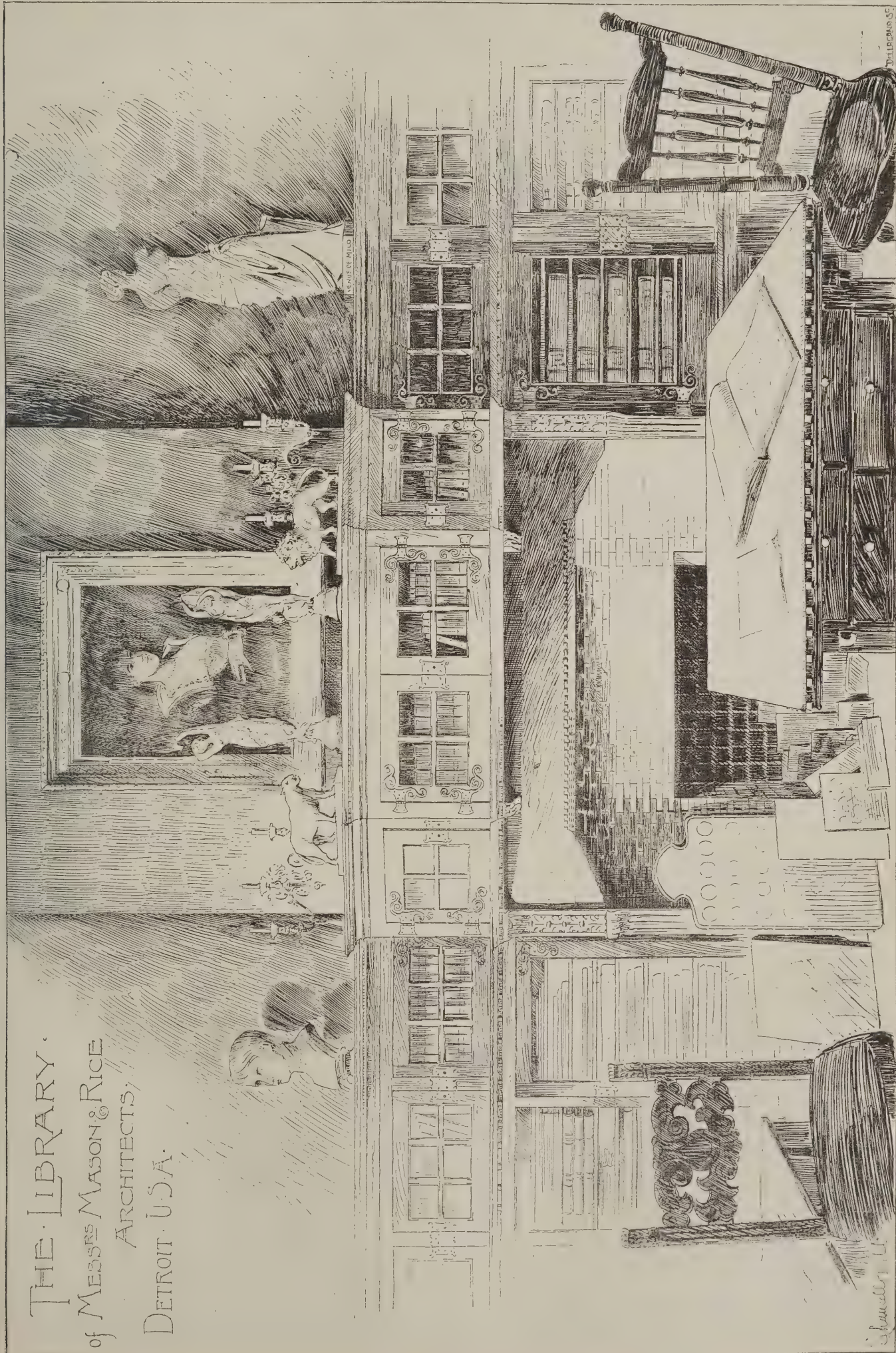
THE LIBRARY OF MESSRS. MASON AND RICE, ARCHITECTS, DETROIT.

THIS sketch shows the fireplace and a portion of the fittings of the apartment. A library is often now considered to be an indispensable adjunct to the offices of the larger firms of architects in America. Indeed, one is advisable anywhere where a collection of architectural works and illustrations is made. In such an apartment they can be kept in dust-tight cases, and suitably arranged for handy reference. And what more fitting than that architects should give a distinctive character to the room by the taste and appropriateness of its decoration, and by careful selection of good furniture and works of art? Our sketch was made from a photograph kindly sent by the architects.

Messrs. Watt and Wilson, of Glasgow, have nearly completed their contract for the section of the aqueduct from Lake Thirlmere to Manchester, between Barnfold, Goosnargh, and Chorley, about 19 miles, for £135,000. On this length there have been erected eight valve houses.

One of the small hill-side crosses occasionally found in the Lowlands has just been unearthed at Anworth, Dumfriesshire, and has been set up within the ruins of Ruthven's Kirk. It is a slab of red sandstone, and is at present 48 in. in length, 14 in. across its widest part, and about 4 in. thick. The cross, which is now 26 in. in length, and rudely incised, has its upper arm broken off. The width across the arms is 11 in., and the usual small incised boss appears in the centre. Proof was also found of the existence of a Pre-Reformation Church in a number of coffin-shaped tombstones roughly fashioned and shaped.

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W. H. B. 1892

THEATRES.—VIII.

By ERNEST A. E. WOODROW, A.R.I.B.A.

WE have already seen that the placing of the seats in the auditorium (Chapter VI.) is a matter of importance in reference to sighting and acoustics; now we have to consider their arrangement with respect to ingress and egress. In London the architect must be governed by the seventeenth regulation of the London County Council, which declares that a clear passage or gangway not less than 3ft. wide shall be formed at the sides and in the rear of the seating in every part of a theatre; and that such passages or gangways shall at all times be kept entirely free from chairs, flap-seats, or other obstructions, whether permanent or temporary. By this it will be seen that a fixed width of gangway is required, irrespective of the length of the rows of seats, and irrespective of the numbers likely to use the gangway as an exit. Authorities do not seem to agree upon this point. It is said by one that the number of seats in a row should never exceed twelve without an intervening gangway, and that the minimum width of the gangways should be equal to two seats in the respective section of the auditorium; these figures are given as the width of gangways in the various parts: stalls, 4ft.; pit, 3ft.; dress-circle, 3ft. 4in.; upper circle, 3ft.; gallery, 2ft. 4in.; the last named of which with a double gangway having dividing handrails firmly secured to the guard rails round the circle front.

I cannot quite agree, considering the question from the exit point of view, that the pit and gallery need a less width of gangway than other parts. The width of the gangway should be governed by the number of persons using it, and it should widen towards the exit, as each additional row of seats discharges a fresh current of people into it. This principle appears to have been adopted in New York, for in that city the regulations say that no seat in the auditorium of a theatre in New York can have more than six seats intervening between it and an aisle—that is to say, there cannot be more than thirteen seats in a row—and, further, that all gangways must be at least 22in. for every 100 persons, no aisle shall be less than 3ft. at its narrowest part, increasing at the rate of 1in. for every 5 running feet towards the exit.

Centre gangways have been objected to by managers, as they assert people will stand in them, obscuring the stage from those behind, and creating a disturbance which may produce panic. In a well-governed theatre surely the management can cope with such a small difficulty and insist upon the people sitting down and leaving the gangways free. Centre gangways have been objected to on another score, as it is said the actors object to the empty space in front of them, as it affects their performance. Upon that point I cannot comment here.

There is so much divergency of opinion in the question of seating and gangways at home and abroad that I propose reviewing shortly the requirements in Continental cities.

Very strict rules exist in Austria; the stall seats there must be hinged, to lift up, having a depth of at least 1ft. 9 $\frac{1}{2}$ in., a width of 2ft. 3 $\frac{1}{2}$ in., and a clear space in front of 1ft. 3 $\frac{1}{2}$ in. The minimum size for numbered seats is 1ft. 7 $\frac{1}{2}$ in. by 2ft. 1 $\frac{1}{2}$ in., or rather less than required by the London County Council. When seats in the pit and the galleries of the Austrian theatres are approached from either side, the space between the rows must be 4ft. 1in.; if only from one side, then the rows may be 3ft. 3in. apart. Cross gangways must divide every six seats, and the exit doors must be in line with them. Where, however, this is impossible, a clear space of at least 5ft. must be left all around between the last row and the wall.

In the evidence given before the Select Committee of the House of Commons this year it was shown by some witnesses that it was desirable in their opinion to license a theatre to hold only a certain number, like an omnibus or steamboat. In Austria such provision is made, and theatres are licensed to hold a fixed number of persons, and such number, whether in boxes, stalls, numbered or unnumbered seats, and the spaces set aside for the special purpose of standing-room in pit or gallery, may not be increased on any pretence.

The obstruction of gangways by standing, is certainly most objectionable, although it has been argued that those standing will be the first to be out of the building on an alarm being

raised; true, but they must impede those behind them to some extent. Standing room in spaces set apart for the purpose, as allowed in Austria, does not appear objectionable, provided it is done only to a limited extent, and does not block the line of exit.

The use of camp-stools in gangways everyone would surely forbid, as also the closing of gangways with flap or automatic seats; but in Brussels there is this rule: "No stool may be placed in any gangway without the consent of the local authority; these stools should be of a pattern to be approved, and should fold back in such a manner as not to interfere with the passage-way." But it appears it is self-evident that the time occupied by the person seated in rising and walking out of the gangway is valuable time lost, and should one occupant of such a seat fail to rise, through fright, or should the spring or automatic seat not act, the gangway would be effectually blocked and rendered useless. Gangways cannot, in my opinion, be too clear or too numerous.

There is another rule in Brussels which, one might almost say, contradicts the one already quoted—the chairs and seats, with the exception of those in the private boxes, should be fixed to the floor. There must be at least two lateral gangways, and a third one may be required by the authorities; in this city, as in the regulations of Austria already cited, the width of the gangways is made in proportion to the number of people who have to use them, being calculated upon a basis of 3ft. 3in. for every hundred persons.

The number of seats in a row without intersecting gangways is limited in St. Petersburg to twelve; a middle gangway must be 4ft. 5in. wide, and two side passages 2ft. 11in. wide.

Paris seems to be behindhand in her requirements on this point, as all seats upon the ground floor of the auditorium, and those of the galleries must be provided with only two side gangways not less than 3ft. 3 $\frac{1}{2}$ in., which, however, may be substituted by a single middle passage 4ft. 3 $\frac{1}{2}$ in. wide—a provision which, in my opinion, is totally inadequate for these two large divisions of a theatre.

From these rules it may be taken that from twelve to thirteen seats in a row is the maximum that should be allowed without an intersecting gangway, and that the gangways should widen towards the exit. All chairs and seats should be securely fixed to the floor, as a loose chair will fall over and trip up anyone hurrying out of the building. The pattern of chair to be used is important. In Paris there is a rule that the seats of the chairs must fold against the backs. I drew attention some little time back to an automatic tip-up chair of German invention; this was illustrated in the BUILDING NEWS March 25, 1892. The object of this chair was to allow gangways from back to front, as well as from right to left. Seats made after the manner of American bent-wood chairs have been recommended as comfortable and cool in summer; stuffed seats are liable to harbour dust, and be too warm for comfort. For the personal convenience of the audience, each seat should have a division made by means of arm-rests, for where the seats are so divided the manager cannot "pack" the house to the inconvenience and danger of the public. This would be a simple manner of limiting the number the house should contain, at any one time, and be a means of fulfilling the recommendation made before the Select Committee to restrict the number of persons to be accommodated in a theatre, &c. The numbering and "booking" of every seat in the auditorium, as adopted at Olympia when under the management of the late Mr. Barnum, and as now carried on by the managers of this place of entertainment, certainly has met with the approval of the public, as it permits all classes to visit the entertainment with equal comfort. I cannot say whether the theatre managers would agree to "book" the cheaper parts of the house in the same manner; were it done, it would be a cure for overcrowding, and secure admission to the theatre without the waiting at the pit and gallery door for hours before the commencement of the performance. On this subject there will be more to learn when considering the entrances and exits to a theatre. The managers' objections to booking the cheaper seats are doubtless the inability to admit any above a fixed number during the run of a successful piece. The casual passer-by would not

have the same chance, as now, to obtain a good seat in the house, and people who had only made up their minds, on the spur of the moment, to visit the theatre would be deterred from doing so, through not having previously booked their seats.

Lately an improvement has been made in providing in the circles doors or openings at the end of every or every few rows of seats leading directly into the corridors. There is only one objection to this arrangement: that where the doors open into the side corridor, they are apt to become obstructions to the crowds passing along the corridor. The St. Petersburg regulations insist that to each intersecting passage there must be, on the ground floor, a corresponding separate exit into the corridor which surrounds the auditorium, and for every 150 visitors there must be one exit not less than 4ft. 8in. in width. In the galleries, dress-circles, and amphitheatres the exits to the surrounding spaces must be not less than 4ft. 8in. for every 50 persons.

Where, as in the circles, there are steps in the gangways, the nosings of these steps should be made prominent by tacking a strip of white stuff, where there are carpets, along the nosing, so that the step can be easily seen. In the gallery, and sometimes in the upper circle, it is necessary to provide a protecting iron or brass rail fixed on to the "rester" of the gallery front, so as to prevent any one jumping or falling into the auditorium. This is especially necessary where the gallery is very steep, as people rushing in from the top of the gallery, anxious to obtain the front row of the seats, may trip and fall headlong down the gallery and over the front. To prevent such an accident, handrails, as already mentioned, are requisite in the gangways of the gallery.

If the seats are without backs, as is sometimes the case in the pit, intersecting gangways are not needed, as people can walk over the seats, but the discomfort arising from sitting for three to four hours on a form which has no rest for the back is so great, that it is hoped in the future both the pit and gallery will be provided with seats with back rails and divisions, or arm rests. The comfort of the pit has been too long neglected.

Although I have advocated here the adoption of the methods used in Austria and New York for the arrangement of gangways, I must remind the designer of an auditorium that he must at no time lose sight of the interest of his clients, and that he must so devise the disposition of his seating and his gangways as not to produce a loss on the nightly takings; it is true that many gangways mean few seats, and few seats mean small profits; but I contend that an adequate provision of gangways can be obtained without permitting the manager's pocket to suffer. Gangways are frequently of unnecessary width near the stage and not wide enough near the exit; if they were made to widen out in the manner advised in proportion to the number of people using them, I do not think there would be any more serious loss of space than where a gangway is the same width its entire length.

Where the floors of the circles and area are of concrete, provision should be made to secure the seats to the floor by inserting lead or other plugs in the concrete, into which the lugs on the bottom of the legs of the seats can be secured down.

There are many matters of a very minor character, which for all that are sufficiently important to receive the attention of the architect in arranging and furnishing the interior of the auditorium. Carpets, where they are needed, should be so fastened to the floor that they cannot ruck up, and be the cause of anyone tripping or falling over them. Where the floors are stone or concrete, provision should be made for securing the carpets. For similar reasons where there are mats, they should be sunk in squares, so that their upper face is flush with the floor-line. Although carpets, &c., should be secured for the safety of the public, they should be so laid as to be easily taken up and beaten for the comfort of the audience. Carpets and matting, which are frequently used to deaden sound, are often filthy and highly inflammable. A wood-block flooring laid on top of the concrete has neither of these undesirable qualities: it can be easily washed, and when secured to the floor below, not easily burnt; linoleum and kamptulicon are admissible; but a wood-block floor gives a secure fastening for seats and carpets. The use of curtains is sometimes objectionable;

they are frequently hung before the exit doors to prevent draught—which, by the way, is generally caused through inefficient ventilation—they therefore obscure the existence of the exit door, and destroy the virtue of its presence. Where this is done, care should be taken to indicate, in a conspicuous manner, the fact that there is an exit door behind the curtain. Another evil of curtains is, that they are often so long as to drag the ground, and anyone passing out in a hurry runs the risk of treading on them, falling over, and being trodden to death—a small cause but a serious result, showing what care should be given to minute details in the arrangement of theatres.

The desirability of acquainting the occupants of the seats with the position of the exits is self-evident. The London County Council provide for this by their thirty-second rule:—"All exit and other doors used by the public shall be indicated by painted notices in 3in. white block letters upon a black ground. Such notices shall be painted on the doors and walls at least 6ft. 9in. above the floor. The words 'no exit' shall be painted at least 6ft. 9in. above the floor, in 3in. white block letters upon a black ground, upon all doors, in sight of the audience, which do not lead to exits."

The rules as to notices in other countries are somewhat similar, and need not be quoted here. I have before advised the printing of the plan of each section of the seating on the programme, as a means of educating the audience as to the position of the exits, a knowledge acquired in moments of calm which would instinctively become of immense value in moments of panic, and which indeed would tend to allay or effectually prevent panic. It is the thought of the inability to escape which creates the desire to be the first to rush out.

When there are doors with glass panels in them, such as swing doors, or doors to break and check currents of cold air from entering the auditorium, these panels should be protected by bars or grilles across them, as anyone rushing out might put their hands through the glass and seriously injure themselves. Swing doors in the auditorium should not be made so that they cause a noise in closing, especially where they close of themselves. It appears to me that the Norton door check is an admirable arrangement for securing a silent closing of such doors as these in a theatre. The noise of a door slamming is apt to disturb the performance and disconcert the actors.

STABILITY OF WALLS ON SOILS.—VI.

Systematic Methods of Grouping and Concentrating Loads.

THE modern necessities of massive buildings being erected upon weak or compressed soils have developed scientific methods of treating the problems of the distribution of foundations. The permanent structural weights and pressures are systematically equalised, grouped, and concentrated at a convenient number of points in suitable positions in harmony with the main internal arrangements of the building, adapting its forms to its special uses. The various assemblages of weights are reduced to their statical resultants. The supporting points are placed at the common static axes of the contributory loads, with their bases placed geometrically concentric to the axis, and expanded in proportion to the weight of the accumulated load, so as to produce an unvarying safe unit pressure over the area of the underlying soil which shall not exceed its safe permanent supporting power.

Order of Proceeding in Designing Foundations.—It will now be evident that in order to proceed to scientific designing of foundations all the weights and forces involved should receive systematic treatment. For purposes of illustrating the method, we assume that the procedure is naturally resolved somewhat into the following order of occurrence:

1. Having determined the internal arrangement of the building to suit the accommodation required as regards form and dimensions, and the distribution of rooms or apartments on the floor area, including staircases, landings, corridors, internal wells for lighting interior, for lifts, &c., the several floors corresponding in the main points and lines of their arrangements, so that uniformity and concentration of loads and weights and of points of support for all parts throughout the height of the building shall be preserved

symmetrically; economy of materials and duplication of work and of structural parts thus secure considerable economy of cost of execution.

2. *Separating and Limiting the Area and Extent of Fire Insurance Risks.*—The nature and extent of fire risks are greatly influenced by the nature of the intended occupation of the building and the effectiveness of the provisions made in the design for separation of risks by proper division walls carried through and above the roof, by fireproof floors and partitions, and having all means of access of fire between the separate risks effectually stopped according to the regulations of the fire insurance companies. Due attention must also be given to the provisions of the local building by-laws in operation for the time being.

3. Determine the effective (not clear) heights and number of stories, the architectural composition and treatment of the masses of the façade, and any special features, such as pavilions, oriel and bay windows, balconies, verandahs, loggia, engaged columns, pilasters, porticoes, pediments, &c., and the materials thereby involved, the density of which will influence the weights and pressures which have to be supported by the foundations.

4. Determine the various thicknesses, with their respective heights, of the façade walls, with all stone dressings, architectural features, and details, as well as of the main and party-walls, and also the fire and other walls and partitions passing through and above the roof, including all chimney loads, loads from pavilions, gables, gables, dormer-walls, loads from the roofs and gutters, and all appendages thereto.

5. Determine the dimensions and weight of beams, girders, bressummers, &c., adjusted to their several spans, also of fireproof and other floors, stairs, staircases, columns, and stanchions, piers, and posts, with their estimated loads, dead or live, or both, as the case may require, and all sources of load accumulations at points of concentration and discharge.

6. Determine all the loads which are concentrated at the different points of discharge, and whether acting axially or eccentrically upon the columns and structures, piers, &c., together with the weights of all intervening and lower piers, footings, &c. The floor loads include not only the actual structural weight, but also those due to fittings, furniture, machinery, goods stored or warehoused, and also live loads of occupants, according to the intended manner of occupation, being careful to omit nothing which will add to the load at any time imposed by the building upon its underlying soil.

7. We are now in a position to obtain the total loads at all the points of concentration which are to be discharged upon the foundation soil, and to determine the position of the axis of the proper resultant of all the concentrated loads—the forms of the ultimate distribution of the pier footings—duly observing the points of imposition of all abutting loads, such as those of spandrels and transoms in the bays, in fenestrated walls, also those of oriels, projecting cornices, and other projecting features and structures.

8. It is requisite that adequate methods of testing the safe, permanent bearing power of the soil in question should be adopted. These should have in view an investigation of the character of the stratigraphy of the site, and the composition and structure of its petrography. When solid rock is not within convenient reach, and that piling of any description is not desirable, means of ascertaining and utilising the bearing power of the intervening soil should be sought.

Stratigraphy.—Particulars of this are usually obtained by means of auger borings, digging deep wells, or examining existing wells, mine-shafts, deep quarries, earth excavations, railway cuttings, &c., in the vicinity.

Petrography.—The method of treating this branch of the question will depend on the nature of the rock or soil. A practical guide in a simple method of investigating the character of an alluvial soil is that adopted by Mr. A. Waterhouse, R.A., with the foundation soil of the Hotel Metropole, Brighton. Having, by trial holes, dug to a considerable depth, he found that solid chalk was at far too low a level to bed the foundations directly upon it, while all the soil above the rock consisted of a geological *débris* of flint and gravel (of 3in. pieces and smaller) along with chalky clay, and only a little water. The flints and gravel were screened away in sufficient quantity for use in the concrete required in the foundations, floors, &c., and the residue of the finer chalk and clay, by washing, redrying,

and weighing, was found to be about 10 per cent. of the whole mass. From this he judged that $2\frac{1}{2}$ tons per square foot might safely be imposed upon it.

9. Having determined the safe bearing power of the soil per unit load area, then the area of the pier footings—

$$= \frac{\text{Total pier load}}{\text{Unit load area as tons per square foot.}}$$

The square root of the above quotient is the length of the side in feet of a square footing, or if there is a fixed breadth or length, divide by either, gives the corresponding side of the rectangular footing.

Designing Disposition of Foundations.—In the ordinary range of civil and domestic buildings it is seldom that the designing of the footings necessitates the taking account of their capability to resist overturning of the wall, and yet this problem should not be overlooked, for buildings have been overturned by wind force during the process of erection, though in some cases the point of overturning has been at a level above that of the footings, as occurred at Glasgow some years ago. In tall mill or factory chimneys, towers, steeples, and extremely high or exposed buildings, the resistance to overturning becomes a necessity in the design, and we shall therefore consider this problem in its order, but it shall first be considered in its relation to the capability to transverse resistance to the weight of the imposed loads, when the area of the footing base has been increased in proportion to the load, so that the safe unit static resistance of the supporting soil shall not be exceeded. The design of the foundation supporting area and its proper distribution at points of load concentrations will be presently considered.

Designing the Off-sets of Footings in Different Materials.—The off-set of masonry footings is frequently solved as a mere rule-of-thumb problem; but it is more satisfactory to be assured that an off-set is safe for its load than taking it for granted. The all-importance of being assured of safety seems to demand that a sure method of ascertaining it should be at the fingers' end of the designer, for a lamentable failure of the foundations may result from inadequate transverse strength of the footing off-sets under a desire or a necessity to spread the footing base very rapidly within the least height.

By way of illustration, we will consider the first course of footings *ff*, Fig. 15, off-setting

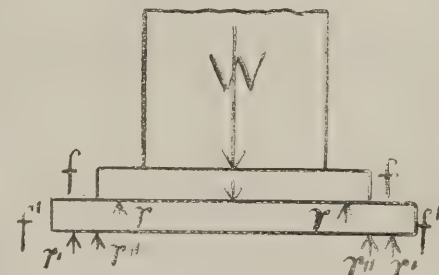
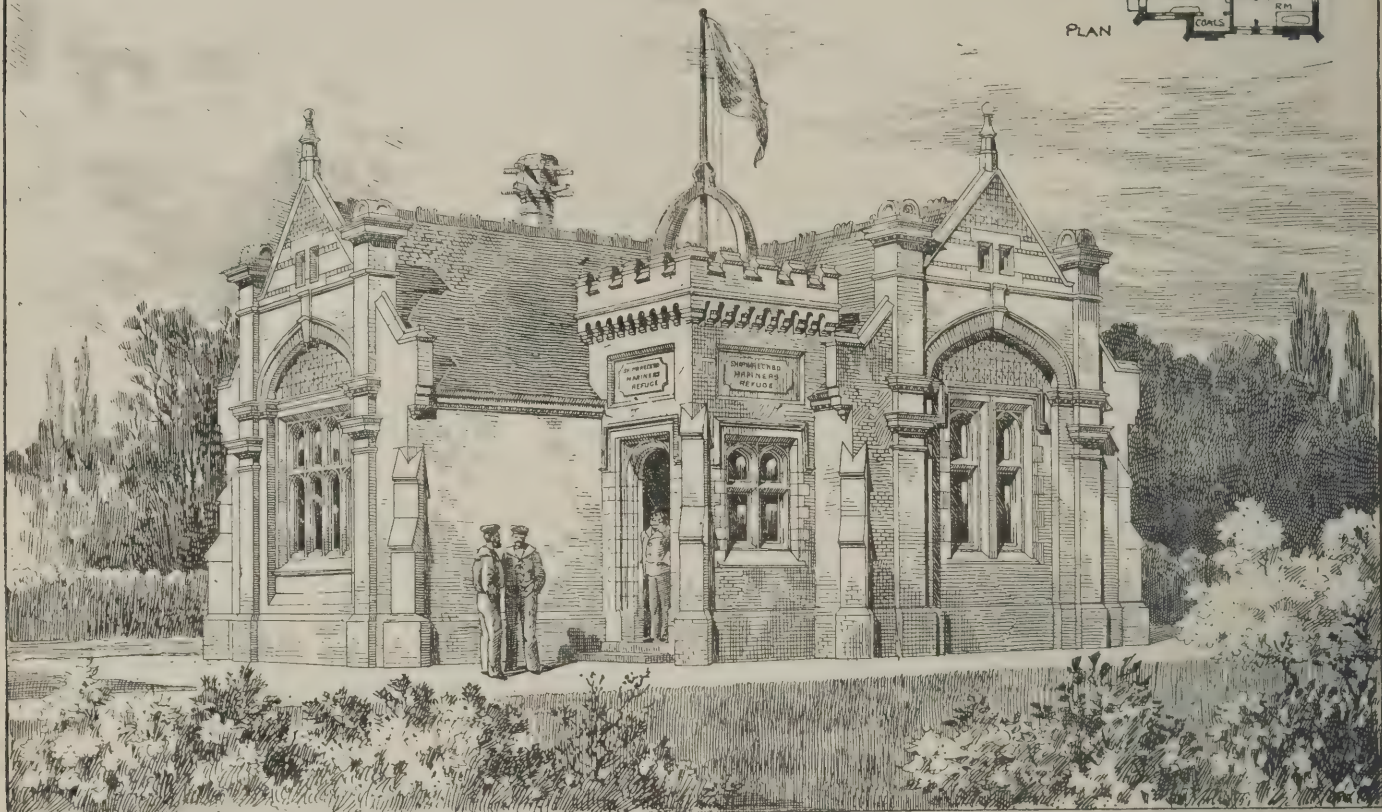
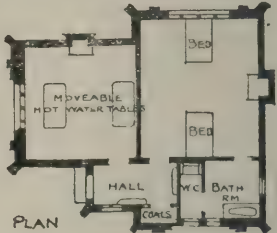


FIG. 15.

under the base of the wall *W*. It will be observed that the part of the footings projecting beyond the faces of the wall act as cantilevers, in which the outer end *f* is free, and the inner end is fixed or rigidly confined under the wall-base. The load and the reaction are uniformly distributed over the projecting area. The reaction *rr*, or *r'r'*, may be the pressure of a lower footing course, or that of the foundation soil, or of a bed of concrete that is frequently interposed between the masonry footings and the soil. *r''r''* are the centre points of the sum of the reactions of both the courses *f* and *f'* outside of the wall-face, but each course must be estimated separately for its respective projection beyond the wall-face. The conditions which regulate the extent of the safe off-sets *ff*, or *f'f'*, are the intensity of pressure expressed in pounds, hundredweights, or tons per square foot, the transverse tenacity of the material used, and the depth *d*, or thickness *t*, of the footing course.

As the pressure is uniformly distributed, it is equal to the load upon the area of the offset concentrated at the centre of the projection, and if this load be $\frac{1}{2}$ the projection it = continued product of $\frac{1}{2}$ th of the modulus of rupture (*R*) in lb. per square inch, the breadth or projection of

MARINERS' REFUGE AT GORLESTON, GREAT YARMOUTH.
H. DUDLEY ARNOTT, ARCHT.



the footing course, and the square of the thickness (ℓ). Let p = maximum projection of footing course, t = its thickness, P = pressure in tons per square foot on bottom of footing course, R = modulus of rupture, which is 18 times the centre breaking load of a level beam of uniform rectangular section supported at both ends. In the shape of a formula, this may be expressed thus—

$$p = \frac{1}{8} t \sqrt{\frac{R}{P}}$$

which gives the maximum rupturing projection. Therefore there must be a safe margin allowed according to the quality of the material and workmanship, and the precision with which the loads have been computed at their full value, static or dynamic, as the case may be. The transverse strength of different concretes, sandstones, limestones, bricks, &c., may range from $\frac{1}{2}$ to $\frac{1}{4}$ lower or higher than the average experimental data of recognised authorities, according to the quality and degree of correspondence of the materials in question with the quality or character of the standards of materials furnishing the data supplied by the experimental authorities, but it must be remembered that all such tests have been obtained with small carefully-selected specimens of excellent quality, free from all flaws and irregularities. The tabulated data is a mean between the highest and the lowest results, which may differ in some materials very considerably, lower or higher.

The following are the projections, in terms of thickness, which may safely be given for good materials of the kinds named. Thus for good hammer-dressed stone in large rectangular blocks, projecting less than two-fifths of their length—i.e., more than three-fifths of their bedding area—being under the course immediately overlying it, and laid in good Portland-cement mortar. For rubble in large, well-bedded stones, laid in good strong mortar, a very little deduction need be made from the projections tabulated, but the pressure above the course must not exceed the safe crushing strength of the mortar. For rubble in smaller irregular-

shaped stones laid in Portland cement, the projection should be very little more than allowed for concrete. If rubble be laid in lime-mortar, then the projection should not exceed half that allowed for cement-mortar.

TABLES OF OFF-SETS OF FOOTINGS.

Materials.	R in lbs. per sq. in.	Off-set in parts of thickness for a pressure on bottom of course of 1 ton per square foot.
Granite	1,800lb.	2-1 times thickness
Limestone	1,500lb.	1-9 " "
Sandstone	1,200lb.	1-8 " "
Slate	5,400lb.	3-6 " "
Best hard brick	1,500lb.	1-9 " "
Hard brick	800lb.	1-4 " "
Concrete: 1 Portland cement, 2 sand, 3 pebbles	150lb.	0-6 " "

Note.—For other pressures per square foot use the corresponding multiplier or fraction of a ton.

The factor of safety of the above is 10.
For other factors of safety use the corresponding fraction of R in applying formula.
(To be continued.)

MARINERS' REFUGE AT GORLESTON, GREAT YARMOUTH.

THIS building, now in course of erection, is situated near the Brush, Gorleston. The site is being built by voluntary contributions, and is a pretty and convenient one, and commands a grand view of the river Yare and North Sea. It is built with local red bricks and black joint, the dressings being of Cossey ware. The roof is covered with plain tiles, and chimney-shafts of red brick. The internal joinery will be of pitch-pine varnished, and the general fittings will include large fireplaces, bath-room, zinc-lined

tables fitted to receive hot water. The bath will be heated by gas; beds will be provided for the comfort of injured persons brought ashore from wrecks, &c. It has been designed, and is being carried out, under the superintendence of Mr. H. Dudley Arnott, architect, Gorleston, Great Yarmouth. The contractor is Mr. J. Y. Cockrell, of Gorleston.

CHIPS.

Mr. T. H. Shipton, late assistant borough surveyor of Tewkesbury, has been elected assistant road surveyor to the Worcestershire County Council.

As a part of the work of doubling the South Devon division of the Great Western Railway, a new tunnel is being driven alongside the old one at Marley, near Brent. The new tunnel is 856 yards in length, is quite straight, and is connected by three openings with the old tunnel. Mr. Lovatt, of Wolverhampton, is the contractor.

A committee has been formed for the purpose of erecting in Worcester Cathedral a memorial to the late Bishop Philpott. £900 has already been raised in the diocese, and the work has been assigned to Mr. Thomas Brock, R.A., for execution.

Dr. Danford Thomas, on Saturday, held an inquest at Kilburn concerning the death of William Williams, 65, lately residing at 11, Brondesbury Villas, Kilburn. Deceased, a slate merchant, carried on business at South Wharf-road, Paddington, and on the 22nd ult. went to the premises of Mr. Preyer's saw mills, of Kilburn, and accidentally fell down a flight of steps leading to the engine-room. He died on Wednesday from injury to the brain. The jury returned a verdict of accidental death.

The Mayor of Southport will on the 29th lay the foundation-stone of a new infirmary, which will cost, exclusive of the five-acre site, which has been presented, over £13,000. Mr. C. Sydney Ingham, of Manchester, is the architect.

The Manorhamilton Board of Guardians have discharged Mr. Henry Cummings, appointed by them as engineer and clerk of works, on the ground that he supported the Conservative candidate at the recent county election.

CONTENTS.

The Art of Inconspicuousness	411
Bad House-Drainage	411
Working Drawings and Specifications	412
Iron Arches of Large Span.—I.	413
Prices.—XLVII.	414
The Sanitary Congress at Portsmouth	415
Constructional Drawings.—VI.	416
The Library of Messrs. Mason and Rice, Architects, Detroit	416
Theatres.—VIII.	418
Stability of Walls on Soils.—VI.	419
Mariners' Refuge at Gorleston, Great Yarmouth	420
The Building News Directory	421
Our Illustrations	421
Wayside Notes	440
The Alhambra Alterations and Decorations	440
Residence at Catton, near Norwich	441
An Exhibition of Architectural Photographs	441
Building Intelligence	442
Competitions	442
Engineering Notes	442
Architectural and Archaeological Societies	442
Correspondence	443
Intercommunication	443
Legal	444
Legal Intelligence	444
Water Supply and Sanitary Matters	444
Stained Glass	445
Statues, Memorials, &c.	445
Our Office Table	445
Trade News	445
Tenders	446

ILLUSTRATIONS.

SELECTED DESIGN FOR MANCHESTER NEW TECHNICAL SCHOOL.—APSE AT COUTANCES CATHEDRAL.—CRYPT, MONT ST. MICHEL.—"SUNFIELD," DAISY HILL, BRADFORD.—BIBLING CHURCH.—MARIA GREY TRAINING COLLEGE, BRONDESURBY.—DESIGN FOR A ROSEWOOD CABINET.—A ROOF IN STEEL.—RESIDENCE AT CATTON, NEAR NORWICH.—SHIPWRECKED MARINERS' REFUGE, GORLESTON.—THE LIBRARY OF MESSRS. MASON AND RICE, ARCHITECTS, DETROIT, U.S.A.

Our Illustrations.

MANCHESTER TECHNICAL SCHOOL: SELECTED DESIGN.

LAST week we described at some length all the more important designs sent in for this great work, and to-day we illustrate the selected designs by giving the two principal plans, and the general perspective views showing the main front in Sackville-street, with the return façade facing Whitworth-street. Messrs. Spalding and Cross, of Queen Victoria-street, London, are the architects. There can be no doubt as to the superiority of their elevation over those to which the other premiums have been awarded, while their plans, as can be readily seen by our accompanying reproductions, are well balanced, well lighted, and practically arranged. In some respects the elevation, in its balance of parts, carries out the same idea which is observable in the City of London and Technical Guilds Institute in Exhibition-road, Kensington, which Mr. Alfred Waterhouse, R.A., erected ten years ago. The Manchester building, however, is treated with perhaps greater breaths of wall space, the fenestration being grouped together more decidedly.

APSE OF COUTANCES CATHEDRAL.

THE apse of Coutances is one of the finest examples known of this method of terminating the east end of a church—a method which, while common enough in France, is comparatively rare in England. Together with the rest of the Cathedral, it is in the Early French style, dating from the early part of the 13th century. The effect produced by the curved aisles, with their maze of arches and columns, is superb, and must be seen to be thoroughly appreciated. To the absence of the usual partition walls of the side chapels must be attributed in great measure the remarkable beauty of this apse, the choir being, in fact, surrounded by a double ambulatory, divided by columns. The round abacus used here is a peculiarity worth noting. In contemporary work in England, the square abacus, which disappeared with the Transition, would never be found; but in France the square abacus continued more or less through all the styles, and constituted one of the principal points of difference between the Gothic architecture of the two countries. It is only occasionally, as here at Coutances, that the round abacus is to be found.

CRYPT DE L'AQUILON, MONT ST. MICHEL.

OF all the parts of that extraordinary place, Mont St. Michel, perhaps none are more interesting

than those ancient portions which formed part of the primitive monastic buildings, and of which the illustration shows that part known as the Crypte de l'Aquilon. They date back to about the year 1020, having been founded by Duke Richard II., grandfather of the Conqueror, some fifty years before Norman architecture was practised in England. The part seen in the illustration, however, is later than this, having been built by Roger II., the eleventh abbot, between 1106 and 1123, and is in the Norman style, the abacus being of the characteristic Norman shape. The stairs lead up to the ancient promenoir or cloister of the monks, of which the Crypte de l'Aquilon forms the sub-structure. These communicate with a vast series of buildings constructed by Robert de Torigni towards the end of the 12th century, and extending all round the north side of the mount. They included the infirmary, hostelry, the chapel of St. Etienne, with its far-famed Black Virgin, the dungeons, and the monks' cemetery—a dismal vault of vast proportions, capable of holding generations of Benedictines, built in the heart of the rock, and in perennial darkness. We are indebted to Commander Charles E. Gladstone, R.N., for these capital photographs. Others, by the same hand, will follow at an early date.

"SUNFIELD," DAISY HILL, BRADFORD.

THIS house has been erected at Daisy Hill, a pleasant suburb of Bradford, and commands an extensive view of the hilly country to the south and west. It is built of local stone, with sandstone dressings from Guiseley, and is roofed with green Westmoreland slates and red-tile cresting. The works have been carried out by local builders from the designs of Mr. Herbert Hodgson, A.R.I.B.A., of Bradford.

DISTRICT CHURCH, BIRLING, KENT.

THE view and plan are of the west end. The narthex opens into the nave by a wide arch. Carried on an arcade at the springing level of this arch is a ringing-stage, the wire bell-ropes passing through guides in the roof of the narthex. The ringing-floor is reached by means of a stair entered from the outside. Mr. Hubert Bensted, F.R.I.B.A., of Maidstone, is the architect of the work illustrated.

THE MARIA GREY TRAINING COLLEGE, SALUSBURY-ROAD, BRONDESURBY, N.W.

THIS building is pleasantly situated upon a site of about an acre in extent near the Queen's Park, and within easy walking distance of Kensal Rise and Brondesbury railway stations. It has been erected to provide a suitable home for carrying on the work of the Maria Grey Training College and the High School for Girls and Kindergarten, which were formerly located in Fitzroy-street and Fitzroy-square, W. The college schools are now under one roof, and designed to accommodate about 75 day students and 200 children. On the ground floor are library for students, 31ft. by 22ft.; luncheon room, 28ft. by 23ft.; kindergarten rooms, 17ft. 3in. by 19ft. 6in., and 21ft. by 19ft. 6in.; ample and well-lighted cloak-rooms; kitchen, 19ft. 6in. by 17ft. 3in., with scullery, larder, heating chamber, and offices. W.C.'s and lavatories for students and pupils, and a stone staircase, are arranged in a detached block near the pupils' entrance. On the first floor (school) are an assembly room 60ft. by 28ft., five classrooms of various dimensions, one division room, rooms for the principal and secretary, waiting-room, &c. On the second floor (college), are teachers' room, studio, 31ft. by 22ft.; lecture-room, 24ft. by 21ft.; three classrooms, and laboratory, 22ft. by 18ft. On the third floor are five music-rooms and two bedrooms. The principal, and for students, entrance, owing to the nature of the site, is across a raised footway from Salusbury-road to the first-floor level, and a wide staircase at the entrance gives access to every floor. The pupils' entrance is on the ground floor, approached by steps from the Chevening-road. At this entrance also is a staircase, giving access to each floor and to the lavatories. The building is faced with red bricks and covered with Broseley tiles. All the windows have reversible sashes, which can be cleaned from the inside; all the floors are polished. The interior is warmed by ventilating grates, supplemented by hot-water pipes of medium pressure. The building has been erected for the Council of the Teachers' Training and Registration Society, at a cost of about £10,000. The school portion has been occupied since Easter; the work of the

training college will recommence early in September. The architect is Mr. J. Osborne Smith, F.R.I.B.A., and F.San.Inst., of 34, Southampton-street, Strand; and the builder Mr. Chas. Wall, of Chelsea.

"BUILDING NEWS" DESIGNING CLUB: A ROSEWOOD CABINET.

THIS design for a drawing-room piece of furniture was sent in by "Vulcan" last June according to the conditions issued for the guidance of the members of our Designing Club, and we awarded him the second place in this competition. An illustration of the design placed first figured in our issue for June 10, when a review of all the drawings submitted for this subject was given. We then said of this design: "'Vulcan' gains little by introducing the two figures right and left of his cabinet, and the vertical lines of the upper part seem needlessly numerous. It is a commodious piece of furniture, but would be more useful if another shelf had been introduced for the display of small articles in the principal cupboards. For rosewood there seems a little too much timber in the design." The illustrations of designs for a shooting-box in the Highlands will appear very shortly. This was the concluding subject for the past session of the club's work. The new session will begin early in November.

CONSTRUCTIONAL DRAWINGS: VI.—A ROOF IN STEEL.

(See description and further sketches on p. 416.)

CHIPS.

The Jewish synagogue, Fountains-road, Kirkdale, Liverpool, was reopened on Saturday, having been redecorated at the hands of Messrs. Raffle and Campbell, at a cost of £300.

A new Wesleyan chapel in Oldfield Park district, Bath, was opened last week. It has cost nearly £2,000, and is built of stone. The chancel seats 350 persons, and beneath it is a schoolroom and infants' room.

The Chatham town council have instructed their borough surveyor to prepare plans for a technical institute at the east end of High-street, at a cost of £2,500.

The excavations for the partial rebuilding of Sir Joseph Williamson's School at Rochester have laid bare the base of the north tower of the east gate of the ancient fortified city.

On Saturday a monument to the late Rev. Robert Shaw Hutton, D.D., minister of the parish of Cambusnethan for 40 years, was unveiled in Cambusnethan Cemetery, Wishaw. The monument is of red sandstone and granite; it is in the Gothic style, and has been sculptured by Mr. Cumming, of Wishaw, from drawings by Mr. Wallace, architect, of London.

Prof. Reginald Stuart Poole, who for nearly forty years has been connected with the department for coins and medals, will retire from the British Museum at the close of the year. On the retirement of Prof. Sir Charles Newton, K.C.B., from the professorship of archaeology at University College, London, Mr. Poole was elected his successor.

The Earl of Rosebery will open the Borough-road Polytechnic, near St. George's-circus, Southwark, on Friday afternoon next, the 30th inst.

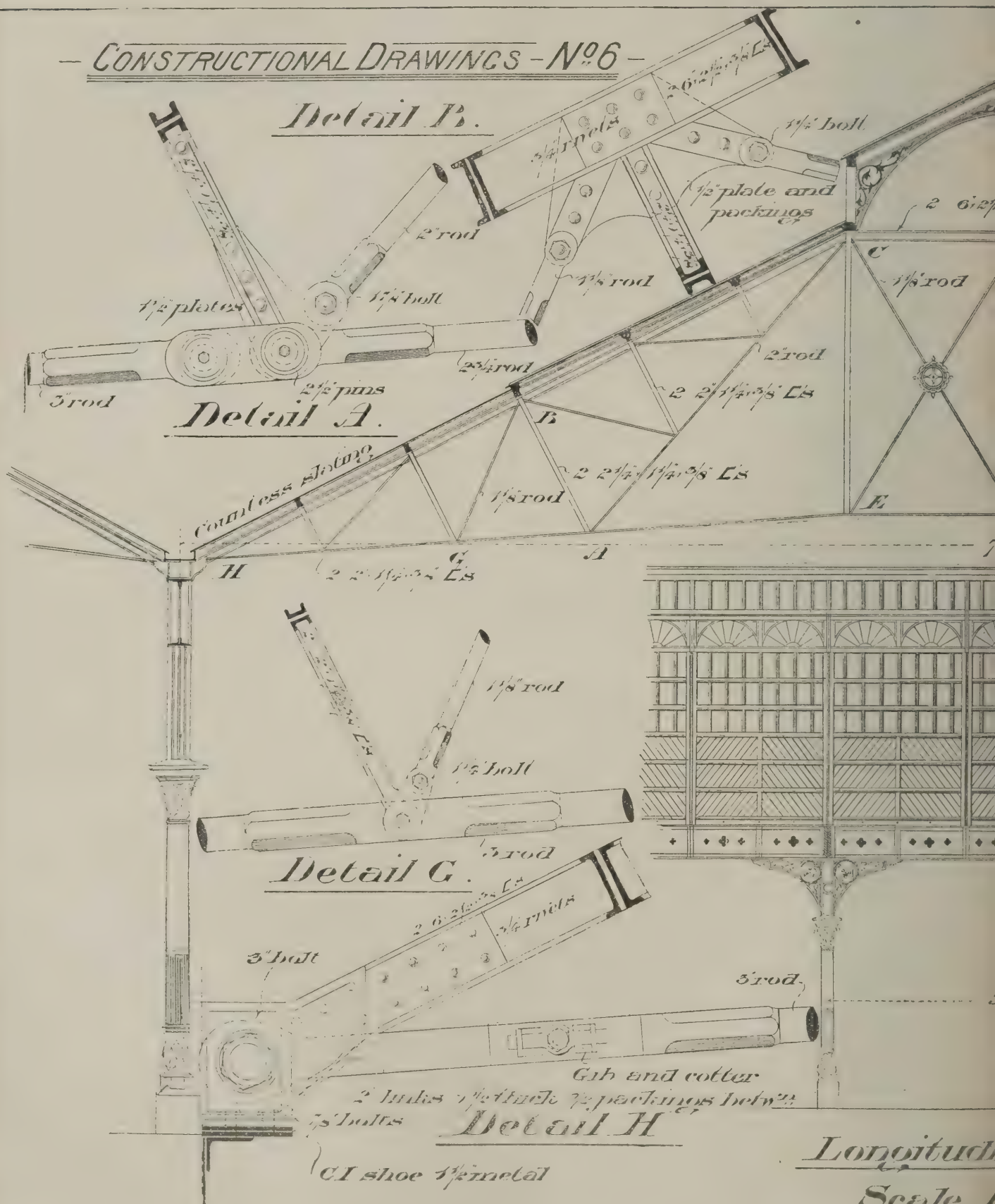
Mr. John Thomas Mulvany, C.E., formerly district engineer to the Board of Works in Ireland, has recently died at Kati Kati, New Zealand, aged 71. He was the last surviving son of the late Thomas J. Mulvany, R.H.A., of Dublin.

A brass tablet has been fixed on the staircase of the Whitechapel Free Library and Reading Rooms bearing the annexed inscription: "This tablet was placed by the Commissioners to commemorate the generosity of J. Passmore Edwards, Esq., in defraying the cost of erecting this building. 1892."

The external restoration of the Lady Chapel at the east end of Lichfield Cathedral is now approaching completion, after having been in hand for some years. The stonework has been renewed, and the stained-glass windows have been taken out and re-leaded. The niches, which originally contained figures, have now all been filled, the last three (by Mr. Ingram, London) having been put up this week. Mr. R. Bridgeman has carried out the restoration.

The improvement commissioners of Leek have resolved to advertise for competitive plans for dealing with the Red Lion property and the site available for a covered market, including early provision for a butter market, a premium of £25 to be offered for the selected plan, and £10 for that which in the opinion of the board is the second best.

CONSTRUCTIONAL DRAWINGS - N^o 6



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Stuart II Davies del

WAYSIDE NOTES.

THE autumnal meeting of the Iron and Steel Institute has been held this year at Liverpool, and commenced on Tuesday last, when Sir Frederick Abel, as President, addressed the members. One of the most interesting papers read at the meeting was that by Mr. T. H. Greathead, C.E., the engineer of the City and South of London Railway, dealing with the overhead railway now in course of construction at Liverpool. From this we learn that the railway when complete will be worked by electricity, many of the objections to the New York Overhead Railway being thus removed. The works are evidently now far advanced, since it is intended to open the line for traffic very shortly now—perhaps at Christmas.

The new railway—the first of its kind in this country—is composed almost entirely of wrought iron, the line traversing almost the whole length of the Liverpool Docks, a distance of about six miles. The railway consists generally of plate-iron girders, supported on channel iron columns, and carrying an iron flooring upon which the permanent way is laid direct, without the usual intervening ballast. The normal spans are 50ft., but some are 100ft. with girders of special construction. The columns are let into cast-iron sockets, bedded in and bolted to masses of concrete forming the foundation. Excepting in the case of some half-dozen spans, the line has been constructed without the use of scaffolding, and with very little interference with traffic. Fifteen stations are provided, and built upon iron girders and columns, the platforms being 115ft. in length by 12ft. wide, and 3ft. above the level of the rails, while access is gained from the street by four staircases. A train will consist of two carriages, each to seat 56 passengers, apparently answering somewhat to the description, so far as regards general arrangement, of the cars on the City and South London Railways. There will, however, be two classes. A loaded train is calculated to weigh 40 tons. The trains will be lighted by electricity, and fitted with the Westinghouse brake. A novel feature is a system of automatic signalling at all the intermediate stations (which, apparently, are to consist merely of platforms), the signals to be electrically worked by the trains themselves. The total cost of the line has been about £85,000 per mile.

Mr. Greathead says that there will be no more noise on this line than on any other railway. This is contrary to what one would suppose, considering the metal framework supporting the permanent way, which should suffer much vibration. Probably the noise will be more like that of a train upon a metal bridge. Anyhow, some of the Liverpool horses may at first raise objection to the new mode of aerial transit. I scarcely imagine the system will find great favour in this country.

The Inman steamers are in the near future to run from Southampton. Arrangements have been fully completed. In consideration of the benefit that the line will bring to the town, the South-Western Railway Company are getting the land for the new docks at a wonderfully cheap rate—nominal, in fact. The corporation have offered the company fifty acres of mudland at the rate of £20 per acre. Messrs. Lucas and Aird are to carry out the contract, and the firm commenced preliminary operations on Tuesday. As soon as the formal consent of the corporation has been received, the work will be pushed forward with the utmost despatch, the first Inman liner being expected to sail from Southampton in March. I understand that if this work of dock-making is completed as soon as is anticipated, it will stand out as a record of its kind.

Ship-building seems really to be at an extraordinarily low ebb. Only a few weeks ago I alluded to the state of the yards of some of the east-coast firms, and now fresh complaints come from Glasgow and the Clyde. On Monday last it was reported that out of 148 berths on the Clyde only 49 are occupied with ships in progress, while it was estimated that 5,000 men were idle. In Dumbarton the riveters—usually the best-paid workers in the trade—are offering themselves as labourers. Many have gone to Barrow, Belfast, and the east coast in search of employment; but, unfortunately, so many yards in these

places are also slack of work at the present time. There may be some slight relief to the Clyde firms now that two new steamers have been ordered for the Inman line. The vessels are to be of 9,000 tons each, and one will be built by Messrs. Napier, of Govan, and the other by Messrs. Denny Bros. and Co., Dumbarton. I trust that business may quickly mend with ship-builders; it is painful to think of so grand an industry in distress. Ship-building has frequently moved the poet to song. I cannot, by the bye, call to mind any such thing having occurred in connection with modern building proper, unless it has been in the A.A. *soirée* farces!

Bristol is anxious to establish a line of Transatlantic steamers. The town council held a sitting early this week to discuss a proposal to construct new docks at Avonmouth, together with a landing pier, to admit of Atlantic liners reaching the port at any state of the tide, and a railway along the quays, the whole at a cost of about £1,065,000. The situation of Avonmouth offers some advantages; but the Bristol Corporation would find it immensely difficult to get trade out of its old routes. An exceedingly bold move might be successful, but it would have to be very bold indeed. Milford Haven, again, has long been pointed out as the most suitable port for the arrival and departure of American steamers, and there is little doubt but that a bold spirit, with ingenuity and enormous capital, could establish a line of Transatlantic steamers there.

The Curriculum for Session 1892-93 of the Architectural Association has come to hand, and foreshadows a busy year for those who take part in the students' work, either as learners or instructors. It is compactly arranged, and not being of unwieldy size, students can without inconvenience keep it in their pockets ready for instant reference. The time-table serves to remind older members that the *Conversazione* will be held on Oct. 7, and the presidential address will be delivered at the annual general meeting on Oct. 21.

Mr. G. A. T. Middleton, the energetic secretary of the Society of Architects, delivers a series of lectures on "Architecture and Building" at the St. James's Hall, during the next three months. On Mondays, commencing Monday, Oct. 3, a series of ten lectures on "Architectural History and Ornament" will be given; and on Fridays, commencing Friday, Oct. 7, a course of ten lectures on "House Sanitation." The syllabus of the former shows a most interesting course of much value to students of architectural styles, and that of the latter embraces an exhaustive survey of sanitation and hygiene. The lectures will be delivered at 7 p.m., and those on architecture will be fully illustrated by limelight views.

GOTH.

THE ALHAMBRA ALTERATIONS AND DECORATIONS.

THE partial reconstruction of the Alhambra was entered upon eight weeks ago, and is now concluded, the theatre having been reopened this week. The grand circle balcony has been advanced several feet into the house, giving more seating room on the first tier, and greater space at the back. In redecorating the grand lounge and stalls, the Alhambresque style has been somewhat intentionally disregarded, in order to get a lighter effect. The whole of the decorative tone is therefore kept cream, white, and gold, with a little grey-blue to relieve it. The frieze above the mirror panelling is a heavy raised material, decorated specially for the work; the mirror panelling has been carried round the two ends of the circle to complete the whole. The ceiling has been levelled with fibrous plaster to hide the many girders which intersected it and caused a heavy, ugly appearance, and is now painted a light blue with gold stars. The fronts of the balconies and proscenium have been entirely redecorated, and the private boxes draped with amber brocatel. The iron columns are covered with raised gilded material, and the panels of the doors of the private boxes are filled with a similar material. The Foyer has also been redecorated in the same light manner. The five window spaces have been filled with Arabesque screens and stained glass, having electric lights behind them. But the great altera-

tion, as before mentioned, has been in the grand circle balcony, which has been advanced 6ft., giving additional seats and passage room, and a much improved view of the stage. The upper circle balcony and bar, on the second tier, and the two staircases have been renovated, whilst the grand circle staircase and entrance hall to private boxes and stalls have been redecorated. The theatre has been recarpeted and upholstered in colours and material to suit the general scheme, and a complete system of electric lighting, entirely new, introduced. The decorations are by Messrs. Campbell, Smith and Co. The plastic ornamentation is by Messrs. George Jackson and Son. The works have been carried on, under the supervision of the architects, Messrs. Clark and Pollard, without closing the theatre a single night.

CHIPS.

The Bridgewater highway board have appointed Mr. E. P. Batter, of Richmond, Surrey, as district surveyor, and Mr. H. C. Ransley, of Worthing, as assistant surveyor.

The new Wesleyan Church of St. John, in Langworthy-road, Weaste, Manchester, was opened on Friday. The church, school, and land have cost £6,600, and the sittings are for 700, against 300 sittings in the chapel now replaced.

Another step has been taken in the scheme of restoring St. John's Church, Perth, the congregation and minister having formally agreed to the removal of the galleries.

The tender for the erection of a large block of maltings, including a barley drying kiln, in Northgate, Newark, for Messrs. Gilstrap and Earp, has been taken by Messrs. Mackenzie and Son, King's-road, Newark. The amount is £22,000, which is the largest private undertaking yet begun in the town. The sub-contracts are:—Brickwork, Messrs. George Brown and Son; plumbing, Mr. S. Ironmonger; painting, Messrs. Harston and Son, all of Newark. The malting will be a 250 quarters steep. Messrs. Evans and Jolly are the architects.

The Crown Court and offices, Lancaster Castle, have just undergone considerable alteration and improvement at the hands of Mr. E. Howard Dawson, A.R.I.B.A., and Assoc. San. Inst., of Lancaster. To provide direct access from a new waiting room for witnesses to the court, one of the old Roman walls of the castle, 12ft. in thickness, had to be pierced. The principal work has been satisfactorily executed by Mr. Casson, joiner and cabinet maker, and Messrs. Seward and Co., plumbers, of Lancaster, at a cost of about £500.

A brine bath department is being added to the corporation public baths at Stafford, and the Turkish baths are being improved. Mr. C. J. Nevitt is the general contractor, and Messrs. Rudge and Griffith have supplied the baths and fittings.

Mr. F. H. Talloch, A.M.I.C.E., Local Government Inspector, held an inquiry at Bodmin, on Friday, respecting the application of the urban sanitary authority for permission to borrow £1,388 for works of street improvements and purposes of public walks and pleasure grounds. No objections were offered to the proposals, which were explained by the borough surveyor, Mr. J. Oliver, and by the town clerk.

The parish church (St. David's) within the precincts of old Llanthony Priory is to be restored. Mr. J. James Spencer, of Abergavenny, is the architect.

New schools are about to be added to the Congregational church in Wood-street, High Barnet. The contractor is Mr. S. F. Holliday, of Stamford, and the cost will be about £1,000.

The sum of £800 has been raised for a memorial in Peterborough Cathedral to Dr. Magee, the late Archbishop of York, and the committee have accepted the design of Mr. John L. Pearson, R.A., for the cenotaph. The sculptor commissioned to execute the memorial is Mr. James Foreyth, of Hampstead.

A north wing is being added to the County General Infirmary at Stafford, from the plans of Mr. Aston Webb, of London. The elevation harmonises with the older part of the institution, but is raised on low arches. Mr. F. Espley is the contractor, and Mr. H. T. Peabworth the clerk of works.

Memorial-stones of a Wesleyan chapel were laid at the corner of Willoughby and Hampden roads, Hornsey, on the 15th inst. The building will be Early English in style, and built of red bricks with stone dressings. Mr. Robert Curwen, of Palmerston-buildings, is the architect. In addition to the chapel, which will seat nearly 1,000 persons, are to be built an infants' class-room, additional vestries, and a chapel-keeper's house; the whole group being estimated to cost £6,000.



RESIDENCE AT CATTON, NEAR NORWICH.

THIS house, with stables and carriage-house at the rear, has just been erected for Mr. A. W. Bell by Mr. J. Evans, builder, of Norwich and South Walsham, from designs and under the supervision of Mr. Albert C. Havers, architect, Norwich. The house faces the high road to Norwich, and commands extensive views of the city. The ceilings of the dining and breakfast-rooms are panelled in plaster. There are altogether eight bedrooms, with two dressing-rooms, bath-room, and w.c., &c.

AN EXHIBITION OF ARCHITECTURAL PHOTOGRAPHS.

THE series of Somersetshire photographs opened yesterday by Mr. J. L. Robinson, R.H.A., at the Royal Architectural Museum, Tufton-street, Westminster, enables the visitor to see wherein the rich screens and elaborate bench-ends, with other woodwork in the churches of the Taunton district, contrast, rather than compete, with the, perhaps, finer, and, in some respects, more satisfactory specimens of the same date and character to be found in Norfolk and Suffolk, more particularly near King's Lynn and away in the country about Norwich. West Somerset is by no means so wealthy in mansions of historic interest as the country round Yeovil, or even nearer Wells. Indeed, the beauty of the Ex-moor scenery and the grandeur of the Quantocks must be reckoned as the chief attractions of West Somerset. Old Cleve Abbey, of which Mr. Robinson shows some nine or ten pictures, is, of course, in its way almost unique, and is certainly a most delightful example of typical English monastic architecture in many respects unsurpassed elsewhere. The convent garden side of the refectory figures to an enlarged scale in print 39, being much from the same point of view as the sketch published in our pages on August 19th last. Two of the most admirable prints from this place here given are 71 and 74. The first shows a magnificent old tree leafless and dead

by the side of an equally fine specimen in full foliage. The second gives a sketch of the "Holy Rood Water," with cattle cooling themselves in the stream. Dunster is represented well by photographs 7, 8, 9, and 10, also by 65 and 66 in the smaller series. Nothing could be better than Mr. Robinson's sheet of the great screen at the parish church, with its wonderfully intricate carvings on the main cornice over the vaulting supporting the loft. The side screen, too, leading to the south aisle of the choir is exquisitely rendered. The Yarn Market in views 10 and 37 makes a capital picture. Two other successful enlargements are 40 and 40A of the interior of East Quantoxhead Church, illustrating the pulpit, screen and pewing in useful and suggestive detail. The interior of St. Decuman's Church, as we already have said when describing the Architectural Association excursion visits in particular last month, is especially noticeable for its barrel-vaulted roofs, which have singularly pretty cornices and ribs. No. 38 as here enlarged carefully depicts part of these; but they do not surpass for excellence of workmanship such church roofs as those at Knapton and Mildenhall in East Anglia. No. 60 gives a general view of the nave and chancel. The towers of St. Mary's Taunton, Ruishton, Bishop's Lydeard, Kingston St. Mary, and Staple Fitz Payne are all done justice to in the best style and from the best points of view. Minehead supplies first rate and useful details in the prints 59 to 63, those of the font, chest in vestry, and Jacobean altar table being specially worth notice. Spaxton and Blackmoor farms, Combe, Sydenham, and Cothelstone manor houses, Nettlecombe Court and East Quantoxhead are among the houses which are here so well recorded. For successful photography the staircase of the last named building may be here singled out for reference. Creech St. Michael makes quite an artistic picture (No. 6), while the pulpits in the stocks under the ancient yew tree in the same churchyard (No. 58) show how far architects can sink in the social scale from all appearances. Bridgewater church comes out well in prints 76 and 77, and Poundisford Park is done justice to by Nos. 4, 53, 54, and 55. That of the old

lead tank next the entrance is simply a perfect sun print, with the two water drinkers giving the cistern scale. Bishop's Hull supplies pretty pictures, and the large groups from Cannington leave nothing to be desired, giving the best possible results with the material available. Chard supplies some of the best subjects in this series of pictures, such as the Chough Inn, the old Guildhall where Judge Jeffreys extended mercy! the Grammar School, and other houses with their quaint old porches in the High-street. The views, too, in the churchyard are worth seeing. Ilminster, which has a fine but very Late church with a central tower of the type of St. Cuthbert's at Wells, is a very interesting and cathedral-like building (125, 126, 127), and as Mr. Robinson visited Wells on leaving Taunton, the present series includes several views from that exquisite cathedral. Nos. 29 to 34 furnish large pictures, and 128 to 131 smaller ones. That of the market place is particularly charming, and so is the view of the cloisters and western tower. No. 133 shows the courier of the party, who has a face like a Gothic gargoyle. The exhibition will remain open at the Museum till the occasion of the A.A. opening conversazione early in October.

Mr. Ernest A. B. Woodward, for the past 13 years of the water engineer's department, St. Helen's, Lancs., who was recently appointed water engineer for the Wolverhampton county borough, was on Friday night the recipient of a testimonial from the officials at St. Helen's Town Hall. The testimonial took the form of 23 valuable works on water engineering, building construction, and similar subjects, each bearing a suitable inscription.

A new Free Presbyterian church is about to be built in Morningside-road, Edinburgh, from plans by Mr. Hippolyte J. Blanc, A.R.S.A. The church will be Renaissance in style, and will cover an area of 98ft. by 50ft., internal measurements. It will have shallow galleries on three sides. Behind the main building will be a hall, children's class-room, vestry, session-room, and caretaker's house. The church will afford accommodation for upwards of 800 sitters, while the hall will be seated for from 200 to 800. On one side of the elevation a campanile tower will eventually be carried to a height of 180ft. The total cost will be about £8,000.

Building Intelligence.

GUILDFORD.—The foundation stone of the new borough police-station in North-street, Guildford, was laid by the Mayor on Wednesday week. The building will be in the Classic style, with separate entrances to the police-station, the superintendent's house, and the private apartments. The front of the building will be of Portland stone and red brick. On the ground floor will be a charge-room, public office, superintendent's private office, and a small room for the weights and measures department. The ten cells, which will be lined with glazed bricks, and the constables' room are to be in the rear, from which a passage of about 100ft. long will communicate with the town-hall. Prisoners will be conducted along this passage, which passes beneath the jury box into the dock. On the first and second floors of the building will be the superintendent's private house, with apartments for a married constable in the rear. The contract for the buildings is for £5,775, and the works, which commenced in May of the present year, are to be completed by March 25, 1893. Mr. William G. Lower, of Guildford, is the architect, and Mr. Robert Wood the builder.

PATRICROFT.—The guardians of the Barton-upon-Irwell Union some time ago purchased the old mills belonging to the Messrs. Waddingtons, which adjoined the present workhouse, and, having made arrangements to erect the new buildings by instalment, have let the contract for the largest portion of the buildings, for aged and infirm pavilions for the administration buildings on Wednesday week, to Messrs. Southern and Sons, by public competition, for the sum of £16,250. When these pavilions are completed, they will be temporarily occupied by the inmates now in the hospital until the new building for them is erected upon the site of the old hospital buildings. The total accommodation, when completed, will be for about 500 inmates. Messrs. Mangnall and Littlewoods, of Manchester, are the architects, whose plans were recommended by the Local Board from competition designs by several architects.

SHEFFIELD.—New printing and publishing offices have just been completed for the proprietors of the *Sheffield Independent*. The style adopted is a free treatment of Early French Renaissance, and the building is faced with Huddersfield stone. The building is T-shaped on plan, the head, next Fargate, being utilised as shops and offices, and the tail as printing works, six floors in height. Messrs. Flockton and Gibbs, of Sheffield, were the architects, Mr. R. Hoskin, of Sheffield, was the consulting engineer, Messrs. William Ives and Co., of Shipley, were the general contractors, and Mr. George Malpass was the clerk of works.

SMALL HEATH, BIRMINGHAM.—The foundation stone of a permanent church of St. Oswald was laid on Saturday at Small Heath, near Bordesley. The present iron church, which will hereafter be utilised as a school, seats about 260, and it is proposed to erect a church of brick and stone, with 620 sittings. The architect is Mr. W. H. Bidlake, M.A., of Birmingham, and the church will consist of a chancel, a nave, and aisles of six bays. On the north side of the chancel there will be an organ chamber and clergy vestry, and on the south side will be a transept and the choir vestry, the two vestries being connected by a passage behind the altar. The walls will be finished in Leicester sand-brick, with Bath stone dressings; the nave piers will be of Hollington stone, and the roof will be tiled. The style adopted is that of the Transition from Early English to Geometrical Decorated. The portion of the work at present undertaken consists of the whole of the east end and four bays of the nave and aisles, with a temporary west front. The design provides also for the erection, by-and-by, of a tower and spire. The builder is Mr. T. Rowbotham, of Small Heath, and the estimate is £4,823. The portion of the church now being built will accommodate 460 worshippers.

WEST HAMSTEAD.—A new synagogue in West End-lane was opened on Saturday. It has been built by Messrs. John Allen and Sons, from the designs of the architect, Mr. Delissa Joseph, of Basinghall-street, E.C. The principal elevation, which is Romanesque in character, has been carried out in red brick and red stone, and comprises a great central tower flanked by secondary

towers, containing the staircases. The building has been planned upon a spacious scale, and is provided with seven exits, all the doors of which open outwards. The main building is in the form of an octagon, the corners of which are occupied by columns carrying the gallery, and from the tops of the columns spring the ribs which form the dome, which is constructed of steel. The gallery is placed in the aisles, which follow the lines of the octagon. The ark, which is in the form of a domed temple, is placed in an apse recessed from the eastern side of the octagon. The choir is at the back of the ark, the voices reaching the synagogue through wrought-iron grilles. Immediately in front of the ark platform is the reader's platform, reached by two staircases, describing quarter-circles, the pulpit being in front of the reader's platform, the whole of the arrangement being new to London. Cloak-room accommodation is provided at each level. The scheme of decoration is pure white throughout. The building is lighted by two ranges of windows and by clerestory lights. The capacity of the building is for 656 sittings, and it has cost £11,000. We illustrated the synagogue by a plan, and exterior and interior views, in the *BUILDING NEWS* for Dec. 11, 1891.

COMPETITIONS.

MANCHESTER.—The Manchester school board have selected in competition plans for four new schools, and have appointed their authors as architects. They are: For the Cheetham Higher Grade School, Messrs. Royle and Bennett; for the Ardwick Higher Grade School, Messrs. Maxwell and Tuke; for the Openshaw School, Mr. H. E. Stelfox; and for the Burgess-street Infants' School, Messrs. Preston and Vaughan.

NEW CHAPEL, GORING, OXON.—In a limited competition for building a new chapel at Goring, the designs by Messrs. Cooper and Howell, of Blagrove-street, Reading, were unanimously chosen. They have been instructed to proceed with the work.

SOUTH SHIELDS.—The name of the assessor in the South Shields Board School competition should have been given by us on p. 384 last week as Mr. William Landless, of Belmont-grove, Clarendon-road, Leeds.

SHEFFIELD.—At a meeting of the Abbeydale church extension committee, held on the 14th inst., Mr. Ewan Christian's report as assessor was read on the plans submitted in competition for the new church. The committee chose the plans of Mr. Joseph Norton, of St. Philip's-road, Sheffield, which had been favourably mentioned by Mr. Christian. The new church is to provide seating accommodation for 730 people. It will be built of stone, Early English in style, and will cost £6,000. The site was purchased some time ago, and an iron mission church stands on the ground which will eventually be occupied by the more substantial structure. Already the sum of £2,000 has been raised towards the cost of the building.

CHIPS.

As memorials of the Raimes family, an oak pulpit, lectern, and prayer-desk, treated in the Decorated style, have been placed in the church of St. Helen at Wheldrake, near York. The work is the production of Mr. J. Roddis, of Birmingham.

William Troman, builder and contractor, of Old Hill, near Birmingham, committed suicide on the 15th inst., by hanging himself in his carpenter's shop. Deceased was about forty-five years of age, and leaves a widow and four children. At the inquest it was shown that he was greatly harassed by pecuniary troubles, and a verdict of suicide whilst suffering from temporary insanity was returned.

St. Dunstan's-in-the-West in Fleet-street was reopened last week after internal decoration, carried out by Messrs. Campbell Smith and Co.

The foundation-stone of Church schools at Ladock, near Grampound Road, Cornwall, was laid last week. Mr. F. W. McCoskrie is the architect, and Mr. John Crocker the builder.

Mr. S. J. Smith, Local Government Board Inspector, opened an inquiry on Tuesday at Manchester respecting an application by the Corporation to borrow £60,000 to purchase Rampton Manor Estate, Nottingham. The estate, if purchased, is to be used for the treatment of a portion of the Manchester sewage. The application was opposed by the local authorities of Retford and other places.

Engineering Notes.

THE TOTTENHAM AND FOREST GATE RAILWAY.—This important suburban junction line, the joint undertaking of the Midland and London, Tilbury, and Southend Railway Companies, is in course of construction. The line, which is six miles four chains in length, commences by a junction with the Tottenham and Hampstead Railway at the South Tottenham Station, and passes between the great reservoirs of the East London Water Company, into Walthamstow. It is then carried through Leyton, Wanstead, West Ham, and East Ham, finally making a junction with the Tilbury line at Forest Gate near Romford-road. The line passes through a populous district, which necessitates the demolition of 343 houses, and as one-fifth of these were artisans' dwellings, the company has had to build 70 new houses under the clauses of the Act of Parliament providing for the rehousing of the working classes. The line also passes through the grounds of five old Essex mansions, four of those formerly occupied by City merchants, and the fifth the Royal Lodge at Leytonstone. The short line crosses so many streets and roads that there are 72 steel bridges, absorbing about 4,000 tons of Siemens-Martin steel. Of these bridges 15 are over and 57 under bridges of various spans and types, no two being alike, while most of them are skew bridges. The line for about half its length is carried on embankment and in cutting, but three miles of it consists of a viaduct of brickwork arches each of 30ft. span. The gradients throughout are easy, and the curves good. Concrete is largely used in construction, especially in the retaining walls. There will be five passenger stations, and four goods and coal depots on the line. The stations will be at Black Horse-road and Shrubland-road, Walthamstow, respectively; Leyton High-road, Leytonstone High-road, and Wood Grange-road, Forest Gate. The construction involved 81,894 cubic yards of brickwork, about 4,000 tons of steel and ironwork, exclusive of rails and permanent way, and over 300,000 cubic yards of excavation. The contract amount is £264,422, exclusive of station buildings. Nearly 1,000 hands are engaged on the works, together with four locomotives and a number of steam cranes. The engineer of the railway is Mr. Arthur C. Pain, M.Inst.C.E., of Westminster, the resident engineer being Mr. Arthur Nunn. The contractors are Messrs. Lucas and Aird, whose agent on the works is Mr. Henry Turner. The line will be open for traffic in September, 1893.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

GLASGOW ARCHITECTURAL ASSOCIATION.—A visit was paid on Saturday by a party of the members to Mugdock and Bardowie Castles, by kind permission of the occupiers. A meeting was held in the Rooms, 114, West Campbell-street, on Tuesday evening, the president in the chair. Mr. Wm. Fraser, A.R.I.B.A., read a paper on "Domes, and their Construction." After running over general points of construction, he noted the chief features of interest in the following well-known domes—viz., the Pantheon, St. Sophia, the Duomo, Florence, and St. Paul's, London. Mr. Robertson opened the discussion which followed.

St. Paul's Church, Caerfallwch, near Rhosessmor, was reopened last week after restoration and refurbishing. The structural repairs were executed by Mr. Alfred Lloyd, contractor, Flint, and the internal decorations by Mr. Foulkes, Mold, all the details of the work having been designed and superintended by Mr. Douglas, architect, Chester. The committee also provided new seats for the chancel and nave, which were supplied by Mr. R. Edwards, contractor, Mold.

Lord Crewe unveiled, on Monday, and formally presented to the town of Sandbach a fountain, which he had caused to be built at a cost of £350. The fountain, which has been erected in the centre of the town and is raised on steps of Yorkshire stone, has a pedestal of marble for the centre basin, and a fountain jet surrounded by four basins. The structure is circular in plan, is in the Jacobean style, and has carved in it the coat of arms of the Crewe family. The fountain was designed by Mr. Bowyer, architect, of Nantwich, and the work has been carried out by Mr. John Stringer, builder, Sandbach.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 832, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

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ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two the minimum charge being 5s. for four lines.

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The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and SIXPENCE for every eight words after. All Situation Advertisements must be prepaid.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL, XLI, XLII, XLIII, XLIV, XLV, XLVI, XLVII, XLVIII, XLIX, L, LI, LII, LIV, LVIII, LIX, LX, LXI, and LXII may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—G. M. and Co.—Ralph.—A. S. R.—M. T.—Plantagenet.—R. and B. G. Co.—T. (Newbury).

Correspondence.

EAST LANGDON CHURCH.

To the Editor of the BUILDING NEWS.

SIR,—I have read, on my return to town, your interesting note with respect to the two ancient windows which we discovered at East Langdon Church during the recent reparation which I have had carried out. Their form is not different from what is usually classed as Norman work—a round-headed narrow light deeply splayed inside—and there is nothing distinctive of Saxon date in this respect; but their jambs appeared to be formed of rough flints, as well as they could be examined, and not of quoins, as might be expected, since all other Norman portions of the church have them, and, in addition, one of them was found to be cut through by an Early Norman arcade. It had been a south window of an aisleless nave, certainly of older date than the added Norman aisle. This arcade, by the way, was swept away at the beginning of this century, and one of our works has been to replace it. The windows, it may be just possible, belonged to a Norman church still earlier than the arcade, but the most probable belief is that they are really of Saxon date. It may be remembered that windows of similar form have been found under similar circumstances, cut through by Early Norman work, at Avebury, in Wilts, and at Iwer, in Bucks, and a Saxon date has been pretty generally assigned to them.

Your remarks with regard to Saxon work in Kent are of interest, and your readers who may care to search will find a good deal of Saxon work in small detached portions, especially in the churches of East Kent, but only plain walling, as at Swancombe, which you refer to, with very little of the usual features of Saxon work, will be

met with, and mostly of materials taken from Ancient Roman buildings. But at Whitwell Church, close to East Langdon, will be found the most complete specimen of Saxon work in Kent, known to me, and which I believe to be of very Early Saxon work. It is a plain building with nave and a small square chancel, with a continuous north aisle. The walls are lofty for the width, the quoins are rough flints, and they remain at almost all the angles. There is a blocked west door of rude flint-work, a stone window in the gable, and a south window with double splay. The chancel arch is much out of shape, and it is of the same early date as the church.—I am, &c., E. P. LOFTUS BROCK.

BRITISH LIBRARY PLANS FOR EXHIBITION AT CHICAGO.

SIR,—I have been requested by the Chairman of the Library Architecture Committee of the Chicago Exhibition to form a collection of British library plans, to be shown in conjunction with a large exhibition of library appliances in 1893, and I take the liberty of inviting contributions from architects who have designed library buildings in this country. The exhibit of plans is intended to be as practical as possible, and for this reason only floor-plans, showing existing arrangements of shelving, tables, counters, racks, &c., are desired. It is therefore suggested that floor-plans, drawn to a $\frac{1}{4}$ in. scale, be sent, and that only the part of the library used for work be shown. This may, however, include museums or art schools where worked along with the library. Photographs or drawings of elevations may also be sent, if thought necessary; and any point which may be considered new or uncommon in regard to construction or arrangement might fitly be emphasised. It is intended to publish a report on the library plans represented at the exhibition, and the hope is entertained that the results of such a great international collection may be preserved in a manner likely to prove of the utmost possible use in the future. All plans proposed to be shown should reach me not later than Christmas next, and I shall arrange to have them carefully packed for free transmission to Chicago. Any further information will gladly be given by me at the under-mentioned address.—I am, &c., JAMES D. BROWN, Librarian. Clerkenwell Public Library, London, E.C.

[It would be well to arrange, if possible, for a short exhibition of the collection here in London before they go to Chicago.—Ed. "B.N."]

LAND SURVEYING.

SIR,—This time it is "Northman" who has seized on a slip in my reading off the diagram in my last letter. Of course, $EF - Ef =$ about $\frac{2}{3}(MF - Mf)$, not $YA - Ya$. $EF - Ef =$ about $\frac{2}{3}(YA - Ya)$. The diagram was not an entirely new case; it was intended to represent the lower half of Fig. 5. The usual way to calculate the amount of alteration of the length of one object whose length depends on another object whose length varies is to take the alteration when motion is just beginning, in which case Mf is (within the limit) parallel to Ya . Perhaps it will be better to take the exact figures given in "Northman's" letter of July 15th. BA is measured 1,530 links, instead of 1,570 links, a difference of 40 links in FA . The check line YA shows a difference of 25 links, while the check-line given in Fig. 5, EF , will show a difference of 7 links. I have already said that I consider this to be ample to show that an error existed, and that taking the line to the point F saved work. I am supported in the view that a cross line such as EF is sufficient check on a triangle by Messrs. Merrett and Uaill and Baker.

I did not give any exact dimensions or "proof" of the check of DB by AF in Fig. 4, as the matter seemed obvious; however, if DB is chained 40 links out, AF will show a difference of 22 links. I have taken the scale of Fig. 5 at 5 chains to an inch.—I am, &c., Gravesend, Sept. 20th. G. W. COBHAM.

DURHAM COLLEGE OF SCIENCE.

SIR,—My attention has been called to a notice of this building in your impression of the 12th ult. I am sure you will allow me to make a slight correction in the description—viz., the drawings for the continuation of these buildings were prepared by the late Mr. Johnson and myself as joint architects, and since the death of Mr. Johnson, a few months ago, the work has been entirely in my hands.—I am, &c., FRANK W. RICH. 5, Eldon-square, Newcastle-on-Tyne, Sept. 15.

Intercommunication.

QUESTIONS.

[10857].—Testing Drains.—Will some reader kindly give me information as to the best way to test old drains?—SWEET GAS.

[10858].—Tar Pavements.—Would any of your correspondents kindly give me the best method of forming the tar pavements in the playgrounds of large School Board schools? I find there is considerable diversity of opinion as to whether the material should be used fresh, or turned over a certain number of times before use. Any information which may either alter or confirm my present views upon the matter, would greatly oblige, and, in order to save time, might I ask for a reply as below, as well as through the columns of the BUILDING NEWS?—J. M. BOTTOMLEY, Architect, Middlesbrough.

[10859].—Hopton Wood Stone.—Can any reader oblige me with his experience of Hopton Wood stone for outside use, monumental or other, in respect to weathering qualities?—W. R.

CHIPS.

The foundation-stone of a new Roman Catholic church which is being erected on land near High Park-road, Smethwick, was laid by Bishop Ilsey, of Birmingham, on the 16th inst. The church will accommodate between 300 and 400 persons.

The new additions to the workhouse, Great Yarmouth, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

The council of the Royal Scottish Academy have resolved to revert to the old date for their annual exhibitions. The next exhibition of the Royal Scottish Academy will be held, not at Christmas as last year, but in the month of February next.

The erection of a tower and porch to complete SS. Mary and John, Cowley-road, Oxford, has been begun. The architect is Mr. Mardon Mowbray, of Oxford. An anonymous donor has given £2,000 towards the cost of the work.

The first sod of the new Roman Catholic College at Blairs, Aberdeen, was recently cut by Archbishop Macdonald. It will consist of three sides of a quadrangle, and the buildings will be entirely faced with local granite. Messrs. Ellis and Wilson, of Aberdeen, are the architects, and the outlay will be £20,000.

The reformatory at Kingswood, near Bristol, was reopened by Lord Norton on the 14th inst. after having been entirely reconstructed from plans by Mr. Hirst, of Bristol.

The whole of the carvings of the Bishop's throne in Peterborough Cathedral has now been completed and the figures placed in position. At the sides of the seat are representations of St. Peter and St. Paul. On the back board are symbolical representations of temperance, wisdom, fortitude, and justice.

The foundation stones of a new Sunday-school at Potter's-green were laid last week. The school, which will cost about £320, and accommodate 180 children, will be 38ft. by 24ft. The builders are Messrs. Kelley and Son, of Foleshill.

The north-easterly extension of the Leeds Railway will be commenced next month. The contract for the tunnel from Wellington Station to Marsh-lane has been let for £150,000.

An ice factory has been built in Dover-road, Folkestone, and has been started this week. Mr. Joseph Gardner was the architect, and Messrs. Petts and Son, also of Folkestone, were the contractors.

The Heatherdene convalescent home for children in Wetherby-lane, Harrogate, was opened on the 15th inst. It commemorates the fatal accident of June 16, 1886, at the Victoria Hall, Sunderland, and has been built from plans by Mr. John Eltrington, of Sunderland.

A new sea wall is about to be built at Teignmouth at a cost of about £1,250. Mr. Marcus Bridgman, of Torquay, is the contractor.

The Bristol Town Council held a sitting on Tuesday to discuss the proposal of the Docks Board to construct new docks at Avonmouth, together with a landing pier, to admit of Atlantic liners reaching the port at any state of the tide, and a scheme for a railway along the quays, the whole to cost about £1,065,000. Decision was postponed for a week.

The widow of the late Mr. John Clement Mead, architect, died on Saturday at her son's residence, Balcombe Rectory, having reached the advanced age of 97 years.

Among the adjudications in bankruptcy in Tuesday's *London Gazette*, the name appears of W. Macie Leir Seaman, of Victoria-street, Westminster, architect.

The rich screens in the parish church of South Pool, Devon, have just been restored by Messrs. Harry Hems and Sons, of Exeter.

Legal.

WHAT IS A "BUILDING"?

THIS is a question that still frequently comes up for decision in the Courts under the clause in the Building Act of 1855. Perhaps the question should rather be put as: What ought to be a building?—i.e., what sort of structure ought to be built up of walls of brick or stone with a slate or tile roof and proper foundations, instead of being put together with timber? The last case of the kind was certainly a bold attempt to evade the statute, and it is satisfactory to note that the district surveyor succeeded in his summons to the North London Police-court. The structure in dispute was a large erection, part shop and part timber stage, near Dalston Junction. The defendant's case was that, being merely a timber stage, it could not be a "building" within the Act. But from the evidence it appeared that the structure is 17ft. wide, 42ft. long, and 32ft. high. It stands upon timbers for a foundation, and has revolving shutters at the lower portion, and in these are retailed, besides lengths of timber, various wooden manufactured goods, such as step ladders, cornice poles, meat safes, &c.

The magistrate went into the facts, and pointed out that each case must be decided upon its merits. He was not going to hold that all timber stages were buildings. But this was a good deal more than a timber stage, for it was permanently used as a shop, and even had revolving shutters in front for that purpose. It is true the sides of the structure were left open, but that was really done for the convenience of its owner, and did not in the least degree alter the fact that the structure in its lower portion was used and occupied as a shop, and that permanently. More than this, the structure was in the High-street, Kingsland, and so it abutted upon houses and shops in which many people resided. So the order was made that the requirements of the district surveyor be complied with, and thus the ingenious argument that this wooden stage and shop over 30ft. high did not come within the Act as a building has, so far, failed. It is obvious that an exemption of this kind can never have been intended if the Act is to be construed in any reasonable way for the protection of adjoining owners and occupiers.

FRED WETHERFIELD, Solicitor.
1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

CONSIDERATION.—BUILDING.—ARCHITECT'S AGREEMENT.—The whole question is one of fact whether, and to what extent, the original agreement or undertaking was added to by a new and verbal agreement made since. If it can be shown by A. that, as regards the extras and extra charges, B. made such a fresh agreement by, in fact, adding to the old one, this could be gone into in an action for the balance owing.

APPEAL.—LAND.—AGENT.—COMMISSION.—This commission was not really earned until the purchase was completed. There has been no completion. You have been paid part of your commission out of the deposit, and are, so far, fortunate. But I cannot see any legal ground upon which it is possible to claim anything further.

FRONTAGE.—PARTY-WALL.—ROAD.—1. Yes, such an order can be made if the case comes within Section 7 of the Metropolitan Building Act Amendment Act, 1878, which consult. 2. The Act says as to party-walls that the building owner must give the adjoining owner "at the least three months' previous notice," and there is nothing to provide that the work must be begun immediately upon the expiration of that notice or at any special time thereafter.

Lord Lathom has consented to lay the foundation-stone of the Cross Doaf and Dumb School for North and East Lancashire, at Blackburn, on Saturday, October 1, with Masonic honours.

During the past week two memorial windows have been placed in the north aisle of St. Mary's Church, Lichfield. The first window represents the Adoration, and the second the Annunciation. Both are the work of Mr. C. E. Kemp, of London.

The parish church of St. John the Evangelist, of Hipswell, in the North Riding, which was rebuilt in 1811, was reopened on Wednesday week after restoration from plans by Mr. C. Hodgson Fowler, F.S.A., of Durham. The building has been reroofed, the walls repointed, two new windows opened out, new stone terminal crosses erected, and the chancel has been rebuilt to a larger scale. Mr. H. Harwood, of Mansfield, near Darlington, was the contractor.

LEGAL INTELLIGENCE.

DAMAGES FOR EXTRAORDINARY TRAFFIC.—On Saturday, at the Preston County Police Court, Messrs. John Watt and John Wilson, of Glasgow, contractors for the Elston portion of the Thirlmere water scheme of the Manchester Corporation, were summoned under the Highway and Locomotives Act by the authorities of Elston for £86, alleged damage to the roads in that township by extraordinary traffic. Counsel for plaintiffs stated that the average yearly cost of repairing the length of road referred to had been £11 18s.; but in 1891, after the work commenced, the cost had increased to £44 12s. 6d., and so far as the present year had gone £65 6s. 5d. had already been expended. The sum claimed represented the difference between the average mentioned and the increased cost, and the highway rate had been increased from 2d. to 1s.—Mr. W. Dagger, the highway surveyor, supported the case, and Mr. B. Sykes said the claim was at the rate of 3d. a running yard for 1891 and 4d. for 1892, but it would cost fully 1s. a yard. The Bench ordered the payment of £80 and costs.

PENALTY OF DEPARTING FROM THE SPECIFICATION.—At the Chester County Court, on the 15th inst., before Sir Horatio Lloyd, an action was brought by John Jones, joiner and builder, against William Cooper, joiner, for £35 11s. 4d., balance of account owing in respect of two houses built for £410 with certain extras. Defendant lodged a counter-claim for damages in respect of loss sustained through plaintiff not keeping within the terms of the contract. The defendant admitted liability to pay a portion of the balance, but stated that the building had not been erected according to contract. His Honour, in giving judgment, said that it was clear that plaintiff had omitted to put under all the walls a foundation of concrete 2ft. thick, as he had agreed to do under the contract. The amount due to defendant on the counter-claim would exceed that on the claim, therefore he should give judgment on the claim for the defendant, the plaintiff by his conduct in departing from the specification having absolutely precluded himself from any right to claim.

A SWINDLER OF TIMEKEEPERS.—In August last a man named Humphreys was convicted at the Central Criminal Court, before Mr. Commissioner Kerr, for obtaining money by false pretences, and his lordship then expressed the belief that the accused had been the dupe of an individual named George Wilson. That man was subsequently apprehended, and he pleaded guilty on Wednesday week to an indictment charging him with having obtained two sums of £250 with intent to defraud. It was explained that the prisoner had advertised for timekeepers, representing himself as a builder, and the applicants were asked to deposit as security £250. In two cases this amount was obtained, and in other instances smaller deposits were given. The applicants, having made the required deposit, discovered that the representations of the prisoner were false, and that there was no *bona fide* employment, but they failed, however, to recover their money. The deception was a cruel one, because the victims in each case had parted with the savings of a lifetime. For the defence it was urged that the building operations in which the accused was engaged would have been carried out but for the fact that a mortgage had been foreclosed, but counsel for the prosecution declared that Wilson had been connected with frauds of the same description for a number of years. The Commissioner, remarking that the prisoner's conduct had been heartless, sentenced him to three years' penal servitude.

TOLLY V. BLACK.—On Tuesday, the 20th instant, at Greenwich Police-court, Mr. Kennedy gave his decision on this case. On the first point, as to whether the premises were one building or two buildings, Mr. Kennedy decided that they were two buildings, and made an order for the erection of a party wall between them. On the second point, as to whether the upper portion of the wall between Nos. 24 and 26 was a party-wall or external wall, it was decided that it was an external wall, and no order was made thereon.

IN RE A. FOSTER, OF EAST GRINSTEAD.—A statement of the affairs of Alfred Foster, builder and contractor, of East Grinstead, has been issued. The debtor obtained his discharge from a previous bankruptcy in 1884, and his gross liabilities are now given as £24,350. The debtor's estimated liabilities are £16,674, and the assets £1,908, leaving a deficiency of £11,766. At the date of the receiving order the debtor had had over-drafts from a bank to the amount of £15,473 14s.

IN RE J. W. HOBBS AND CO.—An application was made to Mr. Justice Barnes on Wednesday by Mr. Marten, Q.C., on behalf of creditors that this firm of builders should be wound up. Mr. John Chester applied on behalf of the American Elevator Company, who had also lodged a petition for the carriage of the order. He said that his clients' claim was for £32,000, which was secured by mortgages. The builders were the builders of Whitehall-court and of the large flats recently built near the French

Embassy, and called Hyde Park-court. Mr. Ford supported the petition on behalf of the Kensington Electric Lighting Company, who had arranged to light the buildings. Mr. Brodie Cooper and Mr. Eldridge also appeared. A winding-up order was made.

WATER SUPPLY AND SANITARY MATTERS.

CARDIFF.—The works for the better supply of water to Cardiff were completed by the admission of water to the town from the Cantrefr Reservoir on Tuesday week. The corporation acquired the undertaking of the Cardiff Waterworks Company in 1878, and in 1881 instructed Mr. J. A. B. Williams to report on every source of water supply available for Cardiff. Mr. Williams recommended the extension of the Ely pumping station as an immediate means of obtaining an increased supply; the construction of a storage reservoir at Llanishen, adjoining the Llysane reservoir, together with new filter bed and a covered service reservoir—all to form part of a future gravitation scheme from the Taff Vawr Valley; and that application be made to Parliament for powers to take the waters of the Taff Vawr river and its tributaries near the Beacons in Breconshire, for storage in large reservoirs, with an aqueduct to Cardiff. The late Mr. J. F. Bateman reported in confirmation of Mr. Williams' recommendation in favour of the Taff Vawr source. An Act was obtained in August, 1884, for the following works: Three large storage reservoirs, with a total capacity of 1,220,000,000 gallons; three balancing reservoirs at Cefn, Blackbrook, and Rhubina respectively; also a high-level service reservoir and set of filter beds at Rhubina for the future supply, by gravitation, of Penarth, Llandaff, Whitchurch, Maundy, and Penylan; an aqueduct connecting the different reservoirs together, and passing down the valley of the Taff to the two storage reservoirs at Llanishen and Llysane, four miles north-east of Cardiff. The length of this aqueduct is 32 miles. The area of gathering ground above the lowest reservoir of the series is 10,400 acres, and of this the "upper portion" to the foot of No. 2, or Cantrefr Reservoir, contains 4,000 acres of mountain pasture. This gathering ground stands at an elevation of 1,080ft. above sea-level at the embankment of Cantrefr Reservoir, and it rises to a height of nearly 3,000ft. at the Brecon Beacons. The first portion of the works, now completed, comprises the storage reservoir, called Cantrefr Reservoir; the balancing reservoirs of Cefn, Blackbrook, and Rhubina; also the high-level service reservoir and two filter beds for the future high-level service by gravitation of the suburban districts above the reach of the ordinary supply of Cardiff; the aqueduct, or conduit, from Cantrefr Reservoir, passing through the balancing reservoirs, and terminating in the storage reservoirs of Llanishen and Llysane, near Cardiff. The aqueduct was commenced in October, 1885, and completed in September, 1888. The balancing reservoirs, together with the high-level service reservoir and filters, were commenced in December, 1887, and completed in November, 1888. The Cantrefr Reservoir was commenced in March, 1886, and is now just completed, the time occupied in its construction being 6½ years.

DORKING SEWERAGE.—A section of this work, under Mr. Rapley, surveyor to the rural sanitary authority, has recently been completed. The pipes had to be laid under very unfavourable conditions in waterlogged soil at a depth of 13ft., the water rising in places 9ft. above the pipes. Doulton's patent self-adjusting joint, which has proved of great value under such circumstances, was adopted, and the sewer on completion was found to be perfectly watertight.

EASTWOOD AND GREASLEY SEWERAGE.—In December last the Basford rural sanitary authority sanctioned the appointment of a local committee to consider the best means for the disposal of the sewage of Eastwood and Greasley, and they decided that Mr. Herbert Walker and Mr. W. H. Radford, civil engineers, both of Nottingham, should be invited to submit plans, and the committee to decide which was the most suitable. These plans were submitted last March, and after an exhaustive inquiry into the merits of both schemes, the committee recommended that Mr. Herbert Walker be appointed the engineer to carry out the proposed works. Plans will be submitted for approval by the Local Government Board in due course.

THE SEWAGE QUESTION IN THE WEST RIDING.—The Pontefract Rural Sanitary Authority in March last received a scheme for the drainage and sewage treatment of Burton Salmon—an entirely agricultural township—at a cost of £1,500. This scheme, which, small as it is, involves a pumping lift of some 10ft. or 12ft., has been accepted by the township. In May a scheme for the drainage of Brotherton township, at a cost of £2,700, was received, which also involved pumping; while on Saturday, the 10th inst., three alternative schemes were submitted for the drainage of Glasshoughton

township, at a cost varying from £3,000 to £4,000. Two of these schemes are for combining respectively with the adjacent districts of Castleford and Whitwood, by discharging the bulk of the sewage into their respective sewer systems at a fixed charge per house, and the third is for dealing with the bulk of the sewage within and by the township itself. This self-contained scheme was recommended by the authority's engineer, Mr. Malcom Paterson, M.Inst.C.E., of Bradford, as by far the most efficient and economical. In this case, three alternative schemes are by gravitation only, so far as the township itself is concerned; but the Castleford system, which also was designed in 1875 by Mr. Paterson, involves a lift of no less than 60ft. Incidentally, in the engineer's report, it was mentioned that during the past year alone the population had increased 18 per cent., and that this was entirely due to the operation of the newly-completed water supply, thus showing how the supply of vital needs influences population. In all the above schemes it is proposed to treat the sewage on land, which is undoubtedly the best resource in rural districts.

STAINED GLASS.

LARGS, N.B.—Messrs. Stephen Adam and Co., Glasgow, have just completed the erection of two stained-glass memorial windows in the transept of the new United Presbyterian Church at Largs, one representing the angel appearing to Cornelius, and the other taken from Proverbs xxxi., "She stretcheth forth her hand to the needy." The other windows in the church, to be erected by Messrs. Stephen Adam and Co., will illustrate "David playing before Saul," "Christ, Martha, and Mary," and two sketches for another window, representing Boaz and Ruth, have just been finished.

STATUES, MEMORIALS, &c.

DURHAM.—A statue of the late Mr. William Crawford, M.P. for Mid-Durham, was unveiled on Saturday outside the Miners' Hall. The commission was executed by Mr. Joseph Whitehead, of the firm of Whitehead and Sons, of Vincent-square, Westminster. The statue is carved in white Sicilian marble; it is 7ft. 6in. in height, and represents Mr. Crawford in a standing posture. His right leg is set forward, with a finger of the right hand in his trousers pocket. His left hand rests on a pedestal, and the head is uncovered. The statue will be mounted on a block of Aberdeen granite. The statue is in immediate proximity to that of Mr. Alexander McDonald.

CHIPS.

Mr. Thomas Ross Salmond, M.Inst.C.E., of Park House, Belfast, for upwards of twenty-one years chief engineer to the Belfast Harbour Commissioners, has now retired from the board's service, but intends to act professionally as a consulting engineer and arbitrator.

The ventilation of the new Hospital Hut, Pembroke Docks, has been carried out by Messrs. Baird, Thomson, and Co., whose improved patent "Ejus" invisible roof ventilator has been used for the extraction of vitiated air.

We are informed that the old-established firm of John Freeman and Sons and the West of England Granite Company have amalgamated, and will in future be known as John Freeman, Sons, and Co., Limited. It is not the intention of the company to offer the shares to the public. The offices of the late firm of John Freeman and Sons, at Penryn, Cornwall, will be the head office of the new company, and the management will be in the hands of Messrs. Freeman and their staff. An office has been opened at 9, Great Queen-street, Westminster, where the company will be represented by Mr. Bernard A. Freeman.

Mr. Forman, civil engineer, of Glasgow, and Mr. M'Rae, solicitor, of Edinburgh, have made an ascent of Ben Nevis, with a view to a survey of the proposed route for a railway to the summit. It is stated that there is a probability that the undertaking will be proceeded with.

The memorial-stone of St. Paul's Church, Walsall, was laid on Monday. The church will be built from plans by Mr. J. L. Pearson, R.A., and will cost about £9,000, towards which £7,000 is in hand. The tower and vestries will be left over for the present.

A chancel screen has just been placed in the church of St. Michael and All Angels at Folkestone. It was designed by Messrs. Bodley and Garner, the architects of the church; and has been carried out by Messrs. Ruttee and Kett, of Cambridge, the cost being about £700. It is carved in oak, with wrought-iron gates, there being on the lattice work small shields, which will be illuminated. Above the screen, within the arch of the roof, is a rood, also elaborately carved, the cross bearing emblems of the Four Evangelists.

Our Office Table.

THE *conversazione* inaugurating the fifty-sixth session of the Architectural Association is now definitely arranged to be held on Friday evening, October 7th, at the Imperial Institute, South Kensington. The President, Mr. H. O. Cresswell, A.R.I.B.A., and the Committee will receive the members at 8 p.m. It has been arranged that the subway from South Kensington Station will be kept open on that evening.

THE detailed report of the burning of the Metropolitan Opera House at New York, which was regarded as a model of fireproof theatre construction, shows that the damage caused was, as usual, greatly exaggerated in the cabled summaries first received. At the time of the outbreak everything appears to have been done to minimise the fire-resisting properties of the building. The iron curtain between the stage and its auditorium had been raised to its full height, and a temporary wooden flooring had been built over the whole auditorium. On these floors and the stage the scenery of the opera house and of two other theatres was being repainted, and the finished canvases were stacked on the flies and wings. It only needed a little carelessness on the part of a scene painter or labourer to convert the place into a furnace, and this was duly provided. Notwithstanding all the negligence displayed, according to the *American Architect* "the fire-resisting portions of the opera house did their work exactly as they were expected to do it, and the fire gave the best demonstration that we have yet had of the soundness of the principles of theatre construction which are now accepted by architects, and which received their first important application in the United States under the skilful direction of Mr. Cady, in the building in question." With the exception of the stage roof and fittings and the decoration of the auditorium the fabric seems to have been little injured.

THE repaving of Holborn, Chapside, Ludgate-hill and other London streets, is certainly a question which the City authorities have been a long time thinking about, but the principal question is whether they have not made up their minds to adapt the pavement to the gradient of the roads. Surely the smooth paving block which answers in the level portions of our streets is not the best adapted for the inclines, where common sense would dictate a grooved block, or if such cannot be used, the old-fashioned granite paving. Ludgate-hill, now that it has been widened, ought to be paved with a block that will both give a foothold to horses struggling up hill, and offer resistance to the traffic coming down hill.

An Exhibition of Modern Paintings has been opened in the Nottingham Museum and Art Gallery. The council of the Royal Academy lend the Chantrey bequest picture, the sensation of the Academy of 1891, "St. Elizabeth of Hungary's Great Act of Renunciation," by Mr. Calderon. Sir J. E. Millais is represented by his "Widow's Mite," lent by the Corporation of Birmingham. Mr. G. F. Watts contributes his portrait of Mr. Walter Crane, recently hung in the New Gallery Exhibition. Mr. La Thangue has sent his "Mission to Seamen," and Mr. Bourdillon is represented by "The Only Survivor." Mr. F. W. W. Topham contributes a large picture entitled "Judas," which has also been seen at Burlington House, as has a landscape by Mr. D. Farquharson of "A Scotch Mountain River Scene."

THE destruction of lead water-pipes by electric action is one of the results of laying on electric currents by the side of water-pipes. A report by Major Cardew, R.E., to the Board of Trade, draws attention to the damage sustained by a lead water-pipe and a gas-meter in proximity to a culvert of an electric supply company. The main of the company was found just above the water-pipe, which had been eaten through twice within a few months. Tests with the galvanometer established the fact that there was a difference of potential of about 6 volts between the iron culvert and the water-pipe, the former being negatively charged as regards the pipe. Water was found in the electric culvert, which had touched the positive main. Some lead-covered wires used as pilot wires had been fused, and the expert stated that he had little doubt that a connection between the negative conductor and the

iron of the culvert was effected by the fused and stripped ends of these pilot wires. The flow of positive electricity from a metal into a damp medium or water generates oxygen at the surface of the metal, which is thereby corroded, and this action destroyed the water-pipes. The gas-pipe encased in bitumen was unaffected.

THE Edinburgh town council will promote next session a Municipal Improvements Bill for carrying out various works involving an estimated cost of upwards of £74,000. The principal improvement consists of the widening of Bristol-street, Salisbury-place, and other thoroughfares by the removal of extensive blocks of buildings, and the construction of a new street in the Fountainbridge district.

THE Architectural Association.—October 1st. Summer Visit to St. Alban's Abbey, St. Michael's Church and Gateway, postponed from September 3. Mr. James Neale, F.S.A., has kindly consented to act as guide. Train 2.5 p.m. from St. Pancras. P.O. for 2s. 6d. to be sent to Mr. Francis Hooper, 14, Sackville-street, W., before Thursday, September 29th.

ERNEST S. GALE } Hon. Secs.
F. T. W. GOLDSMITH }

Trade News.

WAGES MOVEMENTS.

COLNE, LANC.—The plasterers' strike at Colne and Nelson has terminated, the men's wages being advanced from 7d. to 8d. per hour.

LANCASTER.—The joiners' and carpenters' strike at Lancaster, which has lasted nearly 11 weeks, was settled on Friday at a meeting of masters and delegates. The men receive an advance of 3d. per hour, making 7½d., and commence work at seven on Monday mornings instead of six. There are other concessions as to overtime, time and a quarter to be paid after half-past five, and time and a half on Sundays and Bank Holidays. The men asked for 3d. advance.

A permanent Gothic Roman Catholic church accommodating 600 persons was opened at Silver-town, E., last week. Mr. Tasker was the architect.

A new water supply for the village of Berry-narbor, North Devon, has just been completed at the cost of £700, at the sole cost of Mrs. Basset, of Watermouth Castle. A new reservoir has been made, and a main pipe laid down. The excavating, which has been considerable, owing to the hard nature of the rock, has been executed by men on the Watermouth Estate, the reservoir having been built by Mr. Garland, of Barnstable, and the plumbing was done by Mr. F. Steer.

At the last meeting of the Mersey docks and harbour board, a recommendation of the marine committee was adopted to expend a further sum of £10,000 in experiments for the improvement of the port of Liverpool by removing sand from the bar of the Mersey.

The work which has been carried out in connection with the restoration of the ancient church of St. Mary's, Fairford, was dedicated at a special service on Tuesday by the Bishop of Gloucester and Bristol. The restoration, which has cost over £5,400, has been carried out from the plans of Messrs. Waller, diocesan architects, and the re-casing of the roof was intrusted to Mr. James, of Cirencester.

Mr. Hubert Herkomer, R.A., as purchaser for the National Gallery, Melbourne, has written to the trustees of that art institution to the effect that he has bought modern pictures, because he did not like to spend public money on works of doubtful authenticity, and that he knows no more risky venture than collecting Old Masters.

Mr. Frank Wood, C.E., has been recommended by the general works committee of the city council of Wakefield, from among 80 candidates, to the appointment of assistant city surveyor, and to take charge of the sewerage and sewage disposal schemes of that city. Mr. Wood was assistant surveyor to the local board of Walton-next-Liverpool until two years ago, when he was appointed assistant to the borough engineer of Leicester.

Sir Massey Lopes has laid the foundation-stone of a new church, which is being built at Horrabridge, Devon, at a cost to himself of £2,000, as a memorial to his daughter Louisa, who died suddenly two years ago.

The Dundee Fine Art Exhibition Committee have resolved to hold an exhibition, to be called "Old Dundee," in the coming winter, with the object of illustrating the history and development of the city.

The new branch line from Paddock's Wood Junction to Goudhurst and Cranbrook was opened last week.

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TENDERS.

Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

AYR.—For the construction of the first section of the extension of the esplanade, for the town council:—
 Clarke, W. (accepted) £1,374

BATH.—For the erection of the new municipal buildings, for the city council. Mr. J. M. Brydon, of London, architect:—

Escourt T., Gloucester £27,823 0 0
 Hayward & Wooster, Bath (accepted) 22,253 0 0
 (Ten intermediate tenders received.)

BRIDGNORTH.—For retiling the roof of the Grammar School, for the town council:—
 Bowen, T., Netchworth (accepted).

BRIXTON, S.W.—For shop fitting, 212, Brixton-hill, for Mr. T. Lighton. Mr. M. V. Treleven, Acre-lane, Brixton, architect and surveyor:—

Joiner, painter, &c.:—
 Freight £481 14 9

Braby and Co. 114 6 4

Carter and Co. 59 6 0

Green and Son 61 0 0

BRACKPOOL.—For brickwork in connection with the Blackpool Tower Buildings. Messrs. Maxwell and Tuke, architects:—

Cardwell Bros., Blackpool* £7,832 8 4
 * Accepted.

BROADSTAIRS.—For the erection of a detached house on a piece of land situate off the Rectory-road, Broadstairs, Kent, for Mr. Frank K. Cochran. Mr. William A. Burr, M.S.A., 65, Chancery-lane, W.C., architect:—

Paramor and Son, Margate £1,700 0 0
 Oldrey, London 1,450 0 0
 May, Broadstairs 1,285 0 0
 Martin, Ramsgate 1,199 0 0
 Brown and Son, Margate 1,150 0 0

BURSELM.—For fencing in the Grange recreation ground, for the town council. Mr. Mawson, surveyor:—
 Elsby, R. C. (accepted) £123 0 0

COVENTRY.—For the restoration of the great north window of St. Mary's Hall, for the city council. Mr. Edward Burgess, architect:—
 Grylls, J. T., London (accepted) .. £300 0 0

(Estimated cost of restoration of stonework of window, £329.)

FROME.—For new villa residence, for Mr. W. R. Wheeler. Mr. W. G. Brown, Frome, architect:—

Seward, T. J., Frome £590 0 0
 Hodder and Sons, Frome 545 0 0
 Chislett and Son, Frome (accepted) 502 0 0

FROME.—For new shop front and other alterations at No. 1, The Bridge, Frome, for Mr. Charles Waters. Mr. W. G. Brown, architect:—

Hodder and Sons, Frome £248 0 0
 Seward, F. J., Frome (accepted) ... 215 0 0

HIGHBURY.—For alterations and additions to the Islington Relief Offices, Highbury Mews, N., for the guardians of the poor of the parish of St. Mary, Islington. Mr. William Smith, A.R.I.B.A., 65, Chancery-lane, W.C., architect:—

Bellew £200 5 0
 Whitehead and Co. 180 0 0
 Linfield 170 0 0
 Ward and Lambie 148 0 0
 Ruffell 140 0 0
 Harvey 138 0 0
 Marchant and Hirst 137 7 0
 Langham 137 0 0
 Brass and Son 136 10 0
 Norris and Luke 121 0 0
 Lownd and Son 117 0 0
 Kershaw 116 0 0
 Coote, C. 114 8 0
 White and Son 112 0 0
 Stevens Bros. (accepted) 107 0 0

LEAMINGTON.—For repairing the tar pavements in the Lillington and Milverton district, for the town council:—
 Asphaltic Concrete Co. (accepted) .. £72 9 6

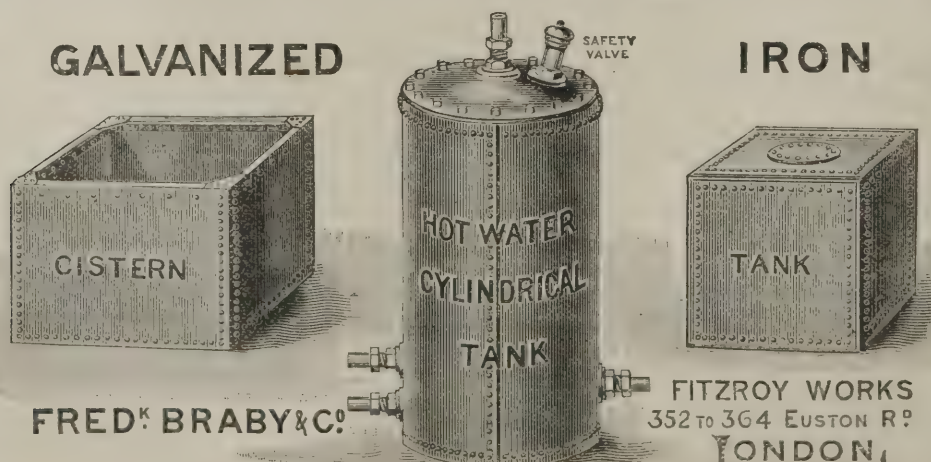
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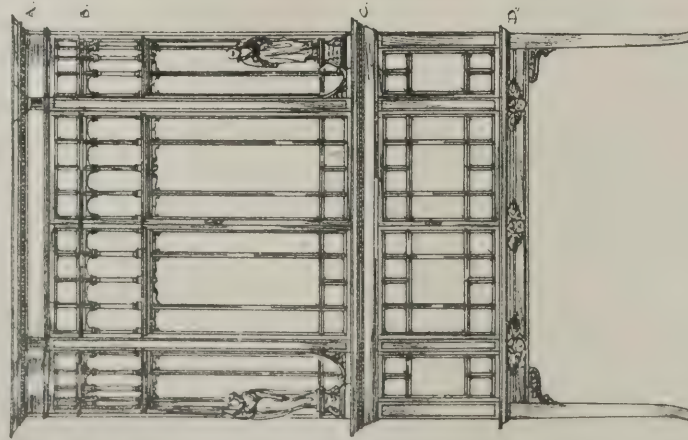
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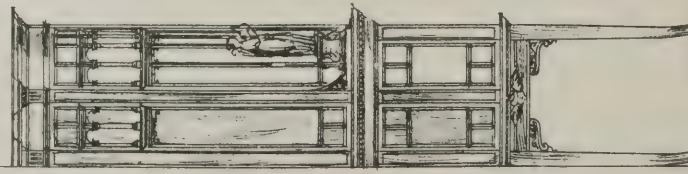


B.N.D.C.
Design for
"A ROSEWOOD CABINET." By "Vulcan."

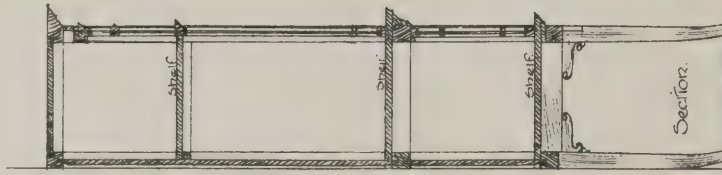
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Front Elevation.



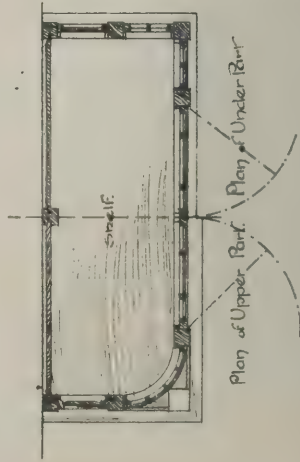
End Elevation.



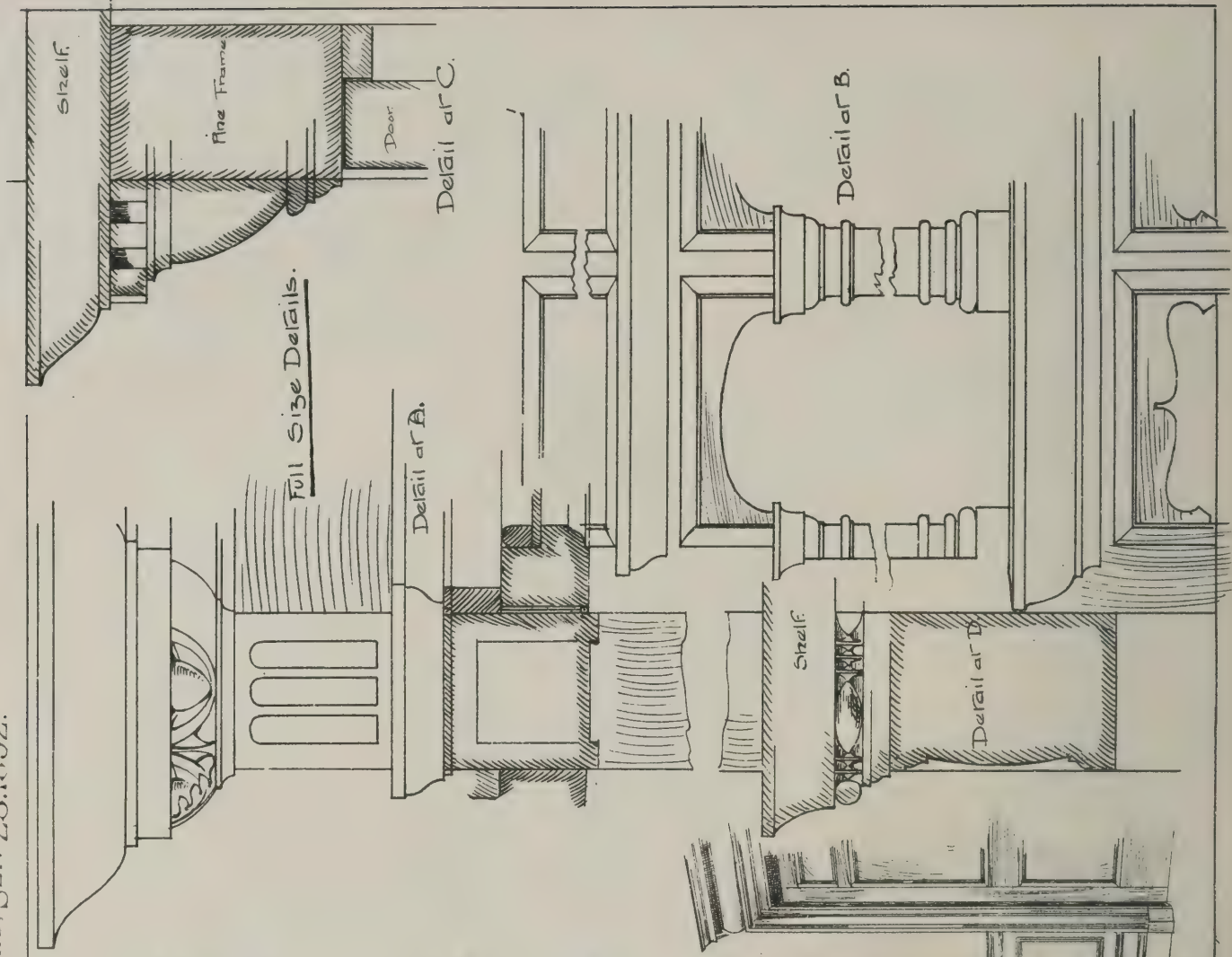
Section.



Perspective Sketch.



Plan of Upper Part. Plan of Under Part.



Full Size Details.

Detail at 'A'.

Detail at 'C'.

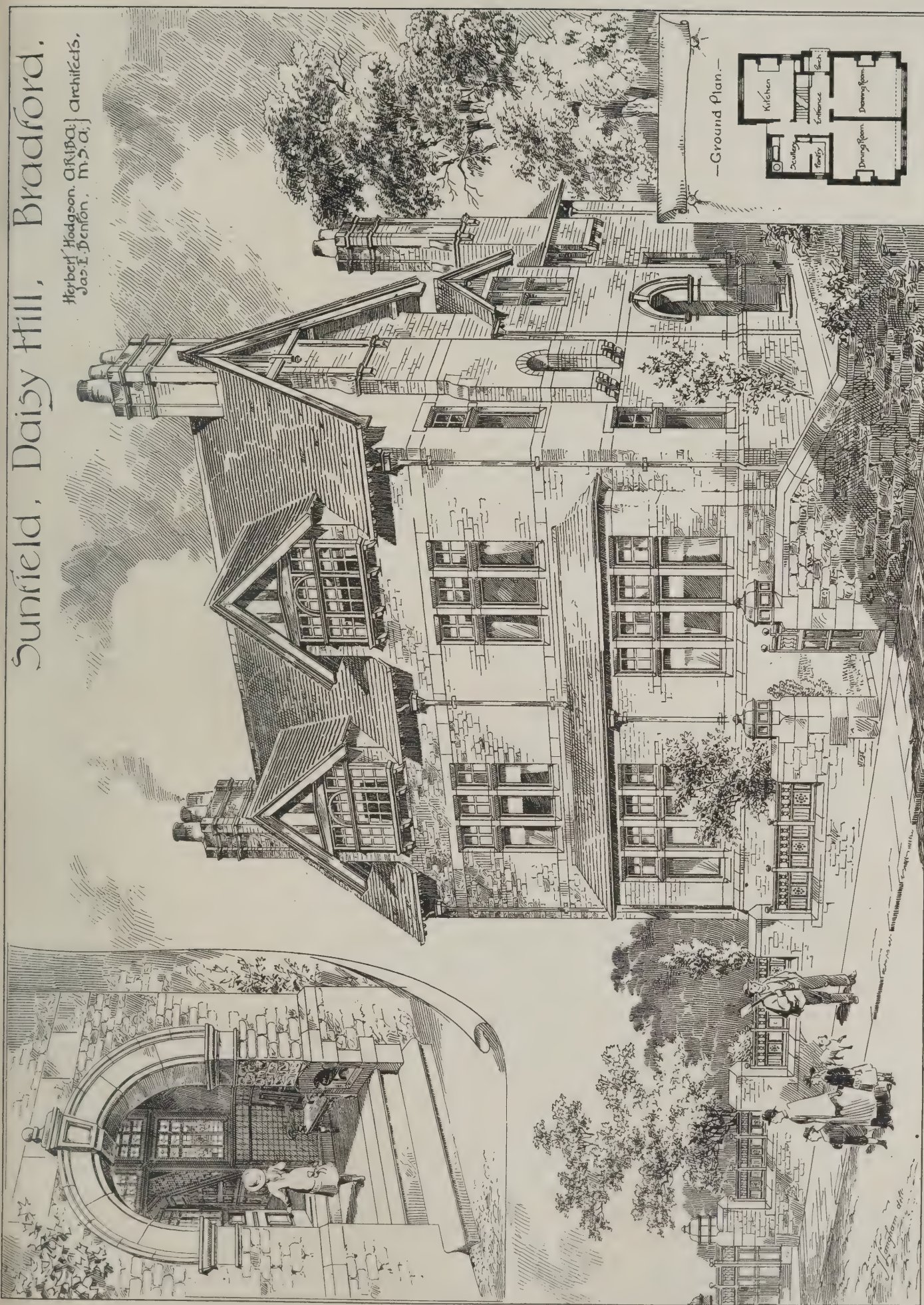
Detail at 'B'.

Shelf.

Detail at 'D'.

Sunfield, Daisy Hill, Bradford.

Herbert Hodgson, Architect.
325 E. Denon, M.D.A.



—Ground Plan.—



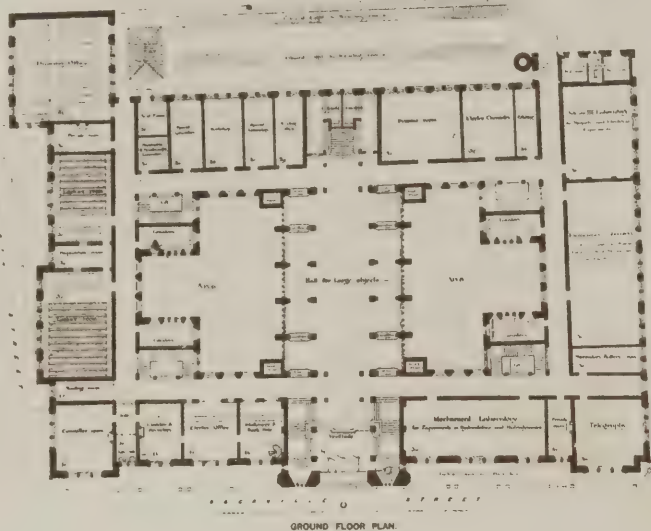


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THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1969.

FRIDAY, SEPTEMBER 30, 1892.

ARCHITECTS AND PUPILS.

"THE odd thing about pupils is, that the less they pay the more they expect." So a well-known architect was heard to remark some time ago—and his statement was by no means destitute of foundation. The young man who, in return for a premium of several hundred pounds, "gets the run" of a large office is generally content—at least, while his articleship lasts. If he has paid less than two hundred, he will expect more individual care and notice; while if his premium has been almost nominal he, or his friends for him, will feel ill-used if the principal does not give him a large share of his time and attention. For some people even this is not enough; and parents have been known to expect that an architect, on being intrusted with such a treasure as their boy, should give up looking after his buildings, and sit in the office all day to watch over him. Others are more anxious that their child should never be called upon to do anything menial or derogatory. In an action brought by a man of this sort some years since, the head and front of the principal's offending was the fact that in changing offices he had directed his pupil to carry a small gas-meter across the street.

Moralists tell us that human folly is boundless, and for some of these ridiculous fancies it must certainly be held responsible. If a boy is so weak and silly that he needs incessant watching, he should have been kept at school till he grew wiser. If he is too delicate to touch anything rougher than a sheet of paper, he should have been apprenticed in a fancy-shop, and not thrust into a profession which will require him to pick up bricks and handfuls of sand, and to rub his nice clean clothes against dirty ladders. But many complaints spring from misunderstanding. A pupil does not know, and his friends do not know, exactly what he ought to be doing, or what sort of training he ought to have. They are aware that he must be able to draw, and that he will have to distinguish good materials from bad. But of the infinity of other things which an architect has to learn, they never dream, and when a pupil is kept for any considerable time at these other things, they vaguely suspect that he is being neglected, and is wasting his time.

Sometimes an architect has to teach things that ought to have been taught at school. A lad, supposed to be well educated, cannot, perhaps, write a legible hand; he cannot compose a grammatical letter, or spell it when he has composed it. Perhaps his arithmetic is at fault, and he cannot square up a few simple dimensions, or add up a column of figures. Such things as these should not need to be taught in an office, and yet office training can hardly go far till they are taught. But if a pupil is set to perfect himself in necessary preliminaries of this kind, he feels, naturally enough, that they are not architecture, and that he was not articled to study them. It is quite true; but then he should have studied them before his articleship began. Suppose, however, that he starts fair. The difficulty then is, that in the three or four, or even five, years of his term he can only take up effectually a part of the subjects which he will need to be familiar with. The wisest course, perhaps, would be to make a selection at first: to apply himself thoroughly to the subjects he selects, and to go on with the rest after mastering these. But this is not the plausible course. No matter that the

ordinary term is not half long enough to make the cleverest pupil into an accomplished architect; no matter that diligence in pupils is by no means universal; clever or dull, diligent or idle, they all expect to learn a little of everything. And the principal who does not give them a little of everything must expect to have it said of him, "I was articled to Mr. So-and-So: I was with him so many years; and yet he never taught me a particle of this, and that, and the other."

We are not saying for a moment that no architects are indifferent, and that no pupils have ground for complaint. We are merely pointing out that pupils, and especially their parents, not unfrequently complain through ignorance. They do not know when they are being well treated. Let us see, therefore, what is comprised in a thorough architectural training. First, then, there is drawing, which is acquired rapidly by some and very slowly by others. The sort of drawing that is necessary varies much in the different branches of the profession. The pupils of the shed and factory architect require to rule straight lines neatly, and to draw plain plans to scale. Those of the artistic architect begin where the last-named leaves off, and require a thorough knowledge of detail, as well as great skill in execution. The decorative architect's work needs these last accomplishments, with freehand drawing besides—enough by themselves to occupy a whole articleship, and to form the basis for a special type of practice. Merely geometrical drawing, again, is not enough. Every architect should be able to sketch rapidly in perspective as well as to draw carefully in it, and to do either implies very considerable progress. But suppose drawing fairly mastered—a supposition which the charity that "hopeth all things" may entertain—perhaps about one pupil in a dozen after four years' work. Then comes construction. The rudiments of this will have been picked up in copying drawings and details. But to pursue the subject, to know the best ways of building even simple structures, and to understand why those ways are best, to go on to more complicated cases, to foresee the weaknesses which time will bring out, and to provide against them, to design, to calculate, and to invent new types of structure. This is obviously a sort of training that will be going on for a lifetime. Every pupil should be made familiar with the beginnings of the science, but he will be far beyond the period of pupilage before he is thoroughly at home in it.

The study of materials will naturally go on at the same time with that of construction. With the pupil who lives in a large town, and keeps his eyes open, it will be always going on. Everywhere he will be able to learn, both from old buildings and new ones. In the former he will see what sorts of stone last, and what sorts decay, and he will notice whether the decay arises from bad material, or only from improper bedding. He will mark the shrinkage of joinery, and familiarise himself with the aspect of inferior wood. He will see how sappy edges begin to moulder, and ill-seasoned beams to twist. So in every trade he will be on the look-out for defects that he may guard himself against the causes that lead to them. Where buildings are in progress he will narrowly watch the class of materials that are being supplied; he will form his own opinion as to those that ought to be rejected, and be interested in ascertaining whether or no they are allowed to pass. Where foundations are being dug out he will judge as to their goodness or badness, and see whether proper means are adopted to make them secure. An immense amount of information is in this way accessible to every pupil as he goes along the streets. It does not matter whether the buildings he looks at are, or are not, being executed by the architect to whom

he is articled. If they are, an idle pupil may go about them day after day, and month after month, and be none the wiser for his wanderings; and if they are not, a great deal of the training they can supply is open to everybody who cares to look and consider. There is no special magic about the buildings that are being put up from designs made in the pupil's office. If he wants an excuse for not learning, he may make one up out of the fact—should it happen to be a fact—that his principal has few buildings in hand which are near enough to be accessible to him. But in towns like London, and like a hundred smaller ones, it is only an excuse. Materials may be studied in one building as well as in another, and where work is going on, or has gone on, teaching is always going on, too, for those who have ears to hear it.

That architectural training, again, is a very poor one which does not teach the student to think. Some pupils have a tendency to lapse into mere machines. Give them a drawing to copy, and they will copy it admirably. Give them the smallest bit of work that requires thought and at once they are paralysed. Sketch out roughly, for instance, the ground plan of a cottage, and ask them to draw it to scale. A. perhaps will give his mind to it—will try to realise the requirements and to supply them. He may make mistakes, but they will be the mistakes that arise from imperfect knowledge—the mistakes that are natural and excusable to anyone with only two or three years' training. B., on the contrary, either from want of thought or from mistrust in his own abilities, will make mistakes of quite a different kind. A. may be depended on to see that every room has a door and a window, though he may put his doors and windows in places which are not the best. B., on the contrary, is as likely as not to leave out both doors and windows. Sometimes he does this from want of imagination. To him the plan does not stand for a view showing the arrangement of a possible cottage, in which he can fancy himself walking about, and going from one apartment to another. To him it is merely so many lines ruled in, some going lengthwise on the paper and some crosswise. Or perhaps he is so anxious not to put the doors and windows in bad places, that he falls into a state of irresolution, and cannot make up his mind to show them at all. A remedy for this would be for him to make half-a-dozen alternative plans, showing doors and windows in different positions. Out of these he might select the best, and by efforts of this sort he would effect real progress. In one way or another, progress of this sort is indispensable. The very essence of an architect's work is the solving of problem after problem, of puzzle after puzzle. If he is anything, he is a fighter of difficulties, a conqueror of things too hard to be conquered by untrained intelligence: and he cannot begin too soon to strengthen his mental muscles and sinews for the labour of his life. In other words, he cannot begin too soon to plan and to design, and no more valuable training can be given to him than to let him assist in shaping the form and arrangement of some architectural work.

If a pupil has got in him this capacity for dealing with difficulties, sooner or later he is pretty sure to learn all he needs. There is plenty of it: architecture proper, with the endless details of different styles; the planning of the various sorts of buildings he is likely to be intrusted with; the local regulations which he will have to conform to in different parts of the country; the laws and decisions about light and air cases; sanitation, drainage, plumbing, warming, and ventilation—with a list of other things that might stretch out to the crack of doom. Talk of learning them all in three years! Threescore years are far too short; and if it were not that one class

of work falls to one architect's share, and another class to another's, it would be beyond the power of human faculties, in this 19th century, to be an architect at all.

MANY-STORIED BUILDINGS.

THE requirement of height in modern buildings, or the number of stories, apart from sanitary considerations, has not, on the whole, been favourable to that dignified treatment of our architecture which we see in ancient examples. Restricted areas of site have mainly brought about the change to which we draw attention. In nearly all our new streets this element is beginning to assert itself in a manner that cannot be said to exhibit any promise, rather savouring of a multiplication of small and ordinary features. Comparing the work of the generation preceding our own, a largeness of scale is conspicuous in the elevations; the columnar ordonnance was proportioned to the whole or the upper half of the building, as we find in edifices like the Royal Exchange, the Bank of England, St. George's Hall, Liverpool; or, again, in Somerset House, Greenwich Hospital, Burlington House, and a number of other well-known buildings. In the Parliament Houses even, with its numerous subdivisions and elaboration of detail, we have a structure of two main stories. These are, perhaps, exceptional examples of edifices erected on picked sites, yet they serve to illustrate in a somewhat exaggerated manner the contrast between the old and new methods. The piled-up story is a modern invention to be seen in the huge club-houses and hotels in Northumberland-avenue, the Victoria Embankment, at South Kensington, and many other parts of this overgrown metropolis. What it is destined to become we do not know, though we devoutly hope the craze will never reach the proportion it has done in Chicago and other cities of the States, where the "Manhattan" the "Monadnock," the "Title and Trust," and others are buildings that have reached sixteen stories in height. To say nothing of this fashion of piling people in huge cases of layers or floors, we can estimate the effect of this vertical repetition of features. Where, we ask, is the architecture in this huge structure of piled-up stories? Such a building has lost all claim to the title of being architecturally designed, or to be mentioned in the same breath with any of the single-storied or triple-storied structures of the Classical Revival. It is no longer a piece of architecture, but a collection of stories comparable to a chest of drawers or a case of pigeon-holes—a vertical repeat of one unit. No design runs through the composition, as in the case of a façade with a single order, divided into parts as a projecting centre and wings. Let us imagine two hypothetical treatments—one of an architecturally-divided building, and the other of the multiplication of stories. Let us take, as an instance of the first, a building of, say, 100ft. frontage and 50ft. in height, divided vertically into three stories, the lower one a bold basement, a principal floor of large windows, and a lower upper story. The two upper stories may form part of an ordonnance of a single order of columns, as we see on the façade of the Banqueting Hall, Whitehall, and in that of Somerset House, both examples of the Palladian-Italian; we have in such a division of fenestration a dignified front. The façades of the Reform and Travellers' Clubhouses in Pall Mall afford the same three-fold division of stories, only without columns, considered by all competent authorities excellent examples of the Astylar-Italian. Now add another story or two, and the whole scale is reduced, and the dignity and repose of the elevation is lost. It makes no difference if we make the block higher; the

architectural unity is destroyed. We may improve the façade by breaking it into a centre and end wings, by pediments or pavilion roofs, but the composition still lacks that oneness and connection which we have in the first case. The crowded window front is the *crux* of modern architecture; how to bring it into any order or arrangement of parts is one of the chief difficulties in the design of buildings like hotels, blocks of industrial dwellings, and warehouses. Requirements often involve a repetition of stories and windows of like size and proportion. A modern hotel or block of dwellings in flats calls for stories of similar height, and the windows are necessarily repeated on each floor. As quite a recent instance, we may mention the designs for the Manchester Technical School, which have just been exhibited, many of which represent the main fronts filled by six stories of windows, perfectly flat, without any projections or divisions. This number of floors had to be provided to accommodate the several departments and the competitors within the space of ground. Under these conditions it was impossible to adopt the more limited number of stories, and many of the designs represent, as a consequence, lofty façades to the principal streets filled with windows of a commonplace kind. The meagreness of many of the elevations submitted is to be attributed to this cause. The many-storied structure for technical schools, industrial dwellings, and other similar purposes, opens up a new problem in architecture. How they can be made agreeable to the eye is a point for the architect to decide. The monstrous American erections to which we have referred display the first attempts to master the problem of putting as many stories as possible under one roof. The introduction of a massive rusticated basement or lower story of granite with wide semicircular arched entrance, with a variation in the vertical lines of window openings, are features of merit. A low basement story of ordinary height would be crushed in appearance under 12 or 14 upper stories above it—it would look as if it had sunk into the ground. Exceptionally bold and massive treatments have been shown in the "Auditorium Building," Chicago, one of the largest and highest buildings of the kind in America. The third lower stories are of rough granite, with wide intervening piers between the windows, and above this the fenestration is comprised under a lofty arcade of recessed arches embracing four stories. The angles are massive and wide, and above the windows are arranged in pairs of two stories. The Title and Trust Company's building has three lower main divisions or stories of granite. The windows are placed in pairs above, and the upper story forms an arched attic above a bold cornice forming a balcony. In other buildings of this class wide piers ascend between windows, arranged in pairs or triplets. All these attempts to introduce variety and unity in the fronts are worth study.

We may in conclusion draw attention to two or three modes of dealing with fronts of many stories. The worst is a large flat wall pierced by windows, evenly spaced, and of similar size. The eye vainly strives to find order and rest; to detect design is impossible, for there is none. A second, and almost as unsatisfactory, is to divide each story horizontally by cornices or string-courses. The next mode is to pair the windows, to bring them together in vertical rows with wide intervening wall spaces, a plan that at once introduces order. If the openings themselves are varied in height and shape, an additional element of interest is given. Better still is the grouping of windows by placing them in twos or threes; and this may take the form of lateral or side-by-side lights, and those in tiers under one arch. Each of these methods may be illustrated by examples.

The last mentioned, made of grouping, may be noticed in the adopted design for the Municipal Buildings, Oxford, illustrated by us in July, and in the just-selected design for the Manchester Technical School we published last week. Here it will be noticed the windows are pleasingly grouped in twos and threes on the Sackville street front, superimposed and slightly projecting. Other modes of producing variety are open, as, for instance, recessing, advancing, alternating the series, &c. The horizontal division in stories is often overdone by string-courses, &c., the effect of which is to produce a piled-up or chest-of-drawers-like appearance; but the vertical grouping, or what we may term the "pier and window" arrangement, has grown into favour with the revival of Italian, Flemish, and other varieties of Renaissance. A well-marked basement story and cornice below the upper tier of windows considerably break up and relieve the façade of many stories, and it is a marvel, too, what grouping and gathering up the windows into vertical rows does. The same number of distributed single windows would produce an effect at once overcrowded and confusing. Our prodigious blocks of residential flats, monster hotels, and warehouses, which we find in every West-end suburb, Victoria-street, Knightsbridge, Kensington, Soho, and other parts, still encumber the ground with their senseless disregard of those principles of distributing their many stories and windows.

SEASIDE DWELLINGS.

THE seaside dwelling is a typical structure of its kind, in which a small frontage with a display of bay windows and balconies leads one to expect superior accommodation to that afforded in the ordinary town house; but the expectation is not realised. The value of sea-frontage has restricted one important dimension, which is felt as much in the streets at right angles to the front, where the attempt has evidently been to get as many houses as possible in the short distance between one street and another. We find this to be the rule at Brighton, Eastbourne, Worthing, and, in fact, all places where the sea-frontage is the great consideration. With such a condition we can expect little but cramped passages and stairs, small rooms, and deficient office accommodation. That many of these houses were built as private dwelling-houses at a time when the town was just growing into popular favour may explain the insufficient attention paid to planning. As boarding houses or apartments they were not intended; the system of *en suite* apartments or "flats" had not become acclimatised when half these dwellings were erected. The migrating Londoner was scarcely so well known. He now demands superior accommodation, and desires to have all his rooms, if possible, on one floor. It is extraordinary that with a regular "season" of residence by the seaside, so little has been done, except in one or two well-known resorts, to adapt the old-fashioned house to the new requirements. In many of the houses even the *en suite* arrangement has not been introduced, the separate landing entrance to each room remains, with all the attendant inconvenience arising from different families occupying the same floor. In many houses situated in the main front and side streets of Brighton and Worthing this sort of accommodation has to be endured. In a few houses a doorway has been made between the front and back rooms, thus converting them into distinct flats; but a great deal more is wanted. The conveniences are, perhaps, downstairs, also small and cramped, or some kind of improvised projection has been made at each landing for the purpose. Externally the bay window is a recognised feature in most seaside towns; it is sometimes carried up to

the upper floor, and in the side or off-streets it becomes a boon, as it allows a view to be had of the sea from every front room. In the larger houses, facing the sea, the bay is often combined with a balcony, which forms a sort of connecting outside corridor between the bays. In many of the new residences at West Brighton this arrangement is quite common. Much may be done nevertheless to vary the design by making bayed projections, and by a better class of ironwork than that usually met with, which is exceedingly commonplace and weak-looking. The loggia is seldom found as an integral part of the design. Even in the "Grand" and Métropole Hotels we have stereotyped forms of balconies that break up the façades into horizontal parts without vertical supports. The old-fashioned stucco and paint, too, appear to hold supremacy in many of these towns. Along the Brighton front two or three innovations have been made, one by a terrace of large houses at the West-end, which serve to break agreeably the long line of white painted stucco. But the air of 18th-century respectability and correctness still lingers over George IV.'s marine residence, and the palatial squares and crescents seem to repel the less Classical and fashionable taste of brick Renaissance, with its angle turrets and gables. The experiment, at least, can hardly be said to have succeeded along the sea front, where there is such a predominance of the severer lines; certainly the freer and picturesque varieties make the contrast too violent. The bayed or circular-shaped front seen in some towns of this class, notably at Brighton, is a bold and welcome change on the straight front, as the lines of fenestration become varied, and the windows at the sides of the curve enable a wide prospect to be enjoyed. More might be made of this kind of elevation and that with splayed sides; but the builders of houses in these resorts are content to follow the traditional type of dwelling, without looking for better models. The building of seaside towns is purely a commercial or speculative concern, and architectural designs find little favour among local builders. The few good houses one sees are by London men, who, however, are ignorant of the essential requirements of seaside dwellings, and have made such glaring mistakes as to aspect, and to details like weather-proof casements, that the local builder profits by their deficiencies, and with exulting scorn points to the London architect's blunders.

THEATRES.—IX.

By ERNEST A. E. WOODROW, A.R.I.B.A.

SO far it has been my duty to explain the position of a theatre, its division, and arrangements of the interior of the auditorium. My next task is to endeavour to describe the means of entrance and exit to the street for each part of the house.

Every section of the auditorium should have at least two exits leading directly into the street, one or both of which exits being used as the entrance. Were it possible, it would be a great benefit to the public if every exit were also used as an entrance; for it is found that an audience will invariably depart by the way it came in to a theatre. Were the people, therefore, admitted by two separate ways to each division of the auditorium, there would, of a certainty, be insured a nightly usage of all the exits provided. A theatre may have as many exits in proportion to the number of people accommodated therein, and yet be sadly deficient of the necessary means of escape in the case of alarm or panic. Exits that are not known to, and cannot be easily found by, the audience are of very little service indeed; it is money thrown away to construct them. The way of escape should be so placed as to be most readily accessible by the audience; it should not be long or tortuous, and it should always lead directly into a public street, and not be met by any other stream on the way out. An exit must be "separate" its entire

length. I must at once, before going deeper into the question, refer to the London County Council's tenth regulation on entrances and exits, which reads as follows:—

"Two separate exits, not leading into the same thoroughfare or way, shall be provided to every tier or floor of such premises.

"If any tier or floor shall be divided into two parts, two separate exits, not leading into the same thoroughfare or way, shall be provided to each of such parts.

"Such exits shall be arranged so as to afford a ready means of egress from both sides of each tier or floor, and shall lead directly into a thoroughfare or way."

Now the last part of this regulation clearly calls for a symmetrical plan, with exits in corresponding positions on each side of the auditorium and on every tier, so as to afford a ready means of egress from both sides of each tier. Where that is carried out, anyone entering on the right, and seeing a similar door on the left marked "Exit," would naturally feel that they could find a way out, corresponding with the way in by which they entered. This point is briefly touched upon in Chapter II. of this series of articles (page 140, BUILDING NEWS of July 29, 1892); but its importance is so great in my mind I cannot refrain upon further notice of it, especially considering the demand contained in the rules which govern the London architect in preparing his plans. As I have elsewhere observed, it is clearly the duty of the architect to design his building so as to reduce the chances of panic to a minimum, and one of the chief provisions to this end is short and unobstructed exits. Everything in and about a theatre should tend to make the audience have confidence in their own security, and give them a feeling that, should anything happen, they would be able to help themselves without causing injury to others. Where people feel, or think, they are safe, the chances of danger are small. Simplicity in the plan, and uniformity in the two sides of the house, tend towards the solution of the difficulty. Thus, where there is a pit entrance on the one side, a pit exit should be found on the other; where there is a gallery staircase on the right, a gallery staircase should be found on the left, and so on for each tier or division of the audience. People—I repeat—as a rule, naturally desire to leave a building by the door by which they enter, and it seems it is only by making the two sides of a theatre alike that the public will find the exits provided. The audience should be taught the way out of a theatre by habit; to speak of "alarm exit," "fire exit," "exit in case of need," is only to encourage nervousness. The suggestions of danger should never be breathed in a building where human beings are packed.

The number of exits required in foreign countries for each tier of the auditorium varies but little from the dual system demanded by the London County Council. Italy, however, requires three exits from the pit, each delivering separately into the street; and in Hamburg, for every two hundred persons for which accommodation is provided, there must be at least one exit, while in Brussels a width of exit of 3ft. 3in. is required for every one hundred persons.

In Austria it is enacted that the exits must be of such a number as to allow the theatre to be emptied in four minutes, and the size of the doors is specified to be at least 4ft. 10in. wide by 9ft. 8in. in height. 1ft. for every seventy persons is the basis for the calculation of exit space adopted in Glasgow; but where separate exits are provided for the different tiers, they must not be less than 4ft. in width. New York requires each exit to be at least 5ft. in the clear, and every theatre accommodating three hundred persons must have two such exits, and when accommodating five hundred persons at least three exits must be provided for every additional hundred, or part of a hundred; above this an increased width of 20in. must be allowed.

The Boston regulations as to exits should not be overlooked. In this city the audience-hall and each compartment, division, and gallery of every theatre must respectively have at least two independent exits; as far apart as may be. Every such exit must have a width of at least 20in. for every hundred persons which the hall, compartment, division, or gallery from which it leads is capable of containing, and no exit may be less than 5ft. wide. Every theatre in Boston must have a frontage as wide as the widest part of the auditorium, including side

passages and lobbies, the whole width and height of which frontage must be on a street or area open to the sky, and at least 30ft. wide opposite the entire frontage. In this frontage there must be at least one exit, in no case less than 5ft. in width, with such greater width as an allowance of 20in. for each one hundred persons which the building may at any time contain, will, in the aggregate, be required. There must also be another independent exit of the same capacity, or independent exits of the same aggregate capacity, to a place open to the sky. This arrangement, I take it, holds good for each "compartment, division, and gallery of such building," as aforesaid.

Sir Eyre M. Shaw sums up this question by saying that "in at least one country on the Continent the rule is that two exits are required to be provided for 300 persons, and three exits for 500, and the principle of making not only the size, but also the number, of exits bear some recognised proportion to the audience is decidedly a good one, and might with advantage be adopted here."

So much detail is apt to become confusing; but the importance placed upon this question by other countries demands our undivided attention, in order that we may the more easily understand the spirit in which the rule of the London County Council, which specially governs the width of the entrances and exits to a theatre, is framed. No. 15 of the regulations enforces that "every staircase, landing, lobby, corridor, or passage intended for the use of not more than 400 persons of the audience shall be formed of fire-resisting materials, and shall not be less than 4ft. 6in. wide; but if communicating with any portion of the house intended for the accommodation of a larger number of the audience than 400 persons, it shall be increased in width by 6in. for every additional 100 persons until a maximum width of 9ft. be obtained." I am personally of opinion that it is not well to increase the width of an exit beyond 6ft., and should the numbers accommodated in any section of the theatre demand a further width of exit, that the number of exits should be increased rather than the width of the existing ones. This is especially the case in corridors and staircases, where, if an excessive width is attained, the people no longer have the support of the walls to prevent them falling and being trodden to death. The actual exit door itself, of course, cannot be too wide. I would rather see three exits of 6ft. each than two exits of 9ft. each.

In the report of the special committee of the Franklin Institute on the prevention of fires in theatres, which is dated April 18th, 1893, a series of rules were presented, the first of which bears directly upon the question of exit, and which I think should receive our special notice. It reads that "all corridors should increase in width from the theatre to the open air." This, of course, requires that the external exit doors should be wider than those by which the audience pass from the auditorium into the corridors, and is a further development of the principle advocated in the last chapter with regard to gangways widening towards the exit.

I mentioned above the desirability of making all the exits serve as entrances, when carrying out the rule of a dual system from all parts. This, however, would, while entailing duplicate entrances to each division of the audience, demand a double set of pay-boxes, money-takers, check-takers, &c., and would so increase the working expenses of the house as to practically forbid its adoption in small theatres. I think the practical remedy is the adoption of the symmetrical plan. In large theatres, such as Drury Lane, where there are two entrances to the pit, one is frequently used as an "early door," where admission can be obtained sooner than at the ordinary entrance, by the payment of a higher price. This is a managerial arrangement which only affects the architect in so far that it is well to provide a pay-box to each entrance, which is also an exit, in order to meet the requirement of a special entrance under such circumstances.

It has been my object, so far as my knowledge has allowed me, to draw the attention of the readers of the BUILDING NEWS, in these articles, to the views of the various authorities upon the individual details which we have had from time to time under review in the preceding chapters. It will be seen from the above that the views which all authorities have with regard to the vastly important question of exit appear to be the

same on principle, and differ only as to degree. I have, however, to consider other opinions before leaving the subject. Sir Eyre M. Shaw says that the external street approaches should invariably be kept free and unobstructed, as they may at any moment be required for a rush of the audience, and such of the inlets as also form the exits should be not less numerous than the internal divisions of the auditorium, according to prices. Each inlet should be easy of entrance at its outside point, well lighted, free from small projections or obstructions likely to cause injury, quite free from steps at any point where a crush is likely to take place, and gradually narrowing to the width of the narrowest internal passages through which the visitors have to reach their seats. The same writer remarks that: "The means of ingress and egress are not at present" [1876 is, I believe, the year in which these remarks were made] "what they ought to be is abundantly shown in many theatres by the practice of having a light piece to play the audience in, and another to play them out, a practice which, as far as can be judged, seems to have arisen solely through the difficulty experienced in filling and clearing the place when there is no panic. Where this is not done a large portion of the audience leave their seats before the conclusion of the performance, to avoid the inconvenience and delay of having to join the crowd in corridors and passages too small for the purpose." Since this was written matters have somewhat changed, and I do not think the custom of playing "curtain raisers" is so universal now; from which it may be perhaps judged, according to this argument, that the ingress and egress to theatres have improved of late years. At any rate, such is the popular belief, which, I think, is well founded, and trust may not be mistaken. My personal knowledge does not lead me to speak fully of provincial theatres.

Another writer, speaking of exits, remarks that the safety of an audience depends more upon judiciously-arranged means of egress than upon any precautionary system of fire appliances or fire-resisting construction: panic may develop itself at any moment without adequate cause. False alarms and imaginary fears may be productive of a more serious panic than the presence of real danger. "There should be means of escape from the building sufficient to withstand the sudden and extraordinary pressure of a stampede without the exits becoming congested." It has been pointed out that one man alone in topmost gallery would naturally run downstairs to the open air, on the call of alarm, without injury, and that provision should be made for a similar safe exit for a crowd—a difficult problem.

The usages and customs of a London theatre compel the mixing together of certain sections of the audience in one common vestibule, or entrance hall, whether for ingress or egress. For instance, it is customary for the stalls, dress circles, private boxes, and upper circle, to enter by the main entrance, to which is usually attached a spacious and somewhat attractive hall or vestibule, which is used as one of the exits from these parts, each of which, however, should be provided with an additional and separate exit into the street, apart from that passing through the vestibule. The mixing of any two or more sections of the audience within the building is a bad custom, and to avoid any difficulties of egress through a common entrance vestibule, the London County Council's eleventh regulation appears to have been framed.

"Where vestibules are provided not more than three tiers and floors (or where such tiers or floors are divided into two or more parts, such parts of tiers or floors) shall communicate with one vestibule.

"The width of each vestibule shall be at least one-third greater than the united width of all the doorways and passages that lead thereto.

"The united widths of all the doorways or passages that lead from a vestibule towards a thoroughfare or way, shall be at least of the same width as such vestibule."

The necessity of providing exits through a common crush room or vestibule, where the better class of people who frequent the theatre may wait for their carriages, is obvious. The above regulation should secure an uninterrupted exit for each division.

The New York regulations provide a common place of exit and entrance for the main floor of the auditorium and the first gallery, provided the capacity be equal to the aggregate capacity of

the outlets from the main floor and the said gallery.

In St. Petersburg the vestibules must be spacious and surround the *parterre* on three sides, with sufficient number of exits without internal lobbies, the exterior lobbies must be spacious and not less than 7ft. wide. The collective width of the exits on the outside from the vestibule must not be less than 4ft. 8in. for every 150 persons accommodated. In Paris the total width of the openings communicating from the passages to the vestibule must not be less than 19ft. 7in. for theatres containing 1,000 persons, or less. The external doors from the vestibule to the street cannot be less than three in number, with a minimum width of 8ft. 2in. each. Where a theatre contains more than 1,000 persons, 1ft. 11½in. has to be added to this for every additional 100 seats. So far, I have dealt with the question of exits, apart from the consideration of passages, staircases, and corridors—this must follow, as also the special means of arrangement needed in entrances, apart from exits, which will be my next consideration.

"BUILDING NEWS" DESIGNING CLUB.

A SMALL SHOOTING-BOX.

VULCAN is first, "Nil Nisi Bonum" is second, and "Smilash the Goth" comes in third for this subject, which is the last of the 1891-92 series. Now we shall proceed to go over the work of the session, so to speak, and see whose points of merit determine the award of the prizes which we offered.

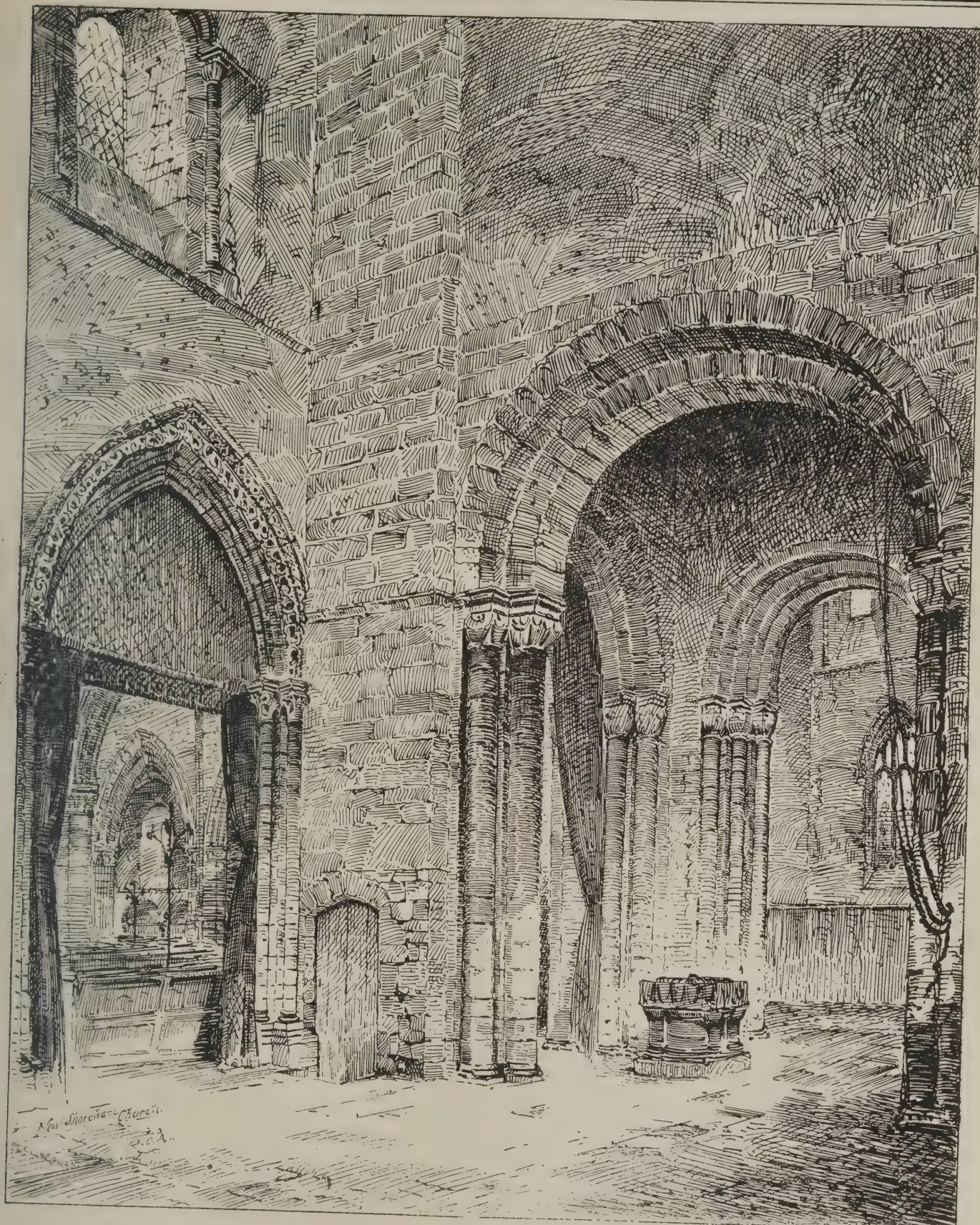
The following are the conditions printed for the guidance of the competitors:—

A gentleman's small shooting-box, for site on a Scotch Moor, to be built of stone and roofed with slate. The ground line of the land is presumed to fall one in ten from the N.W. to S.E., the latter being the aspect for the front of the house. The accommodation to provide a good porch and entrance hall (12ft. wide), one living-room 24ft. by 18ft., or of that area, and adapted for billiards. A small smoking-room and a gun-room, kitchen and offices, five best bedrooms, and two servants' rooms. No half-timber to be used, and an exposed position is contemplated. Scale, 8ft. to the inch. Two plans, two elevations, section, and view. Plans, if desired, may be 16ft. to the inch. The game larder to be detached from the house.

"Vulcan," in point of style, shows a knowledge of old Scottish work, and the difficulty of obtaining quaint conceits or special detail executed away from everywhere on a Scotch moor has been kept well in mind. The exposed position, too, on such a site necessitates a very simple type of work; while the local mannerism adopted by the author in his composition, if not strikingly original, seems appropriate. The porch screens the hall from the driving rain only moderately well, having openings on its three external sides; and, moreover, as the hall only obtains light from windows opening into the porch, it would not be so light as might be desired. The staircase, too, would gain by having a more decidedly extensive window. In section its size seems ample; but the plan shows a sash similar in width only to those of the living-room. The servery passage also might have had more light with advantage. In a general way we like the plan, and should like it better but for some matters affecting the lighting, as in the points above, or on the bedroom floor, where the lobbies look rather dark. The bedrooms hardly accommodate the beds, as drawn, so well as could be wished, except perhaps in the chamber over the porch. In this room, however, the door opens uncomfortably on to the landing. In the others the bed, considering the area of the apartments under notice, is needlessly close to the doorways. The servants' bedrooms are much better in this respect.

"Nil Nisi Bonum" is decidedly more out of the ordinary in style, and aims, not without a degree of success, at originality. Unfortunately we cannot add that the composition is quite so satisfactory in plan as others which are, perhaps, less original. In a small house, particularly one conceived on a square, long passages are extremely inconvenient. Take the entrance and notice how the servant in admitting visitors must insure all coming into the hall before she can get past, or else the door must be shut in their faces to permit of her going back into the house. Then observe that immediately facing the front door stands a blank wall, a most ugly arrange-

ment, as anyone can see. Again, every time a person calls, those in the house passing from the living room to the first floor have to do so by way of the narrow passage just referred to. Upstairs we reach a long ugly passage leading up to the w.c. door before any of the bedrooms are reached. The rooms are too awkward in shape for sleeping apartments, excepting the one over the living room. The w.c. out of the hall occupies the place which a stranger might mistake for the entrance porch. Externally the elevations are curious, and the little lead flat to the rear of the tower seems but a poor expedient. There is, notwithstanding, a quaintness which at least gives an interest to the composition, and it might, if built, look suitable. We do not say that it is suitable, and, indeed, both designs are rather too ambitious in character. "Smilash the Goth" makes his house too much like a villa intended for the southern parts of England. This is a very common fault with other competitors, few of whom have entered into the spirit of the proposal quite so freely as we could have wished. The wind and sweeping rains on a Scotch moor would soon wreck some of the flimsy and fanciful cottage-orné-like dwellings of which plans have been sent in. What is wanted really are thick walls, and very strong, simple roofs, capable of weathering any storm. "Smilash the Goth" is never, however, careless in important matters, and he has given us in the main a really good house, if only our site had been elsewhere. The w.c. out of the porch is a mistake. The smoking-room in a shooting-box might have led out of the hall, so as not to have rendered it necessary for a smoker on a cold night to come into the open porch before going to bed. True, the verandah connects it with the living-room, but that on a pouring night, would also be a very wet place. There is too much glass in the living-room for such a district, nearly all one side of the apartment being occupied by window. The carvings to the façades are needless. The interior panelling is in good taste and pretty. "Unitate Fortior" sends a capital plan; but it has one serious fault—a dark hall and darker landing upstairs. With a little modification of the gun-room, which is a mere lobby, and the staircase windows both back and front, this objection might have been obviated. The elevations are commonplace, and details of the plan are thoughtlessly contrived. Examples of this are a seat in the vestibule, cutting into the steps up to the hall. Either it must be 2ft. or 2ft. 3in. high, or the top step must be above the seat at the upper end. The chimney corner is in the darkest part of the living-room, and being immediately located between the servery and main doorways, is absolutely without comfort. "Black Prince" has improved. His house would be more at home in Surrey. The gun-room in the centre of the house is not a good position; but for an ordinary residence, the arrangements leave little to complain of, seeing that a drawing-room was not asked for. "Symbol" is neat, and makes a fairly convenient plan, but parapets with narrow gutters are best avoided, and the attics would be very cold. "Sphinx" gives solid walls throughout, but the long passage on the ground-floor is a poor affair. Outside the treatment looks flimsy. "Supervision" is plainer, but ineffective in his design. The kitchen door facing the main entrance is a fault, and the wasteful landing as big as the hall is another. "Clansman" furnishes a dwelling of merit, but it is not a shooting-box adapted for Scotland. The south-east front is pretty with the coupled bays. The flower balcony between is all very well, but destroys the privacy of the two principal bedrooms entirely. "Q. E. F." means to be solid in his work, and with more "go" in his elevations, his design would have taken a better place. We commend him for the simplicity of the entrance-front, which would do well enough, and looks likely to be a success, if executed. "B," in a circle, makes his house look too tall, and it is adapted for a suburban site. The elevations with stepped gables, drawn in brown ink, display taste, but not suitability, for our shooting-box. "Rosenberger" puts himself out of court by ignoring the club rule as to the size of paper to be used. His plan is original and uncommonly quaint, displaying evidence of capability, as do the elevations; but his perspective is quite unworthy of such a designer—indeed, it spoils his work.



We shall hope "Rosenberger" will again contribute, and follow the rules of the club more closely. The other designs come in the following order of merit:—"Ajax," "St. Hughes," "Cottager," "Ivanhoe," "Black and White," "Wyandotte," "Neufardi," "Phoenix," "Yorkshire Tradition," "Box," "Sweet Auburn," "Old Postage Stamp," "Sector," "White Rose," "The Baron's Dwarf," and "Peterborough."

The town council of Weymouth have decided to seek Parliamentary powers to borrow £20,000 for the development of the harbour.

NEW SHOREHAM CHURCH, SUSSEX.*

THIS sketch, taken from the north transept, shows the Norman work of the crossings, and a peep into the elaborate Early English choir. New Shoreham Church was probably erected about 1100, and contains examples of Norman, Transitional, and Early English architecture, besides additions in a later style. When complete it must have been a stately edifice, with a bold cruciform plan. The nave has long been

* We gave a measured drawing of the east end of this church, by Mr. Maurice B. Adams, in the BUILDING NEWS of July 28th, 1871.

destroyed, but substantial evidences of its pre-existence remain. The portions of the church now remaining comprise choir, with side aisles, transepts, and tower. Externally the walls of the choir rise higher than those of the transept, two massive flying buttresses supporting the groined roof.

R. OWEN ALLSOP.

The Chiswick Local Board have applied to the Board of Trade for their sanction to a contract with Messrs. Bourne and Grant for the electric-lighting of the parish, and the contractors are ready to proceed.

PHOTOGRAPHS IN PALL MALL.

THE Photographic Society of Great Britain opened last Monday their annual exhibition of photographs in the galleries of the Old Water-Colour Society, and we may say at once that the collection compares favourably with previous gatherings. The architectural subjects, however, do not strike us as being so important as in previous years either in numbers or in the novelty of interest in the buildings chosen for representation. Mr. J. B. Scott shows an interior of Carlisle Cathedral by a collodion print taken direct from the building. The view represents the vast east window and the choir, but the picture seems wanting in brightness. Mr. Harold Baker is far more happy in his two capital groups entitled "A Few Old Buildings," which include such specimens of historic Domestic architecture as Compton Wynnyates, Warwickshire; Woolas Hall, Worcestershire; and Somershall Herbert, Derbyshire, three charming old dwellings always worth illustrating. He shows a few good interiors, some of which we recognise; but as the subjects have no titles one or two are difficult of identification. Colonel J. Gale obtains a medal, which he richly deserves, for "The Incoming Tide," and sends other admirable studies, such as "A Cottage Doorway" and "Flatford Bridge." Mr. C. Essenhigh Corke, of Sevenoaks, is well represented by some of his beautiful photographs of Knole Park, Kent, some of which we have already illustrated. The whole collection makes a valuable addition to an architect's library. Medals are deservedly awarded to Mr. H. Yeo's subject-picture, "Blowing Bubbles," and Mr. A. R. Dresser takes another for a view of Aylesford. Mr. Harry Tolley exhibits a masterful print of "Limestone Rocks in Derbyshire," and near this another, called "Out of the Marsh a Fir-tree Grew." The grand salon of the Vatican Library is the subject of an unsurpassed bromide enlargement by Mr. Henry Little, showing the arabesques and mural paintings, as well as the splendid exhibits in this national museum, to great advantage and in the fullest detail. The same artist sends a view of St. Peter's, Rome, and a similar, but more specially interesting, study of the south end of the roof of St. Mark's at Venice, giving a bird's-eye group of gables, pinnacles, and skylines. Close by this last frame is a triptych series of smaller photographs, by Mr. Richard Keene in his best manner, of Dunfermline Abbey, showing the north porch, an interior from the N.W., and Major Bruce's tomb by Foley. The first named is exquisite for artistic spirit and treatment of light and shade. Dr. T. H. Morton contributes a set of views from Canterbury Cathedral, including all the familiar points of interest; and Mr. S. Bourne exhibits a big picture of Calder Abbey from the east, illustrating that ruin and the surrounding trees with appreciative skill, making quite a telling picture. "Tired Out," by Mr. H. Stevens, is a character study of a cat and dog fast asleep, which at once appeals to popular fancy, while as a piece of technical photography it deserves special mention. "Worn Out" is a medal picture by Mr. J. E. Austin, taken direct with a spectacle lens. An old man is critically examining an old Dutch clock, and his expression clearly indicates that it is a case of "No go." Mrs. Main secures a medal for six Alpine snow scenes, called "Frost and Sunshine," and no doubt her work is as good as it can be. Mr. A. Kemp obtained a rare specimen of character in the model of "My First Love," an ancient dame of many summers now far advanced in the late autumn of life, and therefore possibly all the fresher in the memories of her distant springtime. Messrs. Elliott and Son show a remarkable green carbon enlargement of a seascape, 7ft. long by 5ft. high, from a whole-plate negative by Birt Acres. It is a study of the waves rolling—

"Break, break, break,
At the foot of thy crags, O sea!"

It is pieced up in three sections, but makes a very remarkable specimen of photographic art, and has easily obtained a medal. The ruins of Netley Abbey furnishes Mr. W. Scorer with a picturesque subject for his fine big view (285), and the same hand sends a large platinum-toned view of Portsmouth New Town Hall, showing that very dignified copy of its prototype at Leeds to great advantage. In reality, the close proximity of the overhead railway almost touching the building seriously mars the Classical repose of the edifice; but this is avoided in the

picture here given. Mr. W. Thomas contributes a lot of small prints which interested us particularly. "An Old-time Garden," with its formality, cut yews, and terraced wall, showing the old manor house hard by. The title is missing, but no doubt remains as to its thoroughly English character and admirable suitability for much that makes the charm of an historic, artistic home. As a striking contrast to this reposeful garden is the landscape gardener's naturalesque showpiece in Mr. Alfred Rothschild's grounds at "Halton," Tring, Herts (286), depicted here so well by Mr. H. Bedford Lemere. The Mansion is an expensive house done in the French chateau style, designed and built by Messrs. Cubitt a few years ago. By way of a formal conceit in the lawn by the side of the park-like approach to the house, we noticed a vast, half-basket-shaped bed some ten feet over, and heaped up to give the rounded form, with a real wicker bottom and handle, the side of the basket form being built up of a series of *Echeveria secunda glauca*, set out to imitate the woven diaper of a basket. In the head of this basket-bed are planted a wealth of all kinds of flowers, growing, of course, at right angles to their supposed container. Handel's Organ in Little Stanmore Church, near Edgware, is represented by Mr. J. H. Gear. This organ was erected by Jordans for the Duke of Chandos, who employed Handel as his Chapel Master, and rebuilt Stanmore (Parva) Church in 1718 in the "stately pompous and uncommon" Classic of the Early 18th century.

"On painted ceilings you devoutly stare,
Where sprawls the saints of Verrio and La-guerre."

Thus wrote Pope in satire, but no doubt La-guerre and Bellucci did decorate the church, though Verrio died ten years too soon. The organ stands in a chamber behind the altar, forming a recess the whole width of the chancel. The opening is, however, only little wider than the altar. The idea for a church is theatrical, but musically the effect is soft and sweet. Handel composed "Esther" here and 20 anthems on this organ. Mr. C. Court Cole, of Oxford, sends a first-rate series illustrating the windows of Christ Church Cathedral, some of which we hope to illustrate shortly. Herr J. B. Obernetter, of Munich, sends some photographs from Albert Durer and Rembrandt's drawings and etchings, which are highly interesting, and the Autotype Company show another of "Christ in the Carpenter's Shop," from the mural painting by Mr. W. B. Lance, which we illustrated on Feb. 5th last from St. Mary's School, Wantage.

A NEGLECTED CHAPTER OF ARCHITECTURAL HISTORY.

THE names of Alan of Walsingham and William of Wykeham are familiar to every student of English architecture. Each was an ecclesiastic of high rank—Walsingham was Prior of the great convent at Ely, and Wykeham was Bishop of Winchester. And each was an architect who really designed and executed the works which bear his name, and did not, like so many other Mediæval ecclesiastics, simply get the credit due to nameless artists who worked under his nominal control, or worked with money which he had given or bequeathed. Alan of Walsingham actually designed and constructed the famous lantern over the crossing of Ely Cathedral, and the beautiful Lady Chapel which adjoins the church, while the architectural record of Wykeham is as well attested and covers a much wider field. When, at the age of twenty-three, he was first presented to King Edward III., this priest already had a tested skill in architecture; at the age of thirty-four he was given charge of all the royal works at Windsor, where he built the new ward of the castle and the chapel for the Order of the Garter; he renovated many other fortresses and constructed a new one at Queenborough at the mouth of the Medway; while Dean of Saint-Martin's-in-the-Fields in London he rebuilt his church (where the Post Office now stands); and while Bishop of Winchester he reconstructed the nave of his cathedral, and built, as well as paid for, Winchester School and New College in Oxford.

Walsingham's work was done in the second quarter of the 14th century, when the Decorated style had passed into its second or "flowing" stage. Wykeham, who was born in 1324 and died in 1404, was the most active agent in the

establishment and early development of the Perpendicular style. Both, therefore, belong to the later period of Gothic art, and when this fact is remembered, the figures assume a typical significance. In addition to their personal interest, as the figures of great architects, they have a representative interest as illustrating the English architectural profession in their time, and as enabling us to compare it with the French architectural profession of the same time. And such a comparison broadens and deepens in significance as we grow to understand that it illustrates the whole course of Mediæval architectural development in the two countries, and that this, in its turn, illustrates broad national developments in the most striking way.

The names of Walsingham and Wykeham show that, down to the very last days of Gothic art, a state of things existed in England as regards the erection of great buildings which had ceased to exist in France centuries before; and when we ask the reason, we find it in the different political and social conditions of the two countries.

Look into every French history of Mediæval architecture and you will find it arranged under two general heads: *L'architecture romane* and *L'architecture gothique*, or *ogivale*; and in English books you find these same headings: Romanesque Architecture and Gothic, or Pointed Architecture. But certain other corresponding terms are used in French which are never used in English. In French we constantly find *l'architecture monacale* used as a synonym for *l'architecture romane*, and contrasted with *l'architecture nationale*, which is a synonym for *l'architecture gothique*; and the latter is always referred to as the work of *architectes laïques* (lay architects). But in English the terms "monkish architecture" and "national architecture" have no such accepted significance, and I do not remember ever to have met with the term "lay architect."

We cannot be surprised to find that the main points of unlikeness in the Mediæval stories of France and England lie embalmed in this dissimilar architectural terminology; for architectural history, all commentators are ready to tell us, is the plain record in stone of those same facts of inheritance, influence, desire, and aptitude which stand out prominently upon written records. Nevertheless, while French general historians rarely neglect to illustrate their chapters by references to artistic developments, and while French historians of architecture carefully and fully explain its dependence upon political and social conditions, English authors have by no means done the same. Among writers of English, few general historians, except Prof. Freeman, have laid stress upon architectural facts; and, so far as my reading extends, no historian of architecture has traced the relationship between English national life and its artistic developments, or has attempted to contrast the different social influences which worked upon architecture in France and in England. This is my excuse for offering the following very brief and fragmentary sketch, which, I trust, another hand may elaborate, as I am sure it deserves to be elaborated.

When the Frankish hordes swept over Gaul, Roman civilisation was not wiped out. The old Roman centres of population survived; the old cities lived through the tempest, although, of course, physically and intellectually, in a shattered condition. They naturally remained what they had naturally become—the centres of the Christian faith; and there was never such a break in the life of the French Church as there was in the life of the British Church. In Britain, all memories of Roman rule, and all relics of British-Roman civilisation, were swept away in the deluge of heathen Englishmen (Anglo-Saxons, we often call them), who remained heathen until—a century and a half after their first landing—St. Augustine and his monkish missionaries came from Rome to preach Christianity afresh. Only a very few of the greatest towns, like Lincoln and York, still continued to exist. The new rulers often had not even a nominal capital. They were rulers of tribes, not of districts; and while the early Christian bishops of Gaul had naturally seated themselves in the old municipal centres of temporal power, the early English bishops seated themselves as nearly as possible in the geographical centres of the tribal settlements they were to evangelise—occasionally in the wreck of a town, more often near some isolated missionary monastery, and sometimes in a savage spot where a monastery or a great

collegiate house grew up around them. Thus, while we always find a French cathedral standing in a city which has some importance now and once was very important, we often find an English one encircled by a town to which it first gave birth, and which may or may not since have grown into greatness. Little Wells and Ely, considerable Lichfield and Salisbury, and big and busy Durham—all alike are the direct creations of cathedrals which were founded amid wild and desolate surroundings.

The municipal organisations which thus played a so much greater rôle in early France than in England, continued to play a similarly important rôle all through Mediaeval times. For a long period the history of what we now call France is a history of rival, warring towns and dependent districts; while the contemporaneous history of England is a history of rival, warring parties, without definite local affinities.

But in the general riot and darkness which marked the ruin of Charlemagne's empire and threatened once more to extinguish civilisation, the cities of France were eclipsed for a time, while the schools which Charlemagne had founded in connection with ecclesiastical establishments survived where these establishments lay a little aside from the great currents of internecine strife, and became the only nurseries of religious and secular knowledge. Then, in the very darkest moment of all, toward the end of the 10th century, when the world was waiting, affrighted, for its predicted end in the fatal year of 1000, the new monastery of Cluny was founded; and all through the 11th century its great hearthstone of intellectual life glowed more brightly than any in Western Europe. In the monasteries, and nowhere else, were libraries and schools, workshops of art, and laboratories of science; and from them, and especially from Cluny, went forth the men who, as the land began to calm itself a little, taught the burghers of the towns and built their churches for them. So the architecture of this period, the Romanesque period, is rightly called *l'architecture monacale*, as developed and exclusively practised by monks.

But gradually, thanks to the efforts of these monks, intellectual life began to awaken in the towns. It quickly meant a passionate protest against the iron hand of feudalism, a passionate desire for liberty; and in men of semi-Gallic blood, strongly tinged by Roman influences, this desire naturally expressed itself in struggles to secure a measure of civic autonomy.

Feudalism never pressed so heavily upon England as upon France. There the great nobles never became so powerful that the king was simply the greatest among many who openly defied his authority; there they never stood so thickly between the people and the king that local matters seemed all in all, and national consciousness scarcely existed; and there no old traditions of civic importance and independence persisted. The men who faced King John wanted, not to be free burghers, but to be free Englishmen; local interests were not made prominent; what they accomplished was done for the realm at large; and barons as well as bishops were their natural leaders. But the burghers of France faced, not the king, but their local *seigneurs*; and what they wanted was to be citizens of self-regulating *communes*. There was a great barrier to be broken down in France before king and people could help each other, or even oppose each other; and this barrier was formed of the nobles, who opposed the people on the one hand, and defied the king on the other. The story of this period in the land we now call France is extremely interesting but extremely complicated. Four contestants are in the field; the burgher, the noble, the churchman, and the king; and they perpetually appear in new combinations, in a veritable kaleidoscope of changing alliances and resistances. But, in general, the burgher, the churchman, and the king each felt that the noble was his most dangerous foe; as a rule the king favoured, or professed to favour, the *commune*, at least until he thought it was getting too powerful in its turn and, unless the bishop was himself the temporary *seigneur*, he was the friend of his flock. We can see to-day that king, churchman, and burgher were all fighting together for the great result which St. Louis saw in the 13th century—a united nation whose *communes* should possess a fair measure of local freedom. But at the time it must have seemed indeed a welter of conflicting interests; and, of course, it was interests, not true sympathies, that brought

about temporary alliances, now of one sort, now of another. For example, as the monasteries were locally dissevered from the seats of Episcopal authority, so they sought to free themselves from Episcopal rule; increasing in power and wealth, worldliness and ambition, they tried more and more for an independence which would mean no over-lord but the Pope himself; and thus, to strengthen his arm against this enemy within the church, the bishop was again forced to labour for the burghers' advantage.

Meanwhile there were towns, of course, in England, and growing local interests and local oppressions and resistances; and gradually the townsmen claimed and won many new rights and privileges. But these were not usually political privileges; municipal matters were not bound up with broad national concerns as they were in France; and so, while the French burgher in his greater need used ducats and arms together, the Englishman could conquer with peaceful ducats alone.

Now let us see how these social facts expressed themselves in art.

In England the cathedral chapter was often monastic, and even when it was not it had an almost monastic size, dignity, and individuality. But in France, although a monastery might lie close to a cathedral town, it had no concern with the cathedral which stood in the heart of the town and was the core of its life, the focus of its interests, the property of its citizens, and, as the new order of things advanced, the work of their hands and the shrine of their liberties.

No great municipal halls existed in those days, and Frenchmen could not remember them, so wholly had the tradition of the basilica become the history of the place of worship, so entirely had architecture become the handmaid of the Church. On the other hand, great popular assemblages, held in-doors or out-of-doors, wherever the people might think best, were unknown even to farthest tradition in France; the noble institution of the folk-mote was an inheritance of purely Germanic peoples only. So when the need for large meeting-places arose in a French town, it wedded itself to the idea of the old architectural centre of the town, and the cathedral became not only the symbol but the actual fosterer of civic as well as of religious life.

Meanwhile, with the general development of wealth and intelligence, architecture began to stir itself for a new departure. The old Romanesque scheme, developed and practised by monks, was putting forth new buds, and laymen's hands were to unfold them. The earliest buildings which show the pointed arch used in what may be called a Gothic way were built by ecclesiastics, like the famous church at St. Denis, whose architect was the Abbé Suger. But the people soon learned all that the Church knew of science and art; their minds were more alert and plastic than the clerical mind; their hands were not cramped by semi-artistic, semi-ecclesiastical traditions; their spirit was fresh and vigorous; the new and larger churches which they wanted appealed to all that was strongest and best in their natures, and not to religious zeal alone; and so, with a mighty impulse, they took control of art, and an architecture which may truly be called an *architecture nationale* passed, in the brief space of fifty years, from its embryonic to its perfect state. Of course the bishop and the church at large were not ignored; but, while the bishop permitted and, perhaps, directed the building of the cathedral, a layman was its actual architect, guilds of lay carpenters and masons raised its walls, guilds of lay sculptors and painters and glass-makers adorned them, and the people chiefly paid the cost, and often men, women, and children together worked with passionate enthusiasm upon the structure which was at once the temple of their faith, the sign of their city's greatness, and the hearthstone of their liberties. Romanesque art—monkish art—was dead. Gothic art—national art, the art of laymen—had taken its place.

Thus local liberty and architectural art drew a fresh breath of life together, and developed hand in hand. And when feudalism had followed monastic architecture to the grave—when national unity and local freedom were finally achieved—art had its splendid share in the triumph. Gradually, as the kingly power extended over the provinces once ruled by rebellious vassals or rival princes, and as the *communes*, measurably content, ceased from local strife, cathedrals were built by the king's command,

and provincial manners of design, so strongly marked in the Romanesque period, gave way to the Gothic style, which had been born and developed in the old *domaine royal*. Cathedrals which are French structures in that strict architectural sense which gives to "France" its early and limited significance as denoting the *domaine royal* arose in all parts of what is the wide land of France to-day, planted, as a Frenchman had said, like royal standards of victory in every great annexed town. But, as this form of art had been developed by the *communes*, so it was the help of the *communes* which had enabled the king to triumph over the great provincial nobles, and thus the Gothic cathedrals which we see in places as far apart as Coutances, Bordeaux, Limoges, Clermont-Ferrand, and Narbonne were standards of the people as well as of the king, trophies of the popular struggle for freedom no less than of the royal struggle for power, proofs of national unity, but at the same time of the achievement of local liberties. Truly, he who reads this chapter of architectural history with care reads the life history of the people who wrote it.

As the corresponding English chapter is equally interpretative, it naturally has a very different accent. Where cities were of much less importance, where local matters had small political significance, and where episcopal chairs were set in the midst of great cloistered houses, the burgher had neither the need nor the chance to make cathedral-building his concern. Whatever part bishop or burgher might take in the great national struggle, he played that part on a national battle-field; the cathedral stood aside, built by its clerical owners, and serving these owners first, and the people only in a secondary fashion. Cathedral priests might quarrel and fight with the townfolk, but the townfolk did not question ecclesiastical supremacy within the cathedral itself, as did the burghers of Laon, of Rheims, and of many another French *commune*. The clergy of England owned its cathedrals as truly as those great abbeys which contained no episcopal seats. Naturally the people must have taken a pride in them, and may have helped a little in their construction. But their interest must have been of a simply religious sort, and we are not told that it ever approached that frenzy of enthusiasm which is shown by the oft-told story of the building of the Cathedral of Chartres. The fact seems to be that, down to the very latest days, the bishop, the abbot or prior, and the "house," practically bore all the cost of their church; the enterprise was theirs, and the glory was theirs; and from their own ranks they drew the executives whom they required. Of course, there were secular guilds in England too, and there may well have been some lay architects. But English historians of art take no notice of these guilds, so prominently described by French historians, and never attempt to draw a line between the work of churchmen and the work of laymen; and the guild of masons makes a very small showing even in general account of English trade corporations, while we know what we term "freemasons" meant upon the Continent. And, again, we have a long-extending if scanty list of English Gothic architects, not ending even with Walsingham and Wykeham, who were certainly ecclesiastics, and no list of identified lay architects to set against it, while in France clerical names cease entirely to appear after the dawning of the 13th century. The builders of Amiens in the early 13th century are well known by name, and they were laymen; and even William of Sens, who, at a much earlier day, brought the infant Gothic style across the Channel, came without frock or tonsure from the building of the cathedral in his native town to the building of the choir of Canterbury.

It is thus that such names as those of Walsingham and Wykeham assume a typical significance. They are the names of those who were the greatest architects of their land and day, generations after the arts of France had passed out of clerical control. And when we do not know the actual name of an English architect—when we simply know that some unspecified artist did the things which careless mouths attributed to some prior or bishop—still we must imagine him a local ecclesiastic of lower rank, not a layman like his contemporaneous brother across the Straits. There were probably, I say, exceptions in both countries; probably certain laymen worked upon the cathedrals of England and certain clerics upon the cathedrals of France. But we cannot perceive their figures

or trace their influence at this distant day. The great picture which history reconstructs for us in France is a lay profession assuming control at the very birth-hour of Gothic art, and in England a clerical profession keeping control until the very death-hour of Gothic art. So far as I have been able to discover, the first English cathedral which can be called a "national" work in the symbolic sense, which was the creation of laymen and not of the church, was Sir Christopher Wren's St. Paul's.

I think no impartial student of Mediæval architecture questions the immense superiority of French over English Gothic. It is a superiority which shows in every form and phase of the art, from the conception of the structural body to the last minutiae of carved or painted decoration. It speaks alike in a much loftier degree of constructional ambition, a much more logical grasp of constructional expedients, a richer desire for ornamental finish, a deeper imaginativeness in design, and a completer skill in technical execution. Not from one single point of view or from another, but when studied in any of its details French Gothic is at once a nobler and a more perfectly developed art than English Gothic.

Is the explanation to be found entirely in a difference between innate artistic endowments? Or may we read it partly in the differing developments of the artistic professions? Were English Gothic artists inferior to French Gothic artists simply because they were Englishmen, or partly because they were ecclesiastics? The relatively slow development of the English form of Gothic; its lingering attachments for Romanesque precedents, its inability wholly to throw off the traditions established by early clerical builders, to grasp the new structural idea conceived by the laymen of France, and to carry it boldly to its utmost limit; its timidity and lack of logic in constructional design; its deficiency in imaginative power and in technical skill as regarded decoration—may not these characteristics be plausibly traced, in part, to the fact that the Church was always the artist?

Church establishments were the only possible nurses of science and art in the early Mediæval years. But as the world outgrew the swaddling-bands of the Church in other directions they may well have pressed with hurtful force upon art. The ecclesiastic who was an architect could not, like his lay rival, be that and nothing more; nor could he so readily travel about, see what was being done elsewhere, and develop his artistic gift; nor could he train up his own children to follow in his path, as we know that certain great French architects did. He could not be a member of a well-trained, well-regulated profession in which each artist was bound by what others had taught him, what others were doing, what others were trying to do in novel directions. In later Mediæval days the secular guild must have been a much better nurse of art than the clerical house, because it bestowed more freedom on the one hand, and, on the other, better training, wider experience, stricter artistic ideals. When we know that even the Late Gothic architects of England were still ecclesiastics, we can better understand both the general conservativeness of English art and its occasional breaks into lawless individuality. We can better understand why the Gothic constructional scheme never fully developed, but a lingering Romanesque element always remained embedded in Gothic walls, and why no great school of sculptors, comparable to those which dowered so lavishly almost every province of France, grew up on English soil. And, on the other hand, we can better understand how, while a general, logical development, unmarked by strong individual eccentricities, went on in France, we find here and there in England such bold pieces of personal experimenting as the portico at Peterborough, the Galilee chapel at Durham, and the ornamental casing of the choir at Gloucester. There was a school of architecture in France, in the widest yet the strictest meaning of the term, and it was possible, because art was in the hands of lay corporations. There was no such school in England—may we not think, partly because art was in the hands of the clergy?

The absence of the broad and plastic, yet very logical, exact, and universally respected, incitements and restraints of a true school shows, I repeat, alike in the general conservatism of English Gothic and in its occasional lapses into bold, individual experiments. No church even approaching Amiens as a perfect, logical illustra-

tion of the Gothic ideal ever arose in England; but there is nothing in France which, for striking individuality, daring personality, approaches the portico of Peterborough. When we examine Amiens, we feel that a whole race of men of genius, carefully trained to work together without undue self-assertion, is revealed by its existence. When we examine the portico of Peterborough, we feel the presence of a single man of genius, who was not logically-minded, and, therefore, was not a very well-trained architect, and who worked without a thought of what anyone else was doing. The same impression is given by many other parts of English churches, except that we do not always feel that genius had a hand in them. And a similar impression is given even by the famous lantern of Ely Cathedral. Its idea was Walsingham's own—this idea of widening out the square crossing into an octagon, and crowning it with a domical roof. It was his own, and it was a truly logical, truly Gothic, and admirable idea, very different from the semi-pictorial, wholly illogical idea of the unnamed creator of the Peterborough porch. But its execution betrays a lack of logic in minor matters, and of perfect skill in execution, which we should not find had a similar idea been expressed by a French architect of the time. No French architect of the 14th century would thus have simulated a stone vault with wood, and none would have designed the narrower diagonal walls of the octagon in so weak and inorganic a way. The idea is very fine; the execution, I venture to say, is in some points amateurish. At Peterborough the idea itself, despite its imposing grandeur, is amateurish from the architectural point of view. And the same term often comes to mind when we study the great churches of England one by one, or contrast them all together with the great churches of France. Is it fanciful to think that this may be partly because, while French Gothic developed under the hands of laymen, and so became a truly national art, English Gothic developed under the hands of churchmen, and so never became in the same sense a national art?

Of course, there is another way of looking at the question involved. We may ask, not whether national aptitude was partially stunted in England by clerical control of the arts, but whether national inaptitude was proved by the persistence of this control? We may ask whether, had the English been a truly artistic people, they would have suffered their arts to remain in the hands of the clergy? If the 12th-century Englishman had been as artistic as the 12th-century Frenchman, would he not have felt an irresistible impulse to seize the helm of artistic progress himself, even though he was not prompted by that strong civic feeling which ruled in France—was not bound into ambitious, powerful communities by the local power of the nobles on the one hand, and, on the other, by the persistence of the old Roman municipal idea?

But, after all, it is not profitable to speculate upon possible aptitudes which never reveal themselves. The truest significance of the story of the development of Gothic art in France and in England is its proof of how vitally outside influences affect architectural development, how much more dependent it is upon what we may call sociological and what we are pleased to call purely æsthetic influences. Some may fancy that Gothic art developed as it did in France simply because the Mediæval French were a nation of great artists who cast about in their minds for an ecclesiastical ideal and then proceeded to realise it. But the careful student knows better than this. He finds that the first tentative steps to progress from a perfected Romanesque towards the perfected Gothic style were taken by clerical builders who were trying to discover more manageable ways of roofing their churches than by the use of the barrel-vault. Then he finds that, prompted by a newly acquired intelligence, a newly developed love of freedom, and a newly enlarged pride in their native towns, the burghers of France took art out of the hands of the ecclesiastics, just as they took the control of their private affairs out of the hands of their feudal *seigneurs*. Then he finds that, as space was needed in the cathedral nave for secular assemblages, the cathedrals were built much larger than before; and then, that, as each commune succeeded more or less well in its political ambitions, it grew ambitious in other ways, and, desiring to assert itself as the equal of any neighbour, clamoured for a cathedral which should surpass its neighbours' cathedral, and then he

divines that, as the burghers paid for their churches themselves, they naturally wanted to get as much display for as little money as possible. Finally he sees that when artists became laymen they could organise into lasting associations and yet travel about, learn what their fellows were doing, and work first for one commune and then for another, thus assuring the best chance of a rapid yet logical, homogeneous and uncentric development of art. The Gothic cathedral in its perfected form is a triumph of science and a triumph of economy as well as a triumph of beauty. And it became so because of the favouring pressure of political and social conditions. Similar conditions did not exist in England, and a similar result was not attained there. We may grant all the influence we choose to innate artistic aptitudes, and may as readily grant that, in all kinds of work in every age, Frenchmen have proved their possession of nobler artistic aptitudes than Englishmen.—M. G. VAN RENSSALAER (in the *American Architect and Building News*).

A NEW BRIDGE AT VAUXHALL.

AT Tuesday's meeting of the London County Council, a report was presented by the Bridges Committee, recommending the construction of Vauxhall Bridge and the erection of a temporary bridge. The report stated that Vauxhall Bridge was opened in 1816, built at a cost of £259,681, and purchased by the Metropolitan Board of Works for £75,000. The bridge was of stone and cast iron, and crossed the river by nine arches, each of 78ft. span, supported by eight piers, each 13ft. wide, above low-water level. The piers thus occupied about 104ft. of the waterway, or about one-eighth of the total width of the river between the abutments. The length of the bridge was 809ft., and its width between the parapets 36ft. 6in., having a carriage-way of 24ft., and two footways each 6ft. 1½in. wide. The gradient over the bridge was 1 in 35. The gradient on the Middlesex approach was 1 in 29, and that on the Surrey approach 1 in 30. A considerable improvement might be effected in facilitating the passage of heavy traffic over the new bridge by the reduction of the surface gradients to about 1 in 62, and by the adoption of wood pavement. The bed of the river in this locality was gradually deepening, and the ebb tide was dangerous to navigation. The traffic over the bridge had greatly increased. The bridge that the committee suggested should take the place of the existing structure was a five-arch steel bridge with granite-faced piers and abutments, the width between the parapets being 80ft. The cost would be about £380,000. To accommodate the traffic during the rebuilding of Vauxhall Bridge, the committee proposed that a wooden bridge, not less than 50ft. wide, should be erected, to cross from the extreme western end of the Albert Embankment to Millbank. The cost of the temporary bridge was estimated at £30,000. The report was adopted, with the addition that steps be taken to obtain from Parliament authority to raise an equitable proportion of such cost by an improvement rate on the owners of ground values in the county of London.

CHIPS.

Sir J. B. Maple has offered to present twenty-four acres of land to the city of St. Alban's, to be used as a recreation and cricket ground. The site is a field in Hatfield-road, now used for the holding of fêtes.

An exhibition of drainage and sanitary appliances is on view at Hornsey, having been arranged and brought together by the surveyor to the local board, Mr. T. de Courcy Meade, past-president of the Municipal Surveyors, &c., Association.

The council of the corporation of the Church House have been enabled to resume the building of the great hall, which was begun in June of last year, when the foundation stone was laid by the Duke of Connaught. The impossibility of obtaining possession of some houses remaining on the site caused an interruption in the work, but this difficulty has been overcome, and considerable progress has been made during the past month in excavating and preparing the ground for the foundations. The cost of the great hall, with the adjacent rooms and offices, is estimated at £40,000, towards which nearly £30,000 has been subscribed or promised. We illustrated the building from Sir Arthur W. Blomfield's designs in our issue of May 2, 1890.

CONTENTS.

Architects and Pupils	447
Many-Storeyed Buildings	448
Seaside Dwellings	448
Theatres.—IX	449
Building News Designing Club	450
New Shoreham Church, Sussex	451
Photographs in Pall Mall	452
A Neglected Chapter of Architectural History	452
A New Bridge at Vauxhall	454
The Building News Directory	454
Our Illustrations	455
Wayside Notes	455
Public Baths and Wash-houses.—III.	475
Obituary	475
Building Intelligence	476
Engineering Notes	477
Archaeological	477
Competitions	477
Correspondence	477
Intercommunication	477
Legal	479
Legal Intelligence	479
Water Supply and Sanitary Matters	479
Statutes, Memorials, &c.	479
Our Office Table	480
Meetings for the Ensuing Week	480
Trade News	480
Tenders	481

ILLUSTRATIONS.

SECOND AND THIRD PREMIATED DESIGNS FOR THE NEW MANCHESTER TECHNICAL SCHOOLS.—"BUILDING NEWS" CLUB DESIGNS FOR A SMALL SHOOTING-BOX.—NEW CLUB UNION PREMISES, HOLBORN.—SECOND PREMIATED DESIGN FOR THE COXLODGE LUNATIC ASYLUM EXTENSION, NEWCASTLE-ON-TYNE.—"THE CHILDREN OF THE WOLF."—CARDINAL MANNING.—TWO VILLAS AT SURBITON.—FITTINGS IN MR. DOUGHTY'S HOUSE.—THE SKETCH CLUB OF NEW YORK.

Our Illustrations.

MANCHESTER TECHNICAL SCHOOL COMPETITION.

THE selected design for these new buildings was illustrated last week in our pages by a view and plans. Herewith we publish drawings of the second and third premiated designs. By these means the relative merits of the compositions chosen by the professional referee, Mr. Alfred Waterhouse, R.A., for prizes can be readily compared by our readers, and no doubt the details of these plans will be useful to many who are interested in Polytechnic building. Having already given a review of the competitive designs, little remains to be said here, particularly now that the drawings which we reproduce to-day readily explain the main intentions of their authors. Messrs. Gibson and Russell won the second premium, and Messrs. Runtz and Farrow the third. Next week we shall give illustrations of the fourth premiated design, with further illustrations of the chosen design.

"BUILDING NEWS" CLUB DESIGN FOR A SMALL SHOOTING-BOX.

(SEE description on page 450.)

NEW CLUB UNION PREMISES, HOLBORN, W.C.

THE position for this central club-house adjoins, we believe, Holborn Town Hall, and the cost of the work, including the site, is officially stated at £16,000. A more convenient spot could not have been chosen. Outside the door run trams and 'buses to a late hour of the night, and a short walk takes the club member to Farringdon-street Station. Four floors and a basement comprise the front building, which is about 40ft. square, and above the caretaker's rooms are arranged. The ground floor will be occupied by shops and an office for the use of the union. The first floor will be devoted jointly for the committee of the union and the "Women's League," the upper floors being available for letting as private offices, and should readily be occupied in such a position of London. To the rear of the building shown by the architect's drawing, herewith reproduced, will be located the affiliated clubs' comfortable club-rooms, solely for the use of persons holding union pass cards. This is a new idea with many club-men, and is one that will commend itself to all progressive men. The liberal catering found in music-halls, theatres, and other places of amusement, has always met, we are told, with beneficial results, and the official report adds, "Give the club-men of London a central meeting-place, with everything

round them to make them feel comfortable, and there will be no lack of visitors. Now to clear up some misapprehension. It has come to our ears that some clubs in the centre of London are looking askance at the scheme, under the impression that their members will leave them to join the Union Central Club. Instead of drawing members away from the neighbouring clubs, there is much more likely to be an increase in their membership, as persons not belonging to a club, and wishing to join this, will be instructed that they must go and become members of an affiliated club." Mr. W. D. Caroe is the architect of the building.

THE NEWCASTLE-UPON-TYNE CITY LUNATIC ASYLUM—PROPOSED EXTENSION.

THE accompanying design was placed second by Mr. George T. Hine in the recent competition for the extension of the present asylum, and is arranged to accommodate 350 male patients, the female patients being provided for in the existing building. The wards are in four blocks on the S. side of the main corridor, and have throughout a southern aspect, every day-room and dormitory being cross-ventilated, the sick and infirm, recent acute, turbulent, and epileptic cases respectively occupying the ground floors, whilst the chronic, mild, and working cases are placed on the first floors. The administrative department is placed centrally between the old and new buildings for use in connection with both, and the general store and kitchen departments near the dining-hall. Suitable accommodation is provided for the assistant medical officer, steward, storekeeper, attendants, domestic servants, &c. The recreation-hall and chapel are separate buildings, placed between the male and female departments of the asylum. The medical superintendent's house is on the south side of the main corridor, and cottages for ten married attendants near the entrance. Suitable workshops and general delivery yard are provided, and an isolation hospital and mortuary are shown to the north. For the warming and ventilation, a system of propelling warmed fresh air, drawn from a height, into the various wards, corridors, &c., the vitiated air being extracted at about floor levels, and carried by shafts into the ventilating towers, is adopted. The estimated cost is £64,636. The authors of this design are Messrs. Montgomery and Carr, 42, Grainger-street, Newcastle-on-Tyne. We illustrated the chosen plan for this work in the BUILDING NEWS for Aug. 5th last.

SCULPTURE FROM THE ROYAL ACADEMY AND THE PARIS SALON.—"THE CHILDREN OF THE WOLF."

MR. GEORGE FRAMPTON'S striking group formed one of the most conspicuous features in the Lecture Theatre at Burlington House during this year's Academy Exhibition. The subject shows the twin sons of Sylvia, a vestal virgin, and the god Mars, Romulus and Remus, borne by the king's shepherd, Faustulus, who found them exposed in a boat on the river Enipeus. The herdsman took them to his wife, who brought them up, and it is said they slew Amulius, their great uncle, who had caused them to be exposed. The Greek legend of Tyro relates that she also had an amour with Poseidon, and that, as in the intrigue between Mars and Sylvia, two sons were born in consequence. The fable of the wolf suckling the outcast infants is wholly worthless, and as for the etymology of the word Rome, "we need no Romulus to account for Rome."—From the Salon we give the fine portrait statue of the late Cardinal Manning, by M. G. de Bengy-Puyvallée, of Paris. The archbishop, in the ample robes of his Episcopal office, holds the pastoral staff, the ensign of his jurisdiction, and is shown in the act of benediction.

TWO VILLAS, SUREITON.

THESE villas, which are well and substantially built, and are now close upon completion, have the fronts of red brick and natural colour cement, rough cast. Clear leaded pattern glazing has been used in the lights above transoms, &c., and the front door, which has been set back to form a porch, is glazed with plain stained obscure leaded pattern glazing. Each villa contains two reception-rooms, kitchen, and good offices on the ground floor; four bedrooms, bath-room (hot and cold), w.c., and cupboards upstairs. The decorations for the interior, though simple, have all been selected with a view to an artistic harmony. The rent has been fixed at £34 per annum each. A very slight modifica-

tion of the front has been made. The contract price was £776 for the pair; Messrs. Adkins Bros., of Surbiton, being the builders. The architect is Mr. R. Lano Pearce, M.S.A., of 100c, Queen Victoria-street, E.C., and Surbiton Hill.

FITTINGS IN MR. E. DOUGHTY'S HOUSE, NOTTINGHAM.

THE chimneypiece and dressing chest shown on this page have been recently executed by Messrs. Oldham and Knight, from the designs of Mr. Gilbert E. Doughty, architect, for "The Forest," Nottingham, the residence of Mr. Edwin Doughty. Little need be said, as both sketches explain themselves. The bath-room chimney-piece is simple and appropriate; and there is a pleasing and successful attempt, in the case of the dressing chest for bedrooms, to break away from the commonplace article of furniture that usually does duty in this respect. The arrangement of small drawers between the two cupboards is, we think, a good idea; and so also is the working-in of a space for a few select books in the upper portion, and the shelving for ornaments.

THE SKETCH CLUB OF NEW YORK.

THE chamber interior given herewith is a design by Mr. Frederick R. Hirsch, for which he was awarded the first place in the above competition. Whatever may be said against the old-fashioned four-post bedsteads closely curtained, on sanitary grounds, it is certain that for large apartments they bear a far better relative scale, and add a greater dignity to them. The great bed in this sketch is quaintly designed, and one can best appreciate its value by conceiving its place occupied by the more cleanly, but generally hideously ugly, heavy brass bedsteads of modern usage. Differences of opinion may exist on this point, but few will question the merits of the charming chest of drawers, divided in a novel manner into two parts, a handy cupboard taking the place of the usual small drawers. The high-back chair of Jacobean character is also appropriate, though, perhaps, less original than the other furniture. Our illustration is taken from an *American Architect* sketch.

CHIPS.

Alterations have been made to the council-chamber, Walsall, embracing the ventilation, which is now carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

Messrs. Prescott's bank, London, is being warmed and ventilated by means of Shorland's patent Manchester tiled stoves, the same being supplied by Mr. E. H. Shorland, of Manchester.

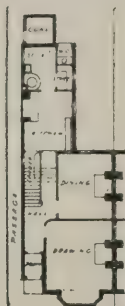
The foundation-stone of new national schools, Langley, Worcestershire, was laid on Monday last. When completed, they will accommodate 400 children. The architect is Mr. F. Boston, of Birmingham, and Mr. J. Light, of Langley, is the builder.

A meeting of the committee of the Archbishop Thomson Memorial Fund was held in Archbishop de la Zouche's Chapel, York Minster, on Friday, the Bishop Suffragan of Beverley (Archdeacon Crosthwaite) presiding. The meeting was called for the purpose of consulting Mr. G. F. Bodley, A.R.A., the architect, and of considering a new design submitted by him for a recessed altar tomb. This was ultimately accepted, subject to certain modifications, and the selection of a sculptor to execute the effigy.

At the last meeting of the Bermondsey Vestry it was resolved that an engrossed vote of thanks be given to Mr. George Elkington, F.R.I.B.A., in recognition of the courtesy, fidelity, and gentlemanly conduct exhibited by him during the 38 years he had held the office of surveyor. Mr. Elkington, in reply, expressed his thanks, and remarked that no member of the board was now living who was a member when he took office. He had always been proud to be associated with the vestry in doing what he could for his native parish of Bermondsey.

St. John's Brine Baths, Droitwich, the gift of Mrs. J. Dyson Perrins, were opened on Tuesday. The building is Gothic in style, and is situated in St. Peter's Walk. It comprises dining and sitting-room for men and women, kitchens and offices, matron's rooms, and bedroom accommodation for thirty-two patients. The architect was Mr. John Douglas, of Chester, and the builders were Messrs. J. Wood and Sons, of Worcester.

In the case of Charles Dart, of Saltash, Cornwall, builder, the discharge from bankruptcy has been suspended for four months ending Nov. 13, 1892.



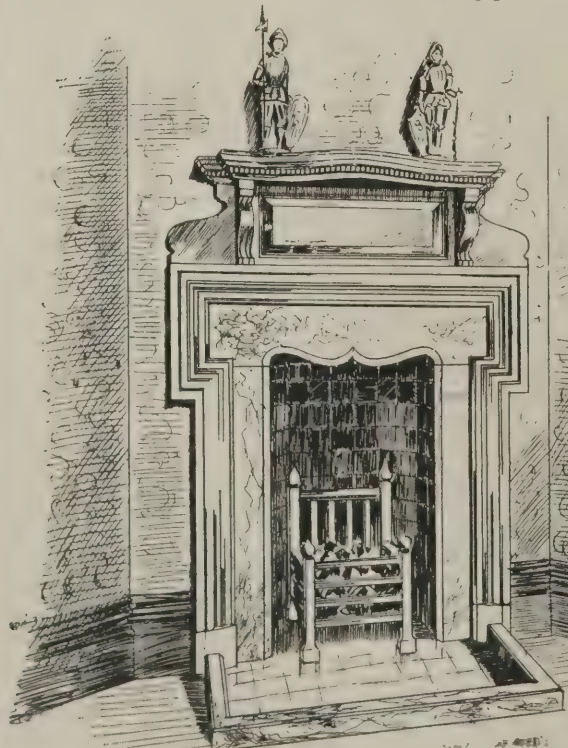
Semi detached Villas.
at Sunhill, Surrey.
Mr. Lano Pearce for Mr. Drands
Arch.
100° Queen Victoria S.E.C



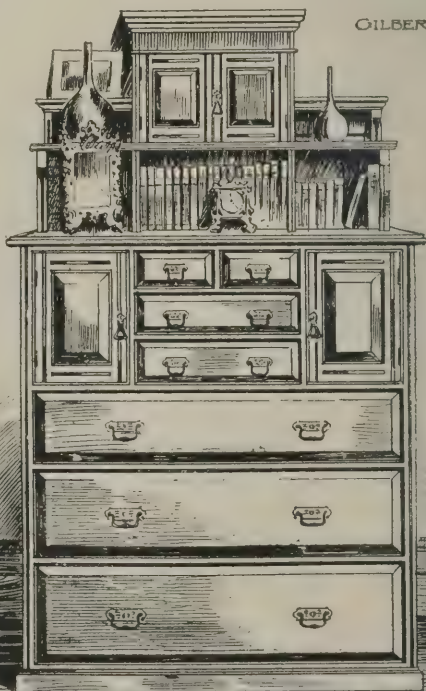
FITTINGS IN MR EDWIN DOUGHTY'S HOUSE "THE FOREST" NOTTINGHAM

DESIGNED BY

GILBERT S. DOUGHTY
ARCHITECT

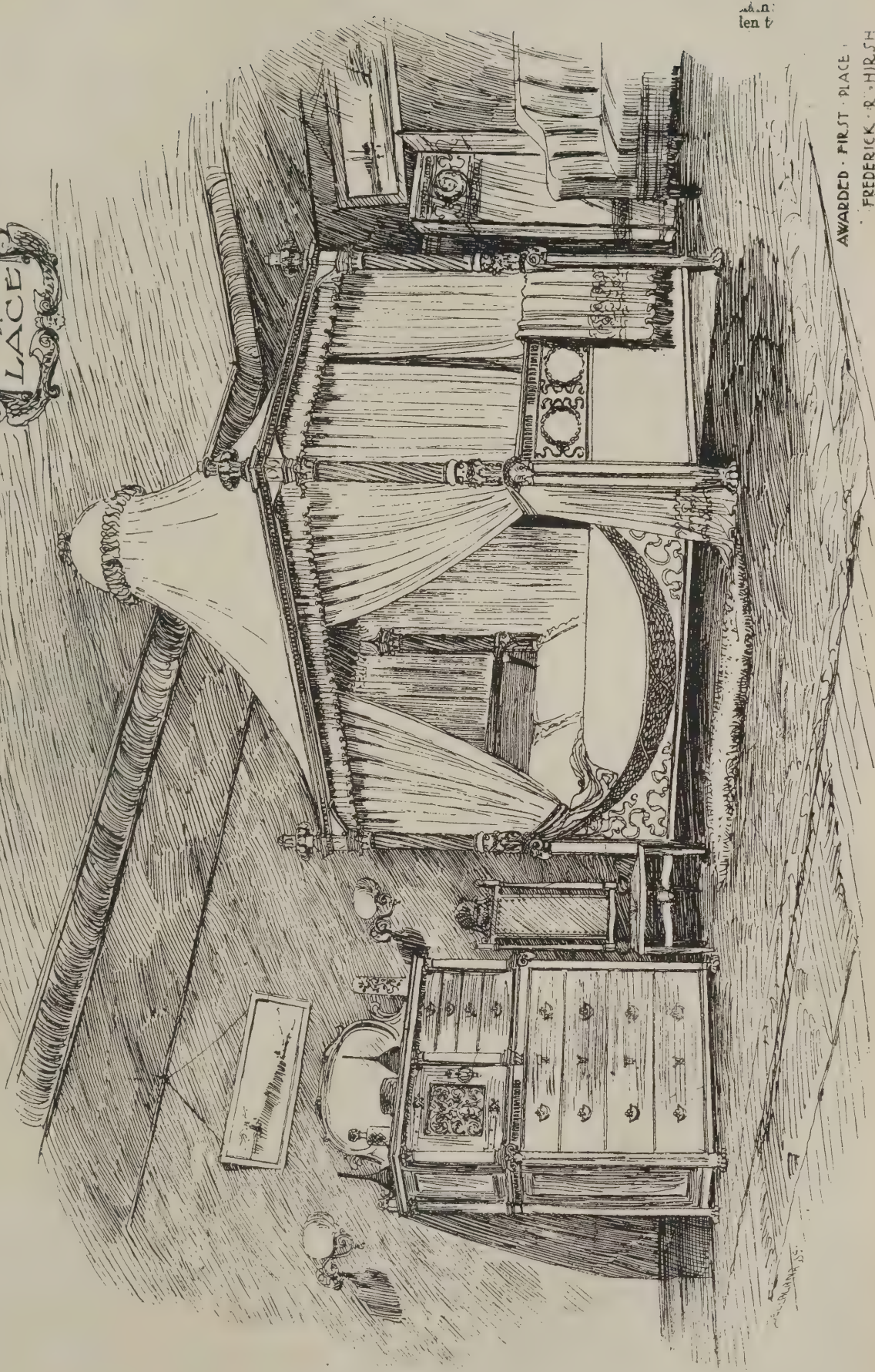


BATH ROOM CHIMNEY PIECE



DRESSING CHEST IN BED ROOMS

1892
SKETCH-CLUB OF NEW-YORK.
BY LACE
COMPETITION



and
lent

AWARDED FIRST PLACE
FREDERICK R. HIRSH

WAYSIDE NOTES.

SOMETHING has happened at the Tower Bridge. On Wednesday morning I noticed flags gaily flying, and other evidences of a red-letter day. Being by the appearance of the bridge, the smiths and engineers have completed their share of the work. Possibly the last rivet has been clinched, or the final bolt screwed home, and the artificers on the job have emulated the country bricklayer, who displays his red handkerchief when he has laid the last brick. From a distance the ironwork of the bridge certainly looks complete, and as at present existing, exhibits a natural engineering design. I find that even the public can appreciate the folly of the sham Mediæval towers, and understand that with a little modification the natural iron skeleton could have been made sufficiently architectural *per se*. However, the masons progress with the towers, and soon one of the most notable examples of lack of principle in 19th-century design will be complete. It will surely be the climax.

I see that Chertsey Bridge is now considered to be in such an unsafe condition that it has been closed against all vehicular traffic, arrangements being made for improvising a ferry for foot passengers in case the bridge should be wholly closed. The inhabitants of the district are agitating for an iron bridge to supersede the present one, which is of stone.

The subject of bridge-building occupied the major part of the attention of the London County Council at their first meeting after the recess. Vauxhall Bridge has long been insufficient for the demands it has to meet, and the Bridges Committee of the Council recommend its reconstruction. In place of the nine arches of cast iron now existing, and the great waste of water area by the numerous stone piers, the plan of reconstruction embraces a five-span bridge of steel, with granite-faced piers and abutments. The present bridge is only 36ft. 6in. between the parapets, while that proposed will be 80ft. The traffic over Vauxhall Bridge has greatly increased during the past year or two, and the widening should benefit those who habitually use the bridge. Of course, the Council cannot pretend to make any sort of Metropolitan improvement without endeavouring to institute some method of paying for the works not in accordance with the views of fairness of ordinary persons. "Betterment," indeed, seems to be to the London County Council what King Charles's head was to Mr. Dick's Memorial. It will crop up sooner or later. In the present instance, it is true, the betterment is of a peculiar kind, and partakes rather of the nature of an attempted imposition on the ground landlords of London. Some day, I suppose, we may get a County Council that will confine itself to municipal works, and leave political questions to Parliament.

I trust that we are not going to have further strikes in the building trade this winter. The manifesto of the Navvies, Bricklayers, and General Labourers' Union points towards a repetition of the difficulties of last winter. It has been pointed out as within the bounds of probability that we may have a winter which will go hard with those out of employment. Trade generally is bad, and may be worse, and the occasion does not seem fit for working men to hazard losing employment. If differences can be amicably settled between employers and men, it will be exceptionally a matter for congratulation. An extended strike in the near future must be disastrous to all concerned, contractors and their employes alike.

Aroused, doubtless, by the proposed removal of the Inman Line to Southampton, and the efforts of the seaport towns to establish a Transatlantic service, the Mersey Docks Board contemplate building a new landing stage at the extreme north of the River Mersey, which will be available at all states of the tide for the debarkation of American passengers. The proposed landing-stage will do away with the trouble of transferring passengers and their luggage across the town to the North-Western line, as the railway company, by constructing a small line, may connect the stage with the whole of their system. The matter has been referred to the great shipping companies for their consideration, and if it is favourably received. Application, says the

Liverpool Daily Post, will be made to Parliament for the necessary powers. The necessity for being abreast of the times has induced the Mersey Docks Board to make further improvements. The board are now engaged in rendering the Huskisson Dock available for large liners, and a third branch of the dock is approaching completion, having an entrance from the Sandon Basin, where the Mersey is 70ft. deep at low water, and where there is no natural obstruction to the ingress and egress of ships of the greatest burden.

A further meeting has been held at Bristol with reference to the proposal alluded to last week. The Bristol Docks Board had a four hours' sitting on Monday to further consider the scheme. The docks engineer, Mr. M'Currah, reported on the proposed new lock and dock, and proposed that the lock should be made 10ft. deeper than originally proposed, and that, to provide for the continual extension in the length of large vessels, the length of the lock should be increased to 800ft. The board have approved the engineer's additional report. It is evident that business is intended at Bristol.

It is fortunate that accidents of a kind like that which recently happened on the Furness Railway are not of common occurrence. The sudden disappearance of a locomotive into the bowels of the earth is not an incident calculated to inspire railway travellers with confidence, albeit that there is a spice of the humorous plainly discernible. And to say the least, it is waste of a good engine. The cavity into which the locomotive fell must have been very extensive. When 300 waggons of ballast had been cast into the hole, little progress had been made towards filling the gaping void. Early in the week, however, it was reported that the chasm had been filled in and the lines relaid, and that there was no vibration when heavy goods and mineral trains were run over the place. Nevertheless passengers wisely continued to walk over the spot—a distance of sixty yards—from one train to another, and will continue to do so until an inspection has been made by the Board of Trade. A shaft is being sunk to test the nature of the foundations of the embankment, and it is to be hoped that this will throw some light on a very singular affair.

The leaning Tower at Saragossa, though not having the popular reputation that the Pisa example enjoys, has yet been a wonder for centuries. The Torre Nueva has stood in the Plaza San Felipe some three hundred and eighty eight years, and formed one of the "lions" of the town. It is reported that the tower is to be destroyed, and that the work is even now commenced. In the year 1860 extensive works were undertaken with a view of arresting any further departure from the perpendicular, it being thought that the maximum of safe inclination had been reached. Lately, in spite of optimistic beliefs, the inclination has been observed to have increased, and with a view of safety the destruction of the building has been ordered. As in the case of the tower at Pisa, it has been conclusively established that the inclination of the Torre Nueva, at Saragossa, has arisen simply from faulty foundations. The building has served as a clock-tower, and is 70ft. high.

Mr. Loftus Brock's letter will have been perused with much interest by those who heard of the discoveries at East Langdon church. The church at Whitwell must be well worth a visit. I am not surprised to hear of interesting things architectural in East Kent. The district is not commonly visited by architects, yet between Dover and Canterbury there are many places and buildings worth seeing, and this district is, moreover, remarkable as the true home of the cut-brick "Kentish" gable.

Here is a step in the right direction. The Urban Sanitary Authority at Stockton-on-Tees, in advertising for tenders for a large new fever hospital, specified that the plumbers' and sanitary work and the heating of the premises should be let as separate contracts. This is as it should be—bringing the plumbers directly into contact with the principal employers, instead of giving them all the risk and worry of being sub-contractors. I see also that the corporation of Stockton, in

order to assist in securing good workmanship, have made it a stipulation that all the workmen employed on their works shall be paid the full rate of wages. GOTH.

CHIPS.

A new carved organ gallery has just been placed in Christ Church, Bristol. The front is divided by pilasters into a series of seven panels, appropriate subjects being depicted in five, and the end panels being filled with representations of musical instruments. In the base are cherubim, and the cornice is arcaded. Mr. George Haughton, of Bristol, is the sculptor.

The baptistry of Addiscombe Church has received an addition to its stained glass of two windows from the studio of Mr. Taylor, of Berners-street, with the subjects of SS. Mark and Luke.

New banking premises are about to be erected at New Barnet for the London and South-Western Bank. Messrs. Truefitt, of Bloomsbury-square, are the architects, and the contract has been taken at £3,800 by Mr. T. Butcher.

At the last meeting of the City of London Union a report was received from a committee as to the charges made by Mr. Barnett, surveyor for valuations for the assessment of public companies. It appeared that the total amount was £3,268 2s. 6d., and the charges were in accordance with the agreement made between the guardians and Mr. Barnett. Of this £1,800 had been paid on account, and the committee recommended that a cheque for £1,468 2s. 6d. should be drawn for payment of the balance. Some discussion took place, in which Mr. Day said Mr. Barnett was the strongest man the board could have obtained to fight on their behalf; and although the total sum was a large one, it was an excellent investment, for the increase in the companies' assessments was £133,640. The report was adopted.

The first annual excursion of the Cardiff and District Timber and Building Material Trades' representatives took place on Monday week, the place selected for the outing being Speech House, Forest of Dean. Mr. Owen Davies was the president.

New banking premises have just been built at Dulwich for the London and South-Western Bank. The upper floors are furnished as residential chambers for the manager. Mr. Charles Barry, F.S.A., is the architect, and the builders were Messrs. Smith and Son, Station Works, South Norwood. The new bank was opened on Monday.

The memorial stone of the new church of St. Paul, Walsall, was laid on the 19th inst. The church will replace one built in 1826, and will cost £9,000. It will be built of Codsall stone, and will seat 900 persons. Mr. J. L. Pearson, R.A., is the architect.

A temporary iron Roman Catholic church, seating 500 persons, was dedicated to St. Charles at Aigburth-road, St. Michael's Hamlet, Liverpool, on Sunday. The builders were Messrs. Humphrey, of Knightsbridge.

The Public Health Committee of Aberdeen Town Council have resolved to proceed with the carrying out of extensions at the City Hospital at a cost of about £12,700.

The death is announced of Albert Wolff, a sculptor much esteemed in Germany, who has died in Berlin in his 79th year. A pupil of Rauch, he is the author of numerous groups, monuments, and statues, both ideal and iconic, in Berlin, Hanover, Posen, Königsberg, and other German cities. In Berlin the work by which he is best known is the colossal bronze showing a naked rider attacked by a lion, which flanks one side of the great flight of steps leading to the Museum.

Mr. Alfred East's oil painting "Hayle from Lelant," hung at this year's Academy, has been purchased for the Birmingham permanent collection, and has just been hung in the Round Gallery in that city.

The collection of British, Roman, and Saxon remains excavated in Dorsetshire, and lately belonging to Mr. Durden, of Blandford, has been acquired for the British Museum, and will probably be on view about a month hence. Meanwhile a few specimens of cinerary urns, forming part of the collection, are to be seen in the Prehistoric Gallery. The most recent addition to the Ethnographical Gallery is the collection formed by Mr. Theodore Bent in Mashona-land, and presented by him to the Museum.

A memoir of the late Professor of Modern History at Oxford, Mr. E. A. Freeman, is about to be undertaken. Friends who may be willing to supply letters, reminiscences, or other biographical material are invited to forward them as early as possible to the Rev. Prebendary Stephens (Woolbeding Rectory, Midhurst, Sussex), who, at the request of Mr. Freeman's family, has undertaken to edit the work.

PUBLIC BATHS AND WASH-HOUSES.

—III.

By R. OWEN ALLSOP, Architect.

Author of "The Turkish Bath," and "The Hydropathic Establishment and its Baths."

IN the first article of this series the extent of the bathing accommodation required by the Act was stated as under:—

1. Vapour-baths.
2. Warm slipper-baths.
3. Cold slipper-baths.
4. Swimming-baths.
5. Cold shower-baths.

To this should be added (6) warm shower-baths. These are the baths for which arrangements must be made.

Vapour-baths have, in the past, been supplied by the old-fashioned vapour-box; but it is only here and there that we find even this simple sutory expedient provided. In many establishments the vapour-bath is entirely ignored. Yet in the schedule attached to the amendment of the Act dated July 2, 1847, vapour-baths are specifically mentioned, and the charge fixed at a similar rate to that for warm baths.

It will thus be seen that, in the majority of instances, the public baths of this country afford no means of sudation to the bathers who frequent them. In most of the public baths of Germany we find complete hot-air and vapour baths provided. Pending the general introduction of the Turkish bath in the public bath-houses of this country, it should be the least endeavour of baths commissioners to provide the ordinary vapour-box in as complete a manner as possible. It should be placed in a room or chamber fitted with warm and cold sprays, so that after the sweating process the bather may have the necessary cleansing and toning warm and cold effusions.

Every department should possess a vapour-box in default of any more complete sutory appliances. Both first and second-class bathers should have a bath of this kind available for their use. The Act expressly allows this, and consequently it is the duty of commissioners to see that such baths are provided. No great amount of space is required; an area equal to less than two of the private bath inclosures would suffice. The room should be lined throughout with glazed ware, and have a drained, tiled floor; the vapour-box, properly connected with the steam supply, would stand in one corner, and on another side of the room would be appliances for giving warm and cold sprays. Two dressing-places should be connected with the room, which, in effect, would be a kind of douche-room. Nothing in such an arrangement would be overstepping the bounds of the Act of Parliament, but the carrying out of the idea would only be properly construing its stipulations, which, as it is, are so frequently ignored.

Altogether the arrangements for any baths, except swimming and slipper baths, hitherto made in our public bathing establishments are of a very rough-and-ready and "hugger-mugger" description. Fine swimming-baths are provided, and the slipper bath arrangements are usually complete; but should the bather have a mind for a vapour bath or a hot or cold shower, the only preparations made—and that only in a few out of the many bath-houses—are of the most meagre description. There is the shower, truly, but it is only a rose inconveniently fixed above a slipper bath; and here, perhaps, is the vapour-box, but so cramped up in the narrow space of an ordinary slipper bath-room that it cannot be effectively worked.

All points to the need for a proper douche-room in the public bath-house—a chamber where the vapour-box may be placed and good shower-baths fixed.* It is impossible to study the Baths and Washhouses Act and its amendments without feeling that the present accommodation afforded in the average establishment is not in the true spirit of the Act. Swimming-baths are made much of by commissioners; but as a matter of fact it was not until an amendment of a date as late as 1878 that provision was made for swimming-baths; while less than a year after the passing of the original act, warm and cold shower-baths and vapour-baths were added to the original schedule of prices of ordinary warm and cold baths.

It may be that it has been found that vapour-baths are not in any great demand in public bath-houses. To this I would reply, that if sutory baths were more complete and attrac-

tive they would surely become more popular. It is something of a duty on the part of the State to educate the poor in this matter. It is quite comprehensible that the vapour-bath is not so popular as the hot-air bath. The former is far inferior as a bathing appliance, and the latter is infinitely more pleasant. Every experience of the past has shown that the hot-air bath provided cheaply for the people rapidly becomes popular; but the hot-air bath is not permitted by the Act, and therefore, though a poor substitute, I plead for the only sudorific expedient included therein—viz., the vapour-bath.

SLIPPER-BATHS

are the great mainstay of public bath-houses, after the swimming-baths. Indeed, during the winter they are their chief concern, the cold weather deterring the majority of swimmers. It being a popular idea that to bath properly one must soak like a potato in a complete immersion of hot water, the slipper-bath maintains its hold on the people in spite of the fact that a hot-air chamber and a pint or two of water, with soap to match, affords a more effective method of cleansing the body. The slipper-bath and its dressing chamber, apparently, is an institution that has long reached perfection; for the baths of the first days of the Baths and Washhouses Act are practically the baths of the institutions of to-day. The chief difference to be noticed in modern bath-houses is the substitution of heavy porcelain baths for the earlier and objectionable zinc troughs. The generally approved method of placing slipper-baths on the plan is in two rows on either side of a hall and with a central gangway, off which open the doors. (See plan given in Article II. published Aug. 26.) The partitions are ordinarily made of enamelled slate, the doors generally of the same material, and neither carried up higher than about 6ft. or 7ft. Economy of space is usually all-important, or half-brick, glazed-both-face walls, in cement, would make more pleasant-looking divisions than the monotonous slate. Wood is bad, the vapour and water soon destroying such partitions. For this reason the slate doors answer well although heavy, and hence liable to chip if "banged."

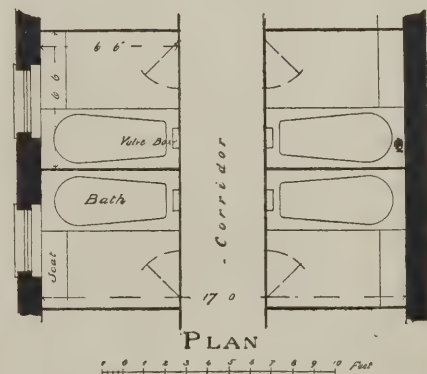
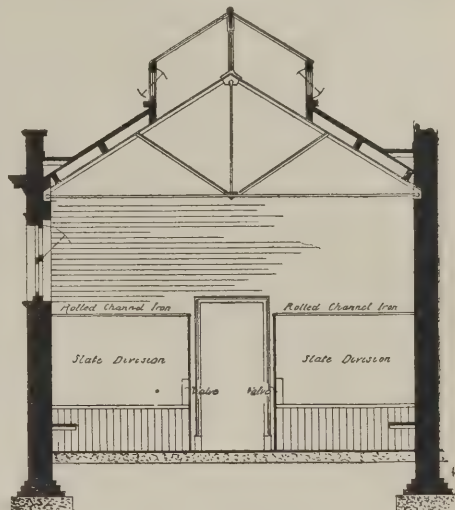
A cheerful waiting-room at the entering end of slipper-baths should always be provided, and proper conveniences connected therewith.

The dimensions and arrangements of the slipper baths, their dressing places, and even of the halls wherein they are placed, have become crystallised. There is a gangway, or corridor, varying in width from 3ft. to 4ft., and each bath-room measures 6ft. 6in. by 6ft. 6in., or thereabouts, the divisions being 6ft. 6in. high, and the doors the same height and 2ft. 3in. wide. The slate partitions are best held in light channel iron, screwed, bolted and bent, or forged, as may be necessary to form the requisite connections. The baths, of porcelain, should be placed, where possible, in pairs, with the partition between, so that plumbing may be concentrated. A wooden top is generally provided. Nothing beats white deal as ordinarily employed, unless it be teak, as fixed at St. George's Baths, Buckingham Palace-road. A permanent wooden seat to match should be provided. A matter of the greatest importance in connection with slipper-bath arrangements is the valves and wastes. It is evidently desirable that these should be as effective as possible—viz., that the bath should be quickly filled and quickly emptied, otherwise the attendant's time is wasted. I understand that a good valve of this class is still a desideratum, but these matters will be dealt with in their proper place.

As regards the universal adoption of porcelain baths they do not satisfy all superintendents. I have been told that the cold porcelain cooling the hot water when turned in, the bathers complain that they do not have their baths hot enough. Much the same drawback was once pointed out to me at an inland spa, where at the public bathing establishment a bathman complained that the cold, thick porcelain cooled the water, and felt cold to the bather, as a remedy for which defect he suggested a coil of hot-water pipes round the bath under the wooden top. There is a good deal in the objection to porcelain. The discomfort of being in warm water in a cold

marble bath is well known. Wood, as a top for baths, has also been criticised, the wet wood being objectionable to fresh bathers. For the two evils the remedies are curiously reverse. More business will keep the porcelain bath warm, and less to do will give the wooden top a chance of drying.

Elsewhere I have said "one other point in public baths I would mark for improvement, and that is the introduction of a cold shower bath over every warm bath—over the cheapest bath—and at no increased charge. At present we find in the slipper bath department of public baths, that one or two of the bath-rooms are fitted with the old-fashioned shower bath. Now . . . after a hot bath—unless the bather can step from the bath to his bed—the relaxed condition of the skin and perspiratory glands absolutely demand the tonic application of cold water in order that the cuticle may be strengthened and hardened



against cold. Every warm bath, therefore, should have its cold shower. The arrangement need not be anything but the simplest, and a system of waste-prevention would do away with the reckless use of water. The warm bath at present afforded by the Act in public bath-houses is a half-measure. The whole would be complete if a cold shower were appended."

This is an important point. Numberless colds must have been given and daily gained through persons going from a hot bath reeking in perspiration to the chilly air of the streets. Cases have come under my personal observation. I would, then, have this cold shower introduced over every warm slipper bath, in addition to the showers in a douche-room such as has been advocated above.

The hall or apartment in which slipper baths are placed necessarily requires abundant ventilation, there being much vapour arising from the use of the baths. A section of roof such as that shown in the accompanying illustration is to be recommended.

OBITUARY.

WE regret to announce the death of Mr. William Sugden, principal of the firm of Sugden and Son, architects, Leek. Mr. Sugden was born on June 16th, 1821, and was, there

* For plans and description of douche-rooms, see "The Hydropathic Establishment and its Baths."

* I find that there is a decided consensus of opinion among bath superintendents in favour of slate. It has been suggested to me, however, that if 3in. clear were left between slate doors and frames, there would not be a tendency to chip at the edges. Some doors fit too closely.

fore, in his 72nd year. He was a pupil of the late Samuel Frier, of Framlingham, Suffolk, and afterwards of the late Christopher Davy, of Furnival's Inn, E.C. He enjoyed an extensive practice in Leek and throughout North Staffordshire, his works in the town in which he practised including the Congregational, Wesleyan, and Roman Catholic chapels and schools, the cemetery buildings, savings-bank, mechanics' institute, and museum. He had carried out some church restorations, and many chapels and schools and mansions, in Staffordshire, Lancashire, and Yorkshire. He died on Saturday, and was buried at Leek on Tuesday last.

Mr. Matt Wyatt, eldest son of the late Thomas Henry Wyatt, P.R.I.B.A., of Great Russell-street, Bloomsbury, died on Monday at Weston Patrick, Hants. Mr. Wyatt was trained in his father's office, and for many years carried on the practice with his father, and since his death, but retired from the profession some years since. He was 52 years of age.

The death is announced from New York of Mr. Henry Hudson Holly, architect, of that city, who seems never to have recovered entirely from the effects of the accident which happened to him three years ago. Mr. Holly was, says a Transatlantic contemporary, an old New Yorker, of very good family, cultivated, agreeable, and devoted to his profession. It was his fancy, however, to carry on a rather quiet practice. His clever and useful books on "Country Seats" and "Church Architecture," which were very popular, brought him a great deal of work to be done by correspondence; but he superintended his more important buildings. He was one of the first members of the American Institute of Architects, and always ready to serve on committees, or to be of use to the profession in any way, and his courtesy and tact made him always valuable. Among his principal buildings are the Virginia Military Institute, and a house in Colorado, which is said to have cost 400,000dols.

M. Joly, the distinguished Parisian architect, who designed the Chamber of Deputies and many other important buildings in that city, died on Wednesday at the age of 68.

Mr. Josiah Dimmock, who was for many years the head of the large firm of J. and T. Dimmock and Co., English and foreign timber merchants, Stoke-on-Trent and Stone, died on Friday evening at his residence at Fradswell Hall, near Stafford, where he resided for a quarter of a century. Mr. Dimmock had been a member of the Stoke Board of Guardians from 1847 down to last year, and was chairman of the board during the last twenty-four years of his connection with it. In 1869 he was placed on the commission of the peace for the county, and thenceforward took a great interest in the business of quarter sessions. He particularly identified himself with the management of Werrington Industrial School, and was for many years, up to the time of his decease, chairman of the managing committee of that institution. On the formation of the Staffordshire County Council he contested one of the divisions of Stoke against Mr. J. F. Campbell, the head of Minton's (Limited), but was beaten. He was, however, soon afterwards elected an alderman of the council, and held that office until his death.

Mr. Thomas Gilchrist, J.P., Dean of Guild of Coatbridge, and the first senior magistrate of the burgh, died after a prolonged illness on Sunday. The deceased, who was a native of Lanark, was one of the leading builders in the district, and his practical knowledge rendered him a valuable acquisition to the town council and school board, of both of which he was a prominent member.

At a meeting on Tuesday of the Gloucester City Council it was reported that the Midland Railway Company's engineer was engaged on plans for a new station.

The Mayor of Lincoln will preside over a public meeting to be held in the town hall, Lincoln, to-day (Friday), to open the plumbing classes held in connection with the Lincoln School of Science and Art. The meeting will be under the auspices of the Lincolnshire District Council for the National Registration of Plumbers. Addresses will be delivered by the Lord Bishop of Lincoln, the Reverend the Sub-Dean, Dr. Mansel Symonds, W. Watkins, F.R.I.B.A., ex-mayor of Lincoln, and others, on the importance of the proper training of plumbers, and the promotion of improved sanitation in the interests of the public generally.

Building Intelligence.

BATH.—At Tuesday's meeting of the city council a report was presented recommending the acceptance of the tender of Messrs. Hayward and Wooster, of Bath, for £22,253—the lowest of twelve, the next being that of Messrs. J. Long and Long, also of Bath, which was only £20 more. The report also reiterated the opinion the committee had already expressed as to the advisability of further altering the plans in the direction of setting the new south wing further back. This matter has been the subject of considerable agitation in the city, and already a memorial against any encroachment on the highway had been presented. A large number of citizens now came up with another memorial that set forth that to build as projected will cause congestion of traffic by narrowing the roadway, and restrict the view of the Abbey Church. The report traversed these arguments, and said that to alter the plans would necessitate entirely new places both for the interior and exterior of the buildings, or else seriously diminish the accommodation. The spokesmen of the deputation were Mr. Titley and Mr. C. B. Oliver, the latter one of the architects who competed; and Ald. Murch, on behalf of the committee, upheld its views, and protested against the question being reopened at this stage, when no new circumstances had transpired, when the property has been purchased and tenders accepted. In the course of the discussion, numerous questions were asked of the architect, Mr. Brydon, who was present, and the tendency of his replies was that to alter the site as suggested would increase the difficulties of providing the accommodation required. By a majority of three, 24 to 21, the report was sent back to the committee, with the object of amending the plans.

CARMARTHEN.—A new school of art is in course of erection facing St. Peter's Church, Church-lane, at a cost of £1,500. It is Modern Renaissance in character, and is built of red Bridgwater bricks, the mouldings and cornices being of Ruabon bricks, and the dressings of Bath stone. Accommodation is provided for 70 pupils. Entering through a hall, laid with tessellated tiles and divided by an arcade supported by fluted and moulded pilasters, one finds on the ground floor an elementary-room 37ft. by 20ft., and a modelling-room 18ft. 6in. by 19ft. The rooms are 16ft. high. The upper floor contains a room 37ft. by 20ft., and a master's room 18ft. by 12ft. The former will be divided by a curtain or movable partition, and the divisions will be used as painting and antique room respectively. On the upper floor there are also lavatories and a ladies' cloak-room. The work has been carried out by contract by Mr. T. Morris, Carmarthen, from the designs and under the superintendence of Messrs. G. Morgan and Son, architects, of that town.

DUBLIN.—The old front of the City of Dublin Hospital in Bagot-street has been removed for the purpose of reconstructing and enlarging the premises. The plain red brick edifice will give place to a building of a more modern character. The alterations when completed will result in more accommodation being provided for the patients; the institution will have more beds at disposal, and additional room will be afforded for the nursing staff. New quarters are being erected for the resident pupils, and the house-surgeon will have a room to himself. The work of improving the building has been rendered possible by the gift of £6,000 from Earl Pembroke, who also recently presented a large sum of money for the establishment of technical schools at Ringsend. The architect is Mr. E. Murray, and the contract is being carried out by Mr. Samuel Worthington, also of Dublin.

EDINBURGH.—The Grange Cricket Club are about to erect a new pavilion on their ground at Raeburn-place, at a cost of nearly £3,000, which promises to be one of the most ambitious affairs of its kind in Scotland. Designed in the Domestic English style—the lower story being constructed of stone and the upper portion of brickwork, faced with cement and open timber work—the main building will occupy a site immediately behind the existing structure, and will measure 58ft. 6in. by 48ft., irrespective of a sloping grand stand, which will project about 40ft. forward, and seat about 250 persons. On the ground floor will be a dressing-room measuring 40ft. by 20ft., a professionals' dress-

ing-room, a bedroom, parlour, and kitchen for the caretaker, and lavatory accommodation. Under the grand stand, nets, rollers, and other appliances for the game will be housed. Entrance to the upper or main floor can be had either by an inside stair, or by the inclined gangway which runs up the centre of the grand stand. The pavilion hall, which has an open timber roof, will measure 56ft. by 27ft. 6in. On one side will be a committee-room, and on the other a dressing-room. On the roof there will be sitting accommodation for 200 people, the access to this being obtained from a square tower, the pinnacle of which will be 60ft. high. The roof of the tower and of the main building, so far as not set apart for sitting accommodation, will be treated in red tiles. The architects are Messrs. Cunningham, Blyth, and Westland, George-street, Edinburgh.

HEREFORD.—For some two months past a staff of workmen have been engaged in the extensive work of re-fitting, re-painting, and renovating the premises of the National Provincial Bank of England, Broad-street. The heavy counter has been removed, and also the old-fashioned boxes in the centre of the large hall, giving freedom of ventilation and increased comfort, the old furniture being replaced throughout with French-polished mahogany fittings. Along the front of the counter a new wrought-iron "grill" of novel design has been placed with massive gas standards of brass at intervals. New lavatory arrangements have been carried out in the basement, the lavatories being lined with white glazed bricks. The whole of the work has been carried out under the direction of the architect, Mr. Charles R. Gribble, of London, and Mr. Grimes, the clerk of the works. Messrs. W. P. Lewis and Co., Commercial-road, Hereford, carried out the contract.

NEWPORT, MON.—The new church of St. Matthew, Church-road, Barnardstown, was opened on Monday. The building has been erected by Mr. Charles Lock from designs prepared by Messrs. Graham, Son, and Hitchcock, and is in a plain Gothic style. It is built of random rock-faced Pennant stone-walling, and Bath-stone dressings. The roof is of open timber and match-board, covered with slates. The building will seat 512 persons easily, but in an emergency 600 can be accommodated. The internal walls are stuccoed, and the woodwork is stained and varnished. The whole of the interior is one open space, so that an uninterrupted view of the clergy can be given to the congregation. There is a transept on either side, and a choir vestry and organ chamber. Provision has also been made for heating the building. The cost has been £3,300.

READING.—On the invitation of Mr. Slingsby Stallwood, architect (chairman of the Survey Committee), members of the corporation and others, on Thursday in last week, inspected the works of reconstruction at the Hospitium in St. Lawrence's churchyard (which has been adapted for the use of the Extension College and School of Science), and the Corn Exchange, which has also lately been completely renovated. Assembled in the lecture hall, Mr. Stallwood sketched the history of the buildings, which originally formed part of a dormitory attached to St. John's Hospital, erected by Abbot Hugh in 1192. They consist of a fine lecture-hall and a class-room, two sets of lavatories and cloak-rooms, on the lower floor, with communication from the churchyard and from Valpy-street; on the next floor a good room used as a council room by the college authorities; and on the top floor a laboratory with bench accommodation for 32 students, a room for the science master, a balance room, and a small theatre. The work has been carried out under the direction of the borough surveyor (Mr. A. E. Collins), with Mr. George as clerk of the works; Mr. Stallwood supervising the preservation and restoration of all the ancient features.

A steam saw mill at Warminster, belonging to Mr. Mark Hill, was destroyed by fire on Friday. The damage is estimated at over £2,000.

After being closed for six months pending alterations, the parish church of Blackford, N.B., was reopened on Sunday last. A chancel 20ft. deep has been added, completing the cruciform design of the church. At the same time the heating and lighting apparatus have been renewed and enlarged, the old windows changed for others of tinted glass in lead frames, and the interior repainted.

Engineering Notes.

BRISTOL.—The Bristol Docks board had a four hours' sitting on Monday, to further consider their scheme for dock extension at Avonmouth, which is to cost over a million of money, the scheme being put forward to attract Atlantic liners to the port. The Docks engineer, Mr. M'Curich, reported on the proposed new lock and dock, pointing out that as he found from borings taken at Avonmouth, that the rock would allow of the proposed locks being made ten feet deeper than originally proposed, he suggested that this extra depth be obtained. He also proposed that the lock should be increased to a length of eight hundred feet, and that additional land be taken in order to make the dock of sufficient extent to allow for the accommodation of a larger class of vessels. The estimated cost of this work, including the deepening of the channel, was about £50,000. The Board approved the engineer's additional report, and the Town Council have also adopted it.

MARTON AND LEAMINGTON RAILWAY.—The new line from Daventry to Leamington, in connection with the main line of the London and North Western Railway from London to Birmingham, was commenced by a large staff of men and a plentitude of material at Daventry on Tuesday, the 13th inst., and when completed, it will lessen the distance between London and Leamington by 8½ miles. The distance to be traversed will be a total of 26 miles, being 11 miles from Daventry to Marton, and 15 miles from Daventry to Leamington, and it is anticipated that the line will be completed in two years.

ARCHÆOLOGICAL.

WENHASTON.—During the restoration of the parish church of Wenhaston, East Suffolk, a work just commenced by Messrs. Ludkin and Son, of Banham, under the direction of Mr. E. F. Bisshopp, F.R.I.B.A., of Ipswich, a painting on oak boards of "The Last Judgment" has been found covered with whitewash and plaster. It appears to have formed the upper part of the chancel screen, and is nearly perfect. The picture, which measures 16ft. by 8ft. 6in., was subdivided into panels by a wooden cross fastened on with bolts, of which only the holes now remain, and the two bottom side-panels were apparently formed by the carved images of patron saints which have also disappeared. The top panel represents our Lord coming to Judgment on clouds supported by a rainbow, the companion panel being devoted to the Virgin and Joseph, both being in a kneeling posture. Beneath our Lord is a group consisting of a figure of St. Peter in pontifical robes and four nude figures wearing crown, mitre, cardinal's hat, and coronet. The companion panel shows St. Michael with sword, and a winged devil with horns, hoof, and tail, between them a scales with a nude human figure in the left balance outweighing two imps in the right scale. To the right is a panel portraying an open-mouthed dragon's head, containing nine nude human figures inclosed by two demons with a red-hot chain, one of the demons holding in his hand a rake.

CHIPS.

Mr. Charles Mitchell, of Elswick Works, has offered to contribute from £10,000 to £12,000 towards the extension of Aberdeen University, on condition that science classes for artisans are established in the evenings; that professors of engineering and agriculture are appointed; and that a large central hall is included in the plan for the enlargement of the present buildings.

On Saturday was opened the Beveridge Park, at Kirkcaldy. The park extends to 110 acres, and formerly formed part of the estate of Raith. It lies at the west end of the burgh, and commands a splendid view of the Firth of Forth and surrounding country. The band-stand was erected by Messrs. M'Donald and Stevens, Glasgow.

The first annual scholarship of the Royal Drawing Society has been awarded to Miss F. M. Price, of the Southsea High School.

The presidency of the Junior Engineering Society for the ensuing session has been accepted by Dr. John Hopkinson, in succession to Sir E. J. Reed. The new session will be opened by the delivery of Dr. Hopkinson's presidential address on Friday, Nov. 4, at the Westminster Palace Hotel.

COMPETITIONS.

CLERKENWELL POLYTECHNIC.—Mr. Charles Barry, F.S.A., has been appointed assessor in this competition. The building is to cost £100,000, and several architects have been invited to compete.

SALFORD.—The Salford School Board have chosen Messrs. Woodhouse and Willoughby, architects and surveyors, of Manchester and Stockport, to design the St. Margaret's School for 500 scholars. The estimated cost is £4,651. At the same meeting of the board, held on Monday, Mr. Henry Lord, of Manchester, was appointed architect of the schools at Ordsel, which will accommodate 340 children at an anticipated outlay of £3,120. The names of eight firms were chosen by the board from which to make their selection.

LLANELLY.—This town hall competition has been settled in favour of Mr. W. Griffiths, F.S.I., of Llanelly, who was placed second by the referee, Mr. Charles Barry. The first premium was awarded to Messrs. Frank W. Simon and Tweedie, of Edinburgh and Manchester. These gentlemen warmly complain very naturally that the assessor's award should have been thus ignored by not appointing them architects for the work, and the merits of the designs no doubt justify their complaint, besides which, having obtained plans on the assurance that a competent assessor would be appointed to select the designs, the promoters were morally bound to consider the condition binding on all parties. Mr. Griffiths offered, we understand, to undertake the work at four per cent.; while the other architects seemed to have asked the usual five per cent. commission. This is a free country, and if people like to work for nothing, there is no law to prevent it. No doubt some men would undertake work for half the price usually paid; how it would be done is another matter. Open competitions always present the difficulty of distance. Travelling to and from Llanelly to Edinburgh constantly must be an expensive affair, and time consumed in travelling soon runs into money. A man on the spot always, therefore, competes with advantages in this respect—particularly in Wales.

VICTORIA CATHEDRAL, B.C.—The competition held in London last May, when we described and illustrated the best designs submitted, has now been settled, and Messrs. Keith and Evers, of Victoria, are the elected architects for the work. Their plan was a fairly good one, and had a central western tower and spire, the church being conceived in an Early English style; but the design was commonplace, and hardly competed seriously with the two other premiated designs, "Ars" and "New and Old"; though, no doubt, the latter was quite unsuitable for execution in Vancouver and on such a site. Sir Arthur Blomfield, A.R.A., was the referee, but as his report cannot be obtained, we can only quote the words of the Hon. Sec., who writes us that "Fides" "appears to have been considered the most appropriate by Sir Arthur Blomfield." As far as we were able to form an opinion on the merits of the designs, there seemed no question that "Ars" was out and away the most appropriate design, and the recommendation of the referee as above communicated seems inexplicable, so that we can hardly think our informant can have been correctly advised by the Bishop of British Columbia. Messrs. Keith and Evers "have been called upon to show by tenders that the work can be done for the money." This probably will tax their ingenuity, as the elevations were busy with big rose windows full of tracery, and this kind of work in British Columbia is expensive, and difficult to get well executed. The author of "Ars" is, we believe, Mr. A. R. Scott, of Westminster, from Paisley, N.B.; and the gentleman who sent in the design marked "New and Old" is, we are told, Mr. H. Wilson, of the late Mr. Sedding's office. Both these designs are to receive premiums—one £100, and the other £50. The order in which they stand is uncertain. Messrs. Keith and Evers are to be paid the £150 prize.

Messrs. Baird, Thompson, and Co., ventilating engineers, of London and Glasgow, have been commissioned by one of the principal firms of Atlantic steamship owners, who have practically experimented and tested that firm's improved patent combined system of mechanical and automatic ventilation as applied to one of their ships, under the guarantee of no cure, no pay, to fit up all their fleet of ships with the same.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL, XLII, XLVI, XLIX, L, LI, LIII, LIV, LVIII, LIX, LX, LXI, LXII, and LXIII may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—F.R.I.B.A.—G. B. and Co.—S. Australian.—L. R. and M. F. Co.—B. J. M. (Dublin).—T. W.

Correspondence.

THEATRES.

To the Editor of the BUILDING NEWS.

SIR,—Mr. Woodrow, in his Article No. V. (BUILDING NEWS, Aug. 19), has dealt with one of the most interesting, and, as he admits, one of the least understood, requirements of theatre building. He is, however, of the opinion that by the observance of "certain fundamental rules" as to "proportion and the employment of suitable materials" a building may be produced in which it will be "easy to hear in, speak in, and sing in." Herein lies the crux of the whole question. What are the proportions and materials most favourable to the acquisition of acoustic excellence in a theatre? Mr. Woodrow's answer is somewhat of a negative one. He deprecates the use of wood, seemingly on the ground that the advocates of this material in the past had no knowledge or experience of the resonant qualities of concrete and iron as constructive materials. It does not necessarily follow that because a material is resonant it is therefore the best to use in the construction of a theatre. From my own observations, I am of opinion that acoustic perfection is a matter not easy of attainment in fire-proof theatres, where the exigencies of concerted music and oral delivery have to be equally provided for. As I pointed out in a communication to the BUILDING NEWS, March 16, 1888, such a combination of desirable conditions are not easy of attainment, in so far that certain acoustic properties favourable to musical performances are inimical to the propagation of oral sounds. Mr. Woodrow implies that there is "little difficulty" in obtaining fireproof theatres of "limited size" that shall possess all the most desirable acoustical properties; but he fails to

mention a theatre where these desirable conditions are to be found. So far as the opportunities for comparison have enabled me to form an opinion, the concrete theatre does not, acoustically, compare favourably with the older theatres wherein the predominating material is wood. The mere fact that concrete is more or less resonant, and that it may be used with advantage—as I have seen asserted—for organ floors, does not prove its superiority to wood as a reinforcing medium under all and every condition.

Mr. Woodrow does not touch upon the desirability of adopted "harmonic proportions." This, I am aware, is a very abstruse subject, but assuming that "harmonious proportions" constitute one of the conditions essential to acoustic excellence, their adoption in buildings constructed with modern fireproof materials appears to be far more a necessity than in buildings constructed with wood. Wood may be said to vibrate in sympathetic responsiveness to all notes, whereas the several fireproof building materials are each more actively responsive to particular notes and sounds. To this extent, the employment of concrete as an acoustic material is merely tentative, whilst on the other hand, the results to be obtained from the use of wood can be accurately pre-determined. It has, therefore, to be yet proved to what extent the rules and conditions conformable with acoustic perfection in a building lined with wood are applicable to buildings constructed entirely with fireproof materials. I am aware that the builders of the most recent theatres claim for them acoustic qualities equal, if not superior, to those of earlier date; but it would be interesting to have the opinion of musical and dramatic professionals—who are always quick to detect the non-existence of good acoustic properties—as to the acoustic qualities of the new theatres as compared with the old. Personally, I have experienced difficulty in hearing distinctly in even the smallest of the concrete and iron theatres, and I am not alone in experiencing a similar difficulty in one of the largest. That the problem under consideration is not one of the simplest connected with theatre building is admitted by Mr. Woodrow. Fireproof material, *per se*, does not absolutely commend itself on the score of its unquestionable acoustic qualities, for in the concluding paragraph of his article he does not hesitate to award to the upholsterer, and the clothing of the audience, "an important part" in assisting "in the perfection of the acoustic qualities of a fireproof building."

Bearing upon the question of proportion, Mr. Woodrow quotes an authority who asserts "that the proper distance for distinct hearing was nearly the same in a long, narrow room or passage, as in a large square room."

This statement does not appear to be in accord with past experience and practice, for concert-rooms and lecture-halls are invariably planned with a near approach to a double square than otherwise. Experience has confirmed the theory that contracting the width of a room has a tendency to give a consequent forward impulse to sounds emanating from either end, and also to lengthen the distance at which such impulses are audible from their original source. It is further agreed by those who have carefully considered the subject, that, with the object of securing the best acoustic results, the predominating dimension of an interior should be in the direction in which the voice is intended to travel. From this it is reasonable to infer that a square-planned room is not compatible with the economical conservation of sound.—I am, &c.,

Sept. 26.

JAMES GEO. BUCKLE.

PUTTING IT PRETTY.

Sir,—The inclosed gem in the way of architectural description, is cut from to-day's *Daily Independent*. It describes a new church at Leicavay which must be worth a pilgrimage to see. The designer has, with native modesty, suppressed his name. We read that "it is of Gothic design." A cast-iron circular staircase, which is beautifully bronzed, leads to the organ gallery, which is supported by iron columns. We also find that the chancel arch of this Gothic church is supported on marble pillars with Grecian O G mouldings. Oh! for the name of the designer of such a church. Here is the description:—"The new church, which is 97ft. long by 44ft. wide, is of Gothic design, and a cut stone belfry, 54ft. in height, rises from the

front. The interior of the church is beautifully finished. The ceiling is panelled, and the principals, which are of spruce memel, rest on cut stone corbels, and are connected and supported by iron suspension rods. A cast-iron circular staircase, which is beautifully bronzed, leads to the organ gallery, which is supported by iron columns. The moulding in the front of the gallery is of walnut wood. The walls are wainscotted with pine, while the rails of the sanctuary, which are designed in accord with the Gothic style of the building, are capped with white oak. The arch of the chancel is supported on marble pillars with Grecian O G mouldings, the roof being of diagonally framed panels, with raised walnut mouldings, while the back is wainscotted in oak."—I am, &c., A DUBLIN ARCHITECT.

Intercommunication.

QUESTIONS.

[10860.]—**Mounting Drawings.**—Will some surveyor, or other person experienced in this kind of work, kindly give some information as to the proper way of mounting drawings, maps, &c., on cloth; the kind of cloth, not too thick, and the mounting medium to be used?—A. F. F.

REPLIES.

[10833.]—**Timber and its Position.**—Sidney F. Harris states that "the reason for placing staves inversely to their natural position is because the sap-valves open upwards from the root, and when thus reversed they prevent the ascent of moisture in the wood." Will your correspondent kindly inform us in what sort of wood these valves can best be seen, and how their action can be demonstrated?—E. S.

[10842.]—**Composition for Renovating Stone-work.**—Saturating the stone with Randall's solution will harden it and enable it to further resist frost; and the same mixed with plaster could be used to fill in defective places. Such plaster would also be unaffected by frosts, and the work might even be done in frosty weather without injury.—J.

[10848.]—**Books for Student Surveyors.**—"Kappa" should first get his boy to master the ordinary rudiments of arithmetic, geometry, and mensuration. The problems on triangles and other figures of planes and solids ought to be mastered. Baker's "Mensuration," "Land Surveying and Levelling," and G. W. Uaill's "Practical Surveying," all published by Crosby Lockwood, are excellent elementary books for learning these matters. If "Kappa" can get his boy to join some surveying class, such as are given in some technical schools, it would be of service by-and-by. For valuing and auctioneers' work, the practical knowledge learned at the office may be supplemented by reading such books as Tarbuck's "Handbook of House Property," "The Law of Vendors and Purchasers of Landlord and Tenant"; but these may be taken up later. The Secretary of the Surveyors' Institution, Great George-street, Westminster, will send all particulars as to the examinations on the five divisions, a syllabus of the subjects and list of text-books and papers set, by which "Kappa" may set his boy to work on the lines therein laid down. The books recommended by the Institution would be desirable to obtain, or some them.—G. H. G.

[10849.]—**Swedish Wooden Houses.**—I am not certain that a Swedish wooden house has any distinguishing advantage over other houses constructed of wood. The houses are generally built of square logs, without the projecting carved work or gables, &c., seen in those of Switzerland. Some houses have stone basements; the upper stories have lofty and large rooms; rarely with fireplaces, but heated by glazed tile stoves. By using asbestos to fill between the floor joists, and to line the walls and partitions, a fairly uninflammable house could be built. The saving effected in such constructions would be small as to comparative cost in a place where bricks are cheap. The wooden construction would be available for vestries, meeting-rooms, &c., if proper care be taken in construction.—LIGNUS.

[10850.]—**National Competition Drawings.**—The drawings in building construction sent in to these competitions are, I think, done to an inch scale. They are generally coloured in the usual tints to express stone, wood, and iron. Perspectives are optional, I believe.—GEORGIUS.

[10851.]—**Bedding Iron and Wood on Stone.**—Notwithstanding the experiments cited by "J. H.," I should be inclined to interpose a piece of sheet-lead between the iron and stone template as tending to equalise the pressure of the girder on the stone. Layers of pine would be equally desirable. The intervention of a soft material must prevent the danger of chipping, or as masons call it "flushing," and for this purpose they generally put between the stones of a column sheets of lead. It is questionable whether any such material is necessary between a heavy wood bressummer and a stone template. It would, however, be desirable that the template should be dressed perfectly level, and the extreme edge slightly bevelled to avoid a flushing taking place at the angle. A weighted beam must compress the extreme angle or nosing of the stone more than it does the inner part of the bearing.—PRACTICAL.

[10851.]—**Bedding Iron on Stone, &c.**—In bedding flat-ended columns on stone, great accuracy is required to prevent fracturing the stone on which the column rests. In specifications for this kind of work, the architect should require that the base of iron column be faced in the lathe, and that the stone be dressed perfectly level to give an even bearing. In addition to this, under heavy loads it is desirable to place a sheet of lead or felt between the base of column and stone. Another

plan is to run in liquid cement between the two surfaces after the column has been fixed quite plumb, so that all inequalities of stone and iron be filled up. This cement solidifies, and forms a hard bed. In the case of cast-iron girders resting on stone or bearing plates, it is desirable to specify that a layer of sheet-lead or felt be introduced between the surfaces, so as to distribute the pressure. The slight thickness of the impressionable lead assists to equalise the pressure, and prevents the bottom flange of girder from pressing on the edge of stone template. Fracture and chipping of the stone are thus avoided. I think that felt is quite sufficient for the purpose, especially if the bearing surfaces are large, and the pressure not very great. All abutting surfaces of stone and iron should have either lead or felt or thin laminae of pine, and this precaution is especially desirable when the surfaces are not truly faced, or are uneven.—G. H. G.

[10854.]—**Laboratories.**—The benches or working tables should be of stone or brick built up from a concrete foundation. For electrical experiments, brick pillars about 2ft. square may be constructed for the tables, these piers being taken down to the solid ground or rock.—G. H. G.

[10857.]—**Testing Drains.**—One way of testing drains is to obtain some oil of peppermint, and placing a sufficient quantity of it in some warm water, throw it down the rain-water pipe or some outside gully, closing the same immediately afterwards. Any leakage or defect in the drains will quickly be revealed if another person uncontaminated with the odour goes carefully over the house and tries to discover the smell of the peppermint. The doors and windows of the house should be closed before the oil is thrown, so that no smell of it should enter the house and vitiate the test. Perhaps some more practical drain-tester than I am may give "Sewer Gas" more definite instructions as to the manner of testing.—T.

[10859.]—**Hopton Wood Stone.**—This is a fine-grained, grey, marble-like stone, excellent for all weathering purposes, and used for steps and paving. I should think it would answer well for monumental purposes, and it takes a polish. One authority says, "it is useful for all internal and external purposes, and is a good weather-stone, including monumental work." It is hard and crystalline.—AN ARCHITECT.

CHIPS.

Messrs. John Knowles and Co., of 38, King's-road, St. Pancras, N.W., have been awarded by the judges (Mr. Rogers Field, C.E., and Mr. Baldwin Latham, C.E.) of the Health Exhibition, Portsmouth, held under the auspices of the Sanitary Institute, a certificate of merit for the patent seat action and flushing tank of the "Presto" closet exhibited by them, a full notice of which was given in our issue of June 3 last.

Mrs. Creighton has prepared a scheme for raising several thousand pounds towards the restoration of Peterborough Cathedral, through lady collectors in every parish in the diocese. It is termed a "Women's Fund for the Restoration of the Cathedral Organ and the completion of the Choir fittings." A large general committee has been formed, and £746 has already been promised.

The second excursion for 1892 of the Dundee Institute of Architecture, Science, and Art, will take place to-morrow (Saturday), when Clatto reservoir, and places of interest in the districts of Auchterhouse and Meikle will be visited. At Clatto, Mr. George S. Baxter, water engineer of Dundee, will explain the plans adopted, and also the mode of laying the pipes.

The Norman church of St. Nicholas, North Newbald, near Market Weighton, was reopened on Thursday in last week by the Archbishop of York after restoration. Rather over £400 has been spent in re-roofing the transepts and the vestry, repairing the pinnacles and parapet of the tower, and carrying out minor improvements in the interior.

A large stained-glass window has just been placed in Ingrow Church. The window illustrates the Good Shepherd, the Good Samaritan, and the Lost Piece of Silver, placed in the upper, middle, and lower spaces respectively. Each subject is surmounted by canopy work. The window is from the studio of Messrs. Powell Brothers, of 30, Park-square, Leeds.

A special meeting of the executive committee of the Swansea Harbour Trust was held on Wednesday, when Mr. Law, superintendent of the Hull Alexandra Dock and Railway, was appointed superintendent at a salary of £800 a year.

The Queen has commissioned Messrs. Matthews and Mackenzie, architects, of Aberdeen, to prepare plans for a new church to be erected on the site of the present ancient, but now almost ruinous, edifice at Crathie, in which Her Majesty has so frequently worshipped. Mr. Mackenzie has had an audience with the Queen on the subject.

Dissolution of partnership is announced in Tuesday's *London Gazette* as between Helyer and Munt, of Bournemouth, architects and surveyors.

The electric lighting of the Smithfield Markets is rapidly approaching completion. Under the contract, which is being carried out by Messrs. Julius Sax and Co., on behalf of the City Corporation, the tenants of the markets will not be put to any expense in the installation of the light upon their premises, and they will only be charged the same amount that they have been paying for gas.

Legal.

"OPEN AND UNBUILT UPON."

THESE words are often used in covenants to keep a square or garden that is surrounded by buildings in its then state as an open space, to admit of free light and air to the adjoining premises. In the recent case of "Graham v. Corporation of Newcastle-on-Tyne" (*Times*, July 24), an action was brought by the plaintiff, the owner of certain houses in Charlotte-square, Newcastle, to prevent the corporation from erecting a public urinal in the square. The covenant provided that the garden or open space in the centre of the square should "for ever thereafter be kept open and unbuilt upon." It appeared that the square was in the shape of a hill, and was supported by a high retaining wall. The defendants had begun excavating the ground, and were about to put up a public urinal in the square, with an entrance through this wall, but so built that it would, even when completed with a glazed and concrete roof, be in every part below the level of the adjoining surface. The plaintiffs now sought for an injunction to stop this being done, on the ground that it would be a breach of the covenant to keep the square "open and unbuilt upon"; and also on the further ground that a urinal so placed would be a nuisance to the surrounding houses.

Mr. Justice Kekewich first of all got rid of the word "garden" in the deed by holding that it only meant the same thing as an open plot of ground, because it was admitted that the land in question had never been used as a garden of any sort. In other words, as it had been an "open space," it was to be kept so for ever. This meant, he held, that it should be free from obstruction, and so that the air could circulate without being interfered with by any building. He considered that the words "and unbuilt upon" were simply an enlargement of the term "open," and did not carry its meaning any further. The learned judge further considered that other ground might be built upon and still remain open; and he instanced a greenhouse as a building that would not be any obstruction to light and air. Having thus whittled away most of the covenant, he then held that the building proposed to be erected by the corporation, and being practically underground, would not interfere with the space continuing to be "open" in the sense he had explained. As to its being a nuisance, that did not necessarily follow from the fact of its being a urinal, and, at all events, that question would be raised when the work was done, and evidence could be brought of the results. So the motion for an injunction was dismissed; costs to abide the result of the action. But all the same, it is pretty clear that a public urinal built in a square, however elegantly it may be sunk and roofed in, must damage the surrounding dwelling-houses as property, and must be a nuisance to the tenants. Perhaps the Court of Appeal will be asked more clearly to define the words "open and unbuilt upon."

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

SUFFOLK.—DILAPIDATIONS.—LEASE.—I answer these questions as asked; but much must depend on the age, quality, and condition of the property. 1. The landlord. 2. Landlord. 3. I think not. 4. If in a very bad state. 5. If very bad, as they were before. 6. I think not. 7. Painted.

BANBURY.—MORTGAGE STAMP.—The proper stamp on a mortgage for £100 would be 2s. 6d.; and so on upwards, according to the scale in the Stamp Act, 1891.

LEGAL INTELLIGENCE.

CHURCH RESTORATION WITHOUT A FACULTY.—Judgment has been given in the Consistory Court of Hereford refusing a confirmatory faculty for alterations made by the vicar and churchwardens of Upton Bishop, by which an Early English doorway in the chancel had been destroyed, and a vestry erected as a memorial to the late Miss F. R. Havergal materially injured, without the consent of her relatives, in order to place an organ in the chancel. The case was reported in our issue of July 1st, p. 33, present volume. Dr. Tristram now said the petitioners had committed a serious offence against ecclesiastical law, and that had restoration to its former condition been practicable, they would

have been required to effect such restoration at their own cost. The vicar was ordered to pay the costs of Messrs. Havergal, who had opposed the faculty, after objecting to the alterations.

RE F. STEVENS.—The adjourned examination of this bankrupt, a builder, of East Grinstead, took place on the 22nd inst. The debtor said he started business in East Grinstead in July, 1888, having no capital, but with £150 borrowed money. The firm was styled Pierce and Baynard, he being known as Baynard. He was also in business at Durham, Harlesden, Finchley, and other places. He took contracts, but for the last two years had made no profits. He never had any working capital, but believed his balance at the bank in 1890 was £200 or £300. He had only taken two or three contracts, on all of which he had lost money. When Head's Bank stopped in February he admitted that he had many dishonoured bills about. The Official Receiver pointed out that, as a matter of fact, in June, 1890, there was an adverse balance in the Bank against him of £816, and in September of the same year that had increased to £2,713, and afterwards to £4,894. He left this country, and went with his wife and children to America, where he stayed a year, and came back to Stamford Hill, where he was a builder's foreman. The examination was adjourned until October 13th.

BAD PLASTERING.—On the 27th September, at the Lambeth Police-court, before Mr. Biron, Q.C., Mr. Charles Watts, builder, was summoned at the instance of Mr. Ellis Marsland, district surveyor for Camberwell, for a breach of the by-laws relating to plastering at a certain house in course of erection in the Worlingham-road, East Dulwich. The surveyor produced several specimens of the plastering taken from the walls and ceilings of the building, also two analyses of the material, showing from 15 to 18 per cent. of earthy matter, and explained that the defendant had a mortar-mill, and surrounding it were heaps of all sorts of rubbish which was ground up in the mill with a small proportion of lime and hair. Whereas the by-laws provided that clean, sharp sand, without loam or earthy matter, or ground brick or furnace slag, to the satisfaction of the district surveyor, mixed with lime in the proportions of three to one, were the only materials allowed to be used, with the addition of hair. The magistrate fined the defendant £5 and 2s. costs.

WATER SUPPLY AND SANITARY MATTERS.

HIGHCLERE PARK.—The waterworks on the estate of the Earl of Carnarvon at Highclere Park, which have been in process of construction for some time, were put to a practical test on Friday afternoon, particularly as regards their efficiency in case of fire, by the Newbury Volunteer Fire Brigade. The works have been designed and carried out by Mr. Richard Ravenor, of Newbury. The pumping-station is about two miles from the reservoir, and the water-supply is obtained from springs and collected into an underground tank, and from thence into one above ground, and it is from the latter that the power for working the hydraulic ram is obtained. The ram is worked on the continuous-flow principle, and will supply the castle, stables, and flower-gardens, as well as the dairy and home farm. The reservoir, which is on Siddown Hill, is capable of holding 135,000 gallons, and its height above the ram is 400ft., and above the flagstaff tower of the castle 30ft. It is constructed of concrete, and has a flat covering of the same material. A fire main connected with this reservoir is laid completely round the exterior of the castle, and hydrants are placed so as to connect the hose in case of fire. A fire main runs up through the centre of the building inside, with hydrants on each floor, and 60ft. of hose, with branch-pipe attached to each.

MACCLESFIELD.—The corporation of Macclesfield, having been urged and threatened by the joint-committee of the Irwell and Mersey, have at last decided to undertake a main-drainage scheme, the estimated cost of which is put down at from £20,000 to £30,000. At the beginning of 1888 the corporation offered 100 guineas in competition for plans, estimates, and reports as to the carrying out of the River Pollution Act in the borough. This resulted in a number of plans being sent in, and the prize was awarded to Mr. W. H. Radford, C.E., of Nottingham, the competitive plans becoming the property of the corporation. Still the council delayed in carrying out the project, and in May of this year a deputation waited on the joint-committee of the Mersey and Irwell at the Manchester Town-hall to explain why proceedings should not be taken against the corporation in respect of their failure to deal with the sewage. The corporation said they had not been able to agree as to the best system to adopt, irrigation or precipitation, and the committee allowed them a further period of three months. In June Mr. John Newton, C.E., of Manchester, who was consulted by the sanitation

committee, recommended an irrigation scheme, which was adopted, Mr. Radford, of Nottingham, being appointed the engineer. Mr. Radford is now engaged drawing up a new plan.

NELSON, LANCS.—Water was on Friday for the first time allowed to enter the new compensation reservoir constructed at the foot of Pendle Hill, about five miles distant from Nelson. The ceremony was formally performed by the mayor of Nelson, who also formally opened the new filter beds constructed in the Ogden Valley, about a mile distant from the new reservoir. The beds and the reservoir have been designed by Mr. John Newton, engineer, of Manchester, and have been constructed by Messrs. Etheridge, Clark, and Co. The reservoir, which has a holding capacity of 40,000,000 gallons, was commenced about 18 months ago. It impounds the Black Moss stream, and is the first of a series of reservoirs to be constructed by the corporation of Nelson under the authority of an Act obtained four years ago. The filter beds are two in number, and are constructed in the Ogden Valley at an elevation of 900ft. above the sea level. They have each a holding capacity of 700,000 gallons, and by a 10in. main leading into them from the Ogden stream 600,000 gallons (equal to about a day's consumption in Nelson, Brierfield, and Barrowford, all of which places come within the district supplied with water by the Nelson corporation) can be dealt with daily. In addition to the source of supply the corporation are possessed of two service reservoirs, with a combined accommodation for 85,000,000 gallons. The sanction of Parliament is also obtained for the construction of two reservoirs, each to hold 40,000,000 gallons, on the Ogden stream above the filter beds, and another to accommodate 180,000,000 at a lower level than the beds. The scheme when completed will place the Nelson corporation in a position to supply a population of 100,000 with water. As compensation for the appropriation of the Ogden stream the corporation will be required to construct, in addition to the existing compensation reservoir in Walverden and the new compensation reservoir, another reservoir near the one just constructed at Black Moss, at the foot of Pendle Hill. The cost of the reservoir opened on Friday is about £10,000.

STATUES, MEMORIALS, &c.

THE DRAKE MODEL AT EXETER.—Devonshire is probably the only county in England where three statues, all facsimiles of each other, exist. The hero of this monument is Sir Francis Drake. His monument, crowned by a bronze figure of the sturdy sea-dog himself, is at Tavistock, and a replica graces the Hoe at Plymouth. Exeter has just acquired Sir Edgar Boehm's original model of the actual work, and has had it erected in the reading-room of the Albert Museum in that city. The sculptor's executors presented this fine study to the South Kensington authorities, and the latter in their turn gave it to the City of Exeter. The statue is of plaster of Paris, painted a bronze colour. It is 12ft. high, and weighs just upon a ton. Unfortunately, in transit from London the figure got broken into no less than 200 pieces, and headless and armless, little more than the actual torso remained intact. In this dilemma, the Museum Committee, put the fragments in the hands of Mr. Harry Hems, of that city, with the ultimate result that the pieces have been so matched and joined together that it is now impossible to see that any accident had ever taken place. The success of this delicate task has been in a large measure due to the courtesy of Mr. Robert Glassby, sculptor, of Holbury-street, Chelsea, son of the late Mr. R. Glassby, managing artist to the Court sculptor, Mr. Harry T. Hems, jun., has carried out the actual work of renovation with the aid of the original small medallion modelled for the colossal statue.

The city council of Rochester have finally approved a new code of building by-laws.

The first portion of the memorial to the late Bishop Lightfoot is rapidly approaching completion, and the cenotaph monument will be unveiled in the choir of Durham Cathedral on the 20th of October by the Earl of Durham, the Lord Lieutenant of the county. The commission to execute the cenotaph was placed with Sir Edgar Boehm, who died whilst his work was in progress; it has, however, been completed by Mr. Alfred Gilbert, A.R.A.

A building situated in Parson-street, Glasgow, and to be known as St. Mungo's Passionist Monastery, is now being completed. Built of red sandstone, the building measures 80ft. by 50ft., and, besides a basement, consists of three floors. It is Gothic in style, and adjoins the Catholic church. On the basement are rooms for a mission library and societies. The first floor contains the library, refectory, a community room, and three public reception rooms. On the second and third floors are 16 bedrooms, and on the third floor is also built an oratory. The Rev. Father Osmond Cooke, of Paris, is the architect. The cost exceeds £14,000.

Our Office Table.

THE Borough-road Polytechnic is to be opened by the Earl of Rosebery to-day. The building comprises the old British and Foreign Training College, with various additions made at different times, full of dark passages, and rooms located on many levels. Some £12,000 has been so far expended, under the direction of Mr. Rowland Plumbé, F.R.I.B.A., in converting the structure into a more convenient shape for the purposes of the present institution; and no doubt the work presented a somewhat difficult problem, on which considerable ingenuity has been expended. The main portion of the new work has yet to be carried out, by building a large assembly hall to seat 1,500 people, and a big swimming-bath on the vacant land to the rear of the existing institute. The usual scheme of an educational character comprises the programme, with gymnasium, social club, and reading rooms, and all kinds of amusement. Clubs are in anticipation, with excursions, and a "House of Commons." Among the items for women is a laundry, to teach washing, with small appliances. This latter, anyway, is a practical idea.

PROFESSOR ROGER SMITH will inaugurate the courses of lectures on architecture to be held at University College, London, through the coming winter with a public lecture to be delivered at the college on Thursday evening, October 6th, at 7.20, taking as his subject "Architecture an Art, a Science, and a Profession." The usual classes on Architectural History and Construction and Modern Practice will commence the following week, and a new feature of considerable importance is the establishment of evening classes for both architectural and constructional drawing at such moderate fees as to bring them within reach of all students.

THE Liverpool Architectural Society has just arranged for a series of classes to be held during the coming winter months to assist in the professional education of architectural students. The classes will be free to students joining the society, and are intended to be a preparation for the R.I.B.A. examinations; they will also assist the student in his office work. The classes will meet every Thursday evening, from 6.30 to 7.30, in the library of the society, Delta-chambers, 15, Cable-street, Liverpool. An examination will be held at the close of the session, and prizes awarded by the council. The subjects to be dealt with in the lectures are: "Sanitation," to be dealt with by Mr. T. Harnett Harrison; "Stresses in Structures and Shoring," Mr. J. Dod; "Building Construction," Mr. David Lyon; "Specifications and Quantities," Mr. H. L. Beckwith; "History of Architecture," Mr. H. W. Keef; and "Mouldings, Features and Ornament," Mr. C. E. Deacon.

At Tuesday's meeting of the London County Council, the chairman read a report of the Building Act Committee, in which attention was called to the conviction of Mr. Henry Parsons, of Shakespeare-road, Loughborough Junction, the district surveyor for South Lambeth and part of Camberwell, for riding on the London and South-Western Railway Company's line for a long period without having paid his fare. He was fined 40s. and five guineas costs on each of two summonses. The committee recommended that Mr. Parsons should be suspended from his office, and this was agreed to.

THE first of a series of lectures and demonstrations for the special instruction of sanitary officers was given at the Free Library, Liverpool, on Saturday afternoon, under the auspices of the Sanitary Institute and the Technical Instruction Committee of the Corporation of Liverpool. The lecturer was Mr. Louis Parkes, M.D., D.P.H., medical officer of health for Chelsea. In his introductory remarks, Dr. Parkes explained the work that was being done by the Sanitary Institute, adding that some people thought that sanitary legislation was going too far, but he was not one of those, especially when he had regard to the circumstances that surrounded people in large towns. He believed in the proper training of sanitary inspectors. Some years ago almost anyone was considered good enough to be a sanitary inspector—a carpenter, a butcher, and so on—and, of course, such men were ignorant of their duties. Now, however, the men selected for such posts must have had a good training and have passed examinations; in fact, some local boards

and authorities stipulated now that the men appointed should be so qualified. In the face of these important facts it was necessary that they should acquire all the knowledge they could in sanitary matters. Dr. Parkes then proceeded with an address on "Ventilation, Heating, and Lighting." To-morrow (Saturday afternoon) Mr. H. Percy Boulnois, city engineer, Liverpool, will lecture on "House Drainage and Sanitary Appliances."

Though shorthand and typewriting have attracted many to this field of labour, so extended has become the area in which shorthand is used, and so generally is the typewriter being adopted, that there is always a demand for well-educated young men and women who write a fair speed in shorthand and can operate the typewriter to good effect. It has been said that a practical knowledge of shorthand and typewriting is more valuable to young people in these days than a smattering of the classics. Very good salaries have been and are being earned by thousands of male and female operators, and though doubtless the inefficient find it harder work to find appointments of any value than was once the case, those who are fitted for this class of work and have gone through a special course of training for it, such as can be obtained at the Yost Typewriter Company, 40, Holborn-viaduct, need have little fear but that their services will be in demand, and will be adequately rewarded. The Yost Institution offers exceptional facilities for rapidly acquiring shorthand and typewriting. Tuition is individual, and the Yost typewriter, which is everywhere so well spoken of, is taught free to students of the Shorthand School, purchasers of machines, and certain clerks in H.M. Civil Service. Shorthand and typewriting combined are working a revolution in business methods, and, quite apart from the question of daily occupation and bread winning, no one who would be abreast of the times should be without some knowledge of these wonderful labour-savers.

MEETINGS FOR THE ENSUING WEEK.

THURSDAY.—University College, London. Inaugural lecture by Professor Roger Smith, F.R.I.B.A., on "Architecture an Art, a Science, and a Profession." 7.30 p.m.

FRIDAY.—Architectural Association. Conversazione at the Imperial Institute, South Kensington. 8 p.m.

The Architectural Association, 9, Conduit Street, W.; and 56, Great Marlborough Street, W.

THE ARCHITECTURAL ASSOCIATION COURSES OF LECTURES, CLASSES, AND STUDIO INSTRUCTION WILL COMMENCE ON MONDAY, October 10.

The Courses are both Elementary and Advanced, and are designed to provide a sound professional education, supplementary to that to be obtained by the prevailing system of pupillage. The Course, which is in four divisions, is progressive and consecutive, and the instruction is given by Lectures and Instructors of known ability.

DIVISION I.

LECTURES AND CLASSES.—The Orders of Greek and Roman Architecture, Building Materials, Perspective, Physics.

THE STUDIO.—Drawing from Ancient Examples, Freehand Drawing, Drawings of Examples of Elementary Construction, Plane Geometry, Criticism Meetings.

DIVISION II.

LECTURES AND CLASSES.—English Architecture, Materials, Elementary Ornament and Colour Decoration, Strength of Materials, Stresses and Strains.

THE STUDIO.—Designs based upon Ancient Examples, Freehand Drawing, Drawings of Examples of Elementary Construction, Solid Geometry, Criticism Meetings.

DIVISION III.

LECTURES AND CLASSES.—The History of Architecture, Materials, Colour Decoration, Sanitary Science as applied to Drainage and Water Supply.

THE STUDIO.—The Design and Construction of Modern Buildings, Freehand Drawing from Casts, Perspective and Sciography, Constructive Masonry, Criticism Meetings.

DIVISION IV.

LECTURES AND CLASSES.—The History of Architecture; Sanitary Science—including Ventilation, Lighting and Heating, Painting, Sculpture; other Arts allied to Architecture; Professional Practice—including Legislative Enactments relating to Building Contracts.

THE STUDIO.—The Design and Construction of Modern Buildings, Freehand Drawing from Casts, Drawings of Ancient Buildings from actual measurement, Graphic Statics and Perspective, Criticism Meetings.

EXTRA SUBJECTS.

LECTURES AND CLASSES.—Plane and Solid Geometry, Geology, Mensuration, Land Surveying and Levelling, Chemistry of Building Materials, Quantity Surveying—including the Preparation of Estimates, Discussion Section.

THE STUDIO.—Sketching and Measuring, Elementary Water Colour Class, Water Colour Class, Modelling.

A Pamphlet, containing full particulars of the curriculum, may be obtained free on application to the Hon. Secs., at 56, Great Marlborough-street, London, W. Fees must be paid in advance, and passes may be obtained at the Offices of the Association, between Ten a.m. and Seven p.m.

THE OPENING CONVERSATION will be held on FRIDAY, October 7, at Eight o'clock, at the Imperial Institute, South Kensington. The Exhibition of Prize Drawings and the last Session's Work of the Students, and the Award of Prizes, will take place at the ANNUAL GENERAL MEETING of the Association, to be held on October 21, at 9, Conduit-street, W., at 7.30 p.m.

ERNEST S. GALE,
F. T. W. GOLDSMITH, } Hon. Secs.

Trade News.

WAGES MOVEMENTS.

ABERDEEN.—The plasterers' labourers in this city struck work on Friday on account of the masters having declined to grant an increase of wages from 4½d. to 5d. per hour.

LONDON DISTRICT.—It is reported that as a consequence of the reduction in working hours from 55 to 52 hours per week, and the increase of the rate for overtime from 1d. to 3d. per hour, both masons and carpenters are better employed than usual, and prospects are good for the coming winter.

National Registration of Plumbers—List of Registered Plumbers.

LONDON JOURNEMEN.

Early, D., 18, Dallas-road, Sydenham, S.E.
Groves, J. E., jun., 17, Dallas-road, Sydenham, S.E.
Scott, J. J. L., 12, Little College-street, Chelsea, S.W.

PROVINCIAL MASTERS.

Anderson, C., 2, Marshall-place, Crief, N.B.
Rae, W., 2, Russell-street, Dundee.
Whitton, A. A., 71, Victoria-road, Dundee.

PROVINCIAL JOURNEMEN.

Adam, T. M., 6, Tait's-lane, Dundee.
Cathro, W., 16, Annfield-row, Dundee.
Ferguson, A., 13, Midkirk Style, Dundee.
Gourlay, J. F., Asylum-cottages, Melrose, N.B.
Hampton, D. M., 11, Reform-street, Montrose.
Henderson, D., 31, Charles-street, Dundee.
Law, J., 83, Cowgate, Dundee.
Lumsden, D., Cupar Muir, Cupar, Fife.
Miller, W. D., 27, West Port, Dundee.
Ritchie, P., 27, Jamaica-street, Edinburgh.
Sandilands, D., 46, Balfour-street, Leith-walk, Leith, N.B.
Turnbull, J., 18, Bell Street-lane, Dundee.
Winter, C., 3, Avondale-place, Dundee.

CHIPS.

Further reparations are proceeding on the exterior of the *chevet* of Notre Dame, Paris. All the flying buttresses of that portion of the cathedral, having suffered from the weather, are to be reconstructed; extensive repairs are required to the roofs of the choir and nave; and the traceries of some of the windows are in need of repair.

Further restorations of the parish church, Dewsbury, have been decided upon. Already £20,000 has been spent upon the rebuilding of the chancel and transepts, at first from plans by the late Mr. G. E. Street, R.A., and afterwards under Mr. Arthur E. Street and Mr. A. H. Kirk, of Dewsbury, as joint architects. It is now intended to proceed with a complete restoration of the nave. The interior of the new church was illustrated in our issue of June 17, 1887.

The memorial stones were laid at Burslem on Monday of a Miners' Hall for the use of the North Staffordshire Miners' Federation. The building, which is situate in Moorland-road, adjoining the proposed park, will be a red-brick structure, and will comprise a residence for the miners' agent, offices, committee-rooms, and an assembly room. The assembly-room, which will be used for general meetings of the Federation, is 30ft. by 21ft., and is on the first-floor over the offices and committee-rooms. The large committee-room, which will also be used as a council chamber, is 22ft. by 15ft. The building will cost about £1,500. The plans have been prepared, and the work is being carried out under the supervision of Mr. G. L. Jones, architect, of Waterloo-road, Burslem, and the contract of Mr. W. Cooke, of Burslem, has been accepted.

The directors of the Goole Gas and Water Company, Limited, in order to meet the growing demands of the town, propose to extend their gas and water plant, and to effect this a call of £37,000 is to be made. Boring operations for a new water-supply commenced on Monday near Beaver's Bridge, about six miles from Goole, and it is proposed to build additional gasworks at Rawcliffe Bridge.

Stamford Park has now become the joint property of the Corporations of Ashton-under-Lyne and Stalybridge, and a considerable amount of money is being spent by the two authorities in the construction of ornamental ponds, the extension of forcing houses for plants, and in other improvements. Chadwick's Dam, a large deep lake, which, though outside the park boundary, forms a portion of the same property, is to be so far filled up that the depth shall not exceed 4ft. Mr. J. Eaton is the architect, and Mr. J. Robinson the contractor.

Holloway's Ointment and Pills.—Reliable Remedies.—In wounds, bruises, sprains, glandular swellings, enlarged veins, neuralgic pains, and rheumatism, the application of this soothing Ointment to the affected parts not only gives the greatest ease, but likewise cures the complaint. The Pills much assist in banishing the tendency to rheumatism and similar painful disorders.

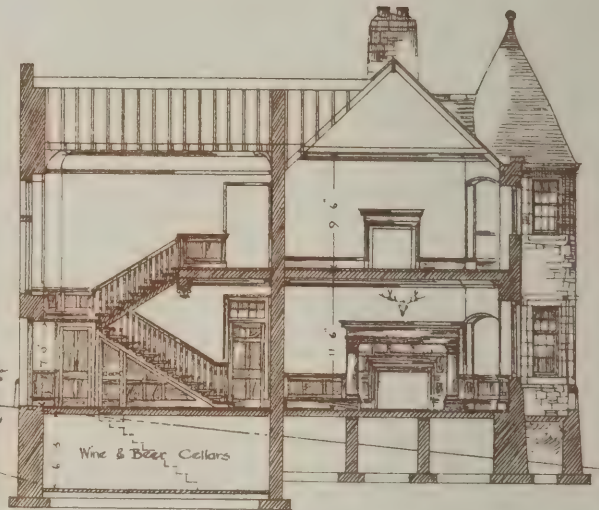
BILLS OF QUANTITIES & PLANS.

T. PETTITT and CO. Lithograph Bills of Quantities with the greatest expedition. Accurately copied from the draft in clear hand. Orders from the country returned by evening mail on the same day. Terms on application. Also Plans of Building Estates and General Plan Work at very reduced prices.—T. PETTITT and CO., Lithographers, 28, Fitch-street, Soho, London, W. Established 60 years.

PLACED FIRST



Side Elevation.
(S.W.)



Section A.B.



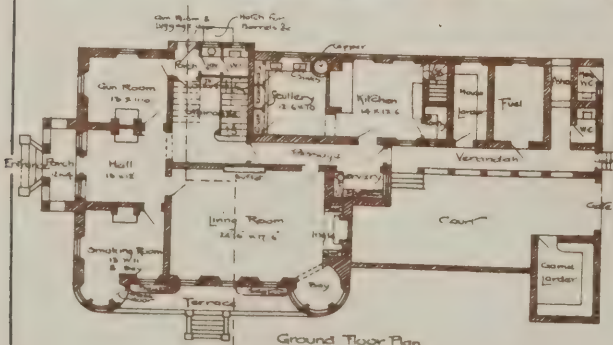
Front Elevation.
(S.E.)

BND.C.

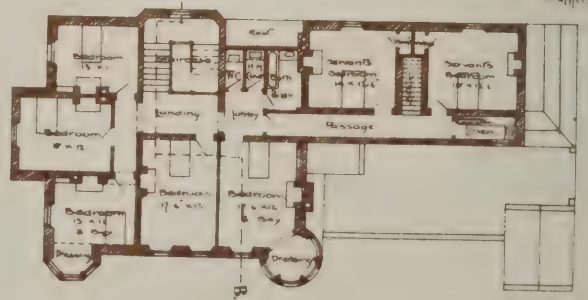
DESIGN FOR

A SHOOTING BOX.

BY "VULCAN."



Ground Floor Plan.

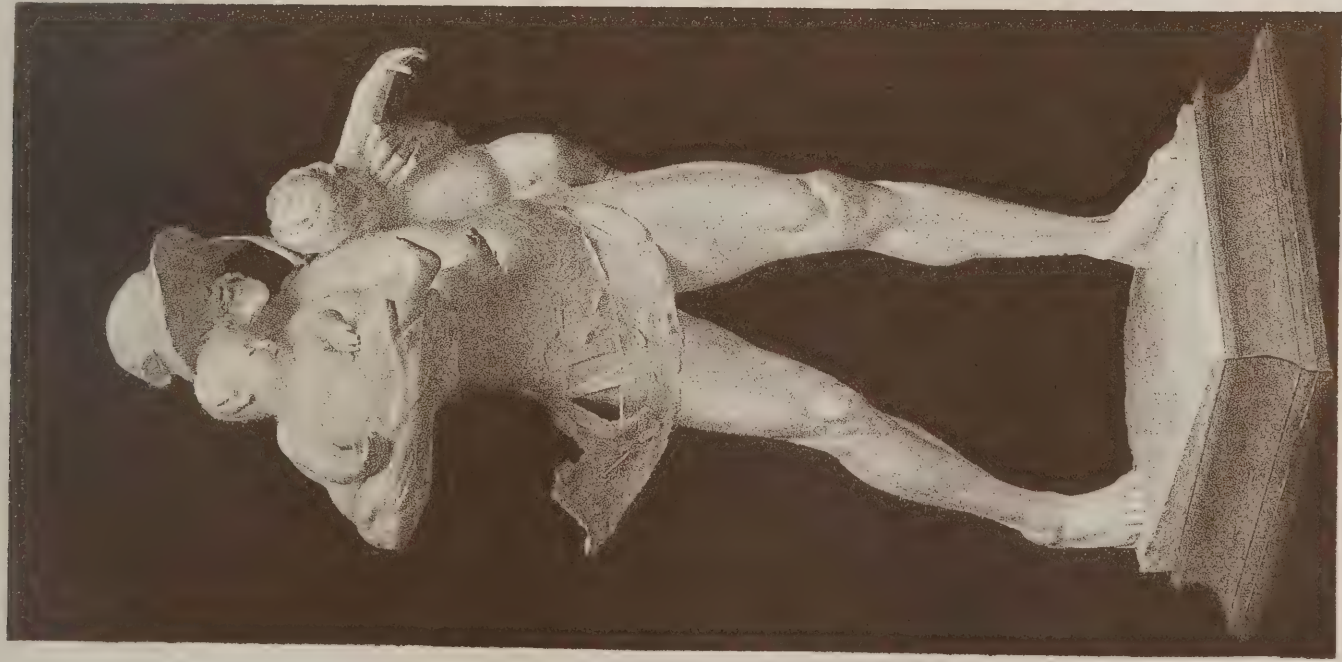


First Floor Plan

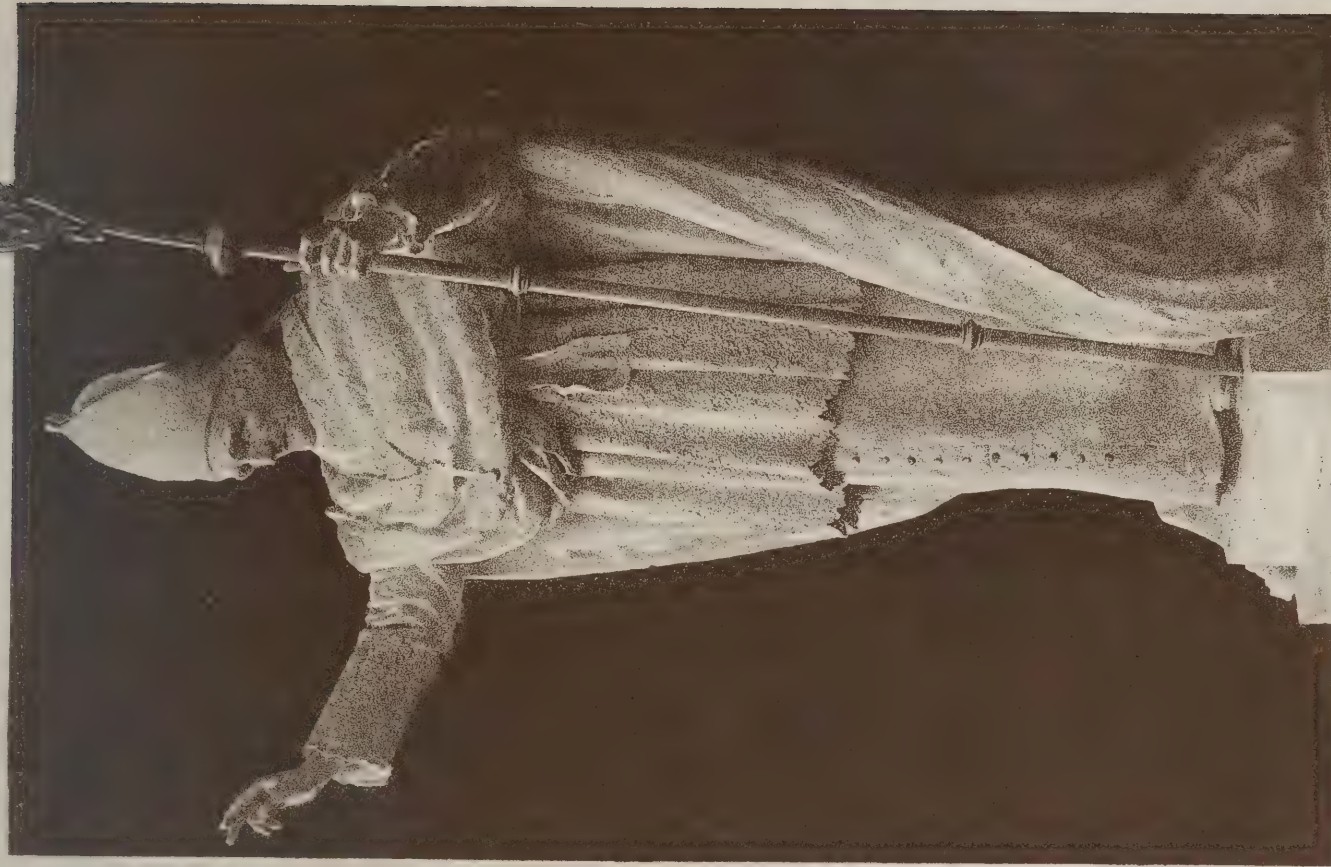


Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

NEW CLUB UNION PREMISES, HOLBORN, W.C.



"THE CHILDREN OF THE WOLF" BY GEORGE FRAMPTON.



CARDINAL MANNING BY G. DE BENIGNY-PUYVALLEE.

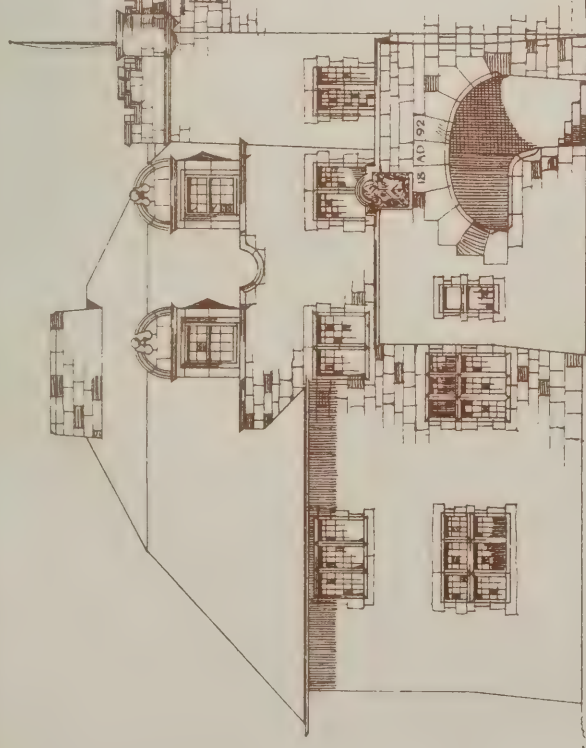
James Akerman, London.

SCULPTURE FROM THE ROYAL ACADEMY & THE SALON. 1892.

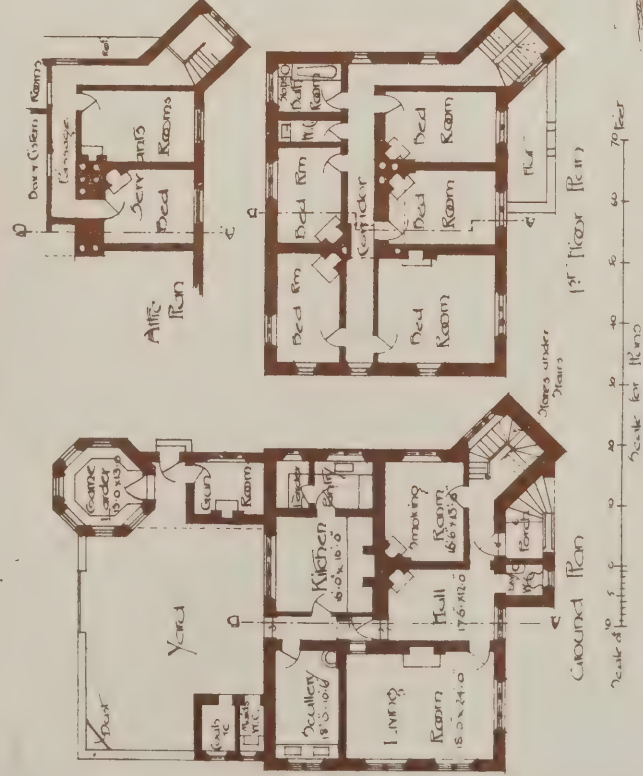
"BUILDING NEWS" DESIGNING CLUB:

A Small Shooting-Box: by

"Nil Nisi Bonum:"



FRONT ELEVATION



SIDE ELEVATION

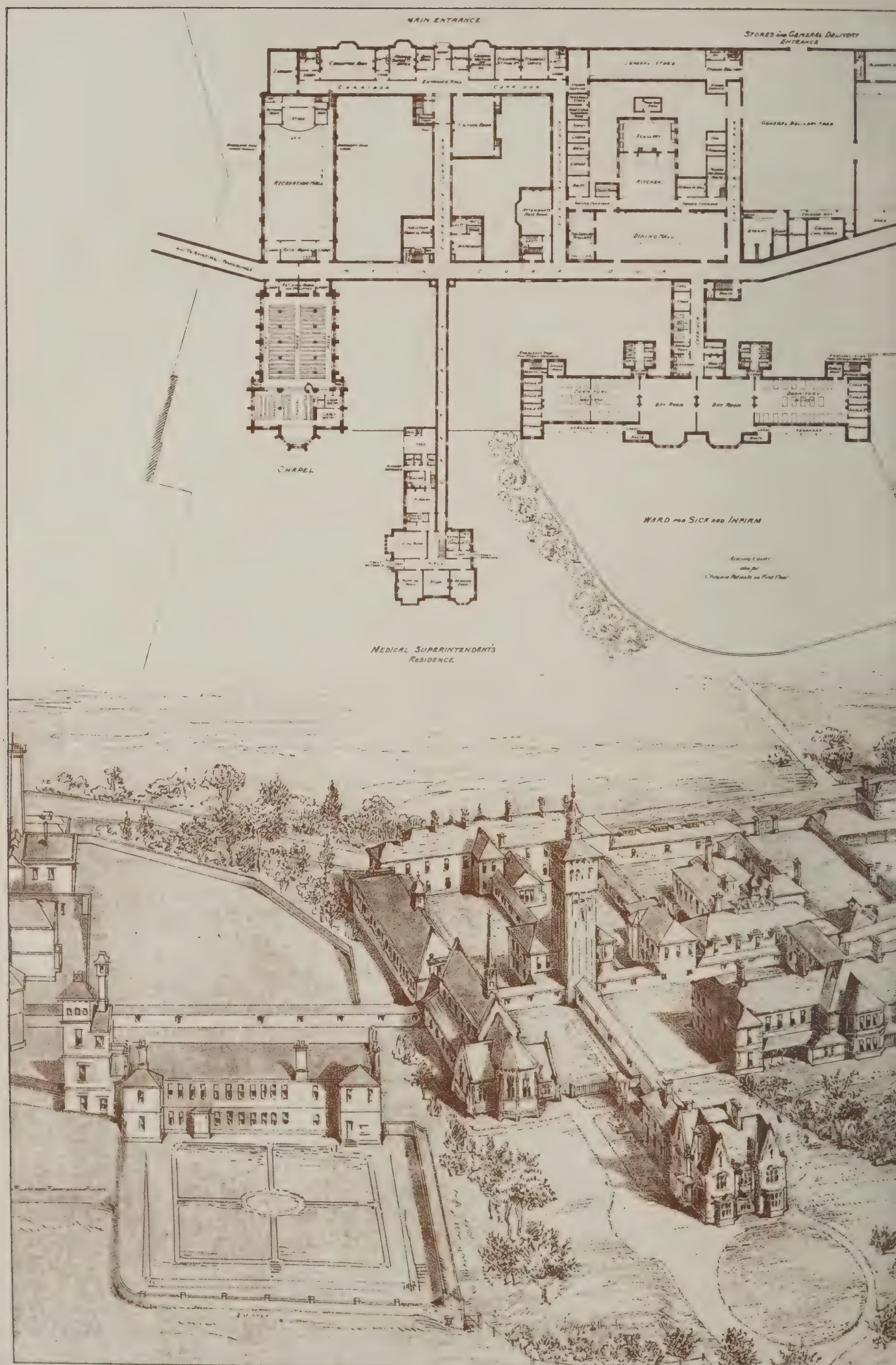


Grade for Section and Elevations:

PLACED · SECOND ·



SECTION.



GROUND PLAN

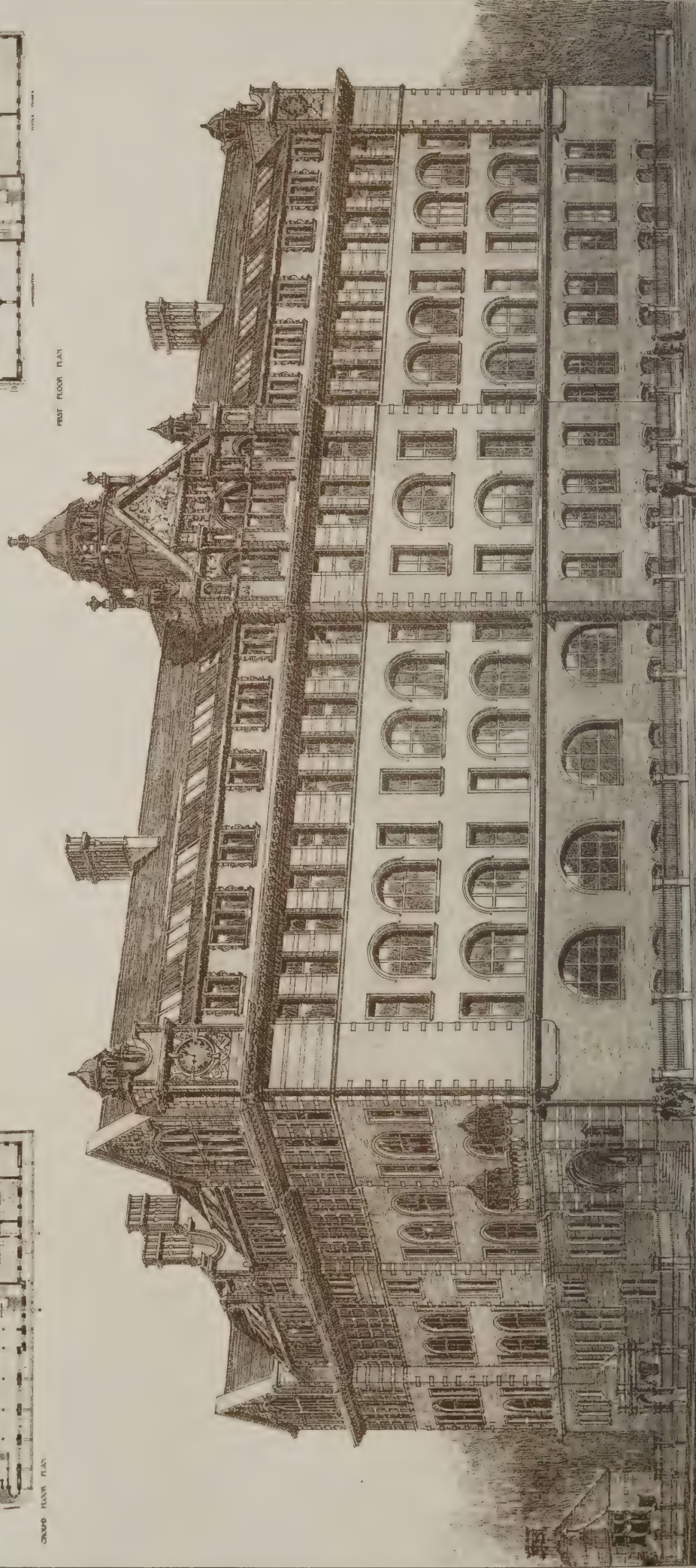
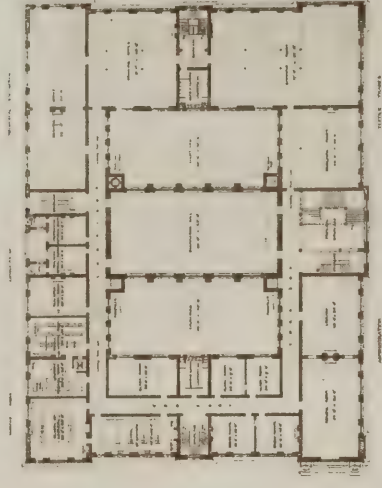
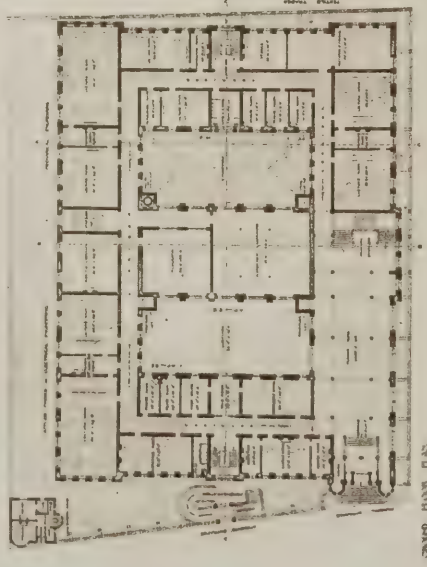
SECOND PREMIATED DESIGN
 COXLODGE LUNATIC ASYLUM
 NEWCASTLE ON TYNE.
 MONTGOMERY & CARR
 ARCHITECTS

"PHOTO-TINT", by James Akerman, 6, Queen Square London, W.

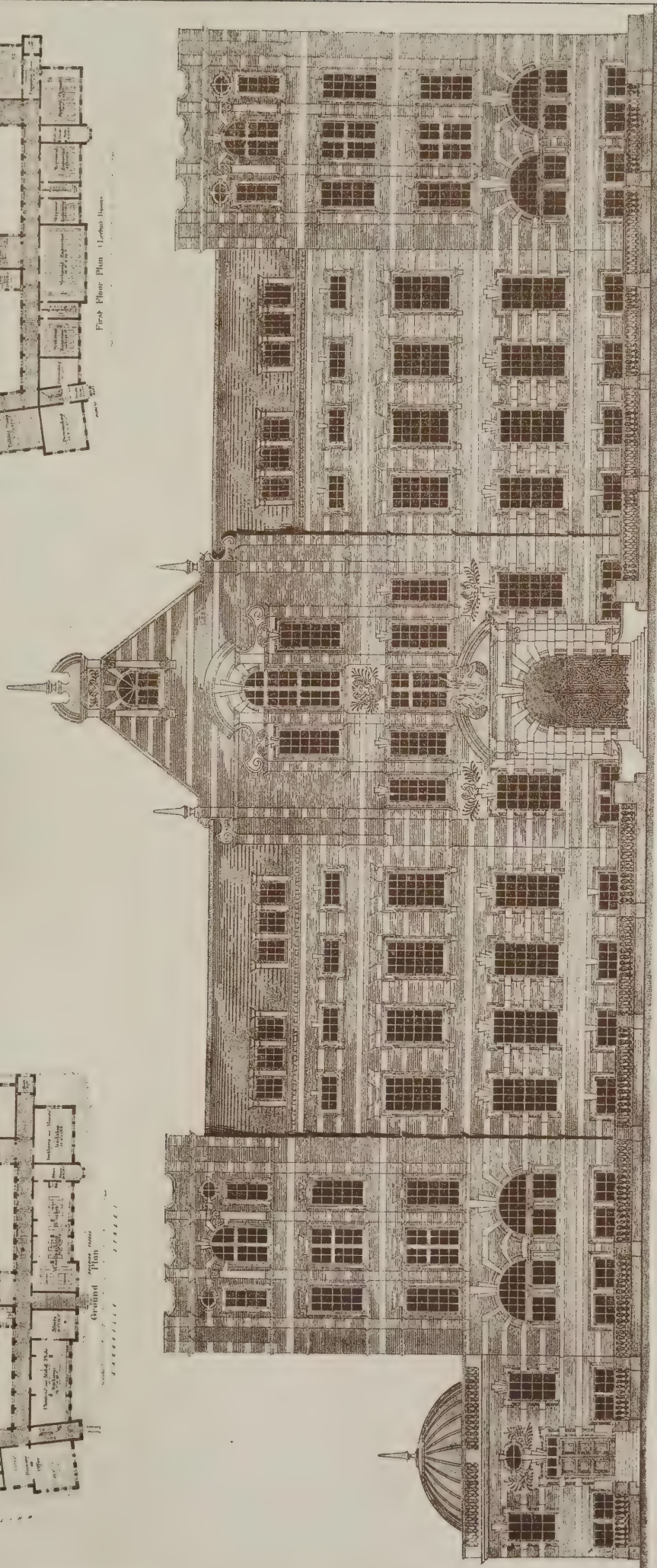
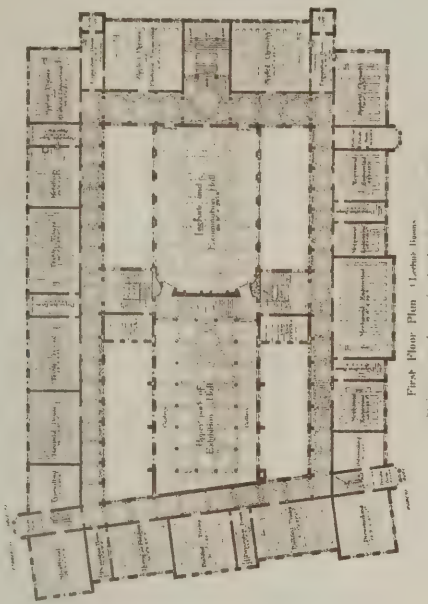
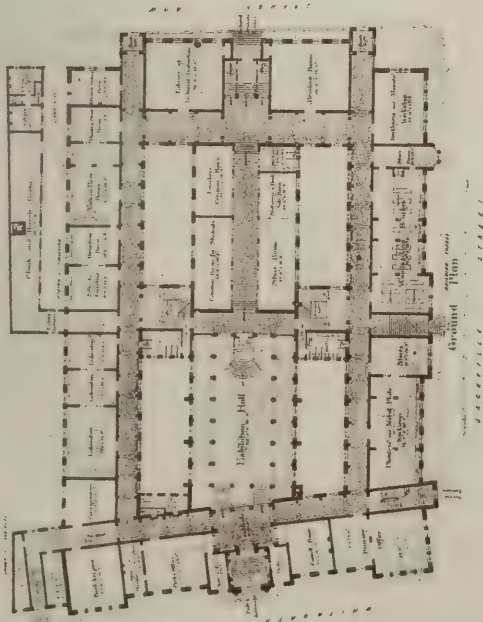
MANCHESTER TECHNICAL SCHOOL COMPETITION.

SECOND PREMIATED DESIGN

BY MESS^{RS} GIBSON & RUSSELL, ARCHITECTS.



THIRD PREMIAED DESIGN
 BY MESS^{RS} RUNTZ & FARROW, ARCHITECTS.



Elevation to Whitworth Street

THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1970.

FRIDAY, OCTOBER 7, 1892.

AMATEURS AS CLIENTS.

WE are most of us amateurs, in one art or another. When a busy man has, for the time, got through his own business, and wants a little amusement, he generally finds it in taking up, only half-seriously, the business of somebody else. He tries what it is to be a boatman or a sailor, a farmer or a gardener; or, if his fancy is for mechanical work, he buys a lathe or a set of tools. In his own profession he has a poor opinion of dilettante aspirants; but when he gets outside it, and becomes one of them himself, he sometimes thinks more highly of his efforts than he ought to think. This is the case even in those arts which, as everybody admits, require a previous training. How natural, then, that it should be so in our own—of which few outsiders ever learn enough to discover that it even needs learning. The builder who has put up, "out of his own head," a row of houses in an East End suburb, fancies himself an architect; and the gentleman of leisure, with some taste and some faculty for sketching, is possessed with the same idea, on rather better grounds.

The world thinks highly of the amateur architect. If he has suggested a plan, popular belief gives him the credit of the whole performance, including design, construction, details, and superintendence. Go, for instance, to the Oxford University Museum. It was thought a marvel once, in the palmy days of Ruskinism, when the eloquence of the "Seven Lamps" and the "Stones of Venice" made the public fancy for a brief space that flabby naturalistic carving was a noble thing. The details, which were its glory once, are rather its disgrace now the world is wiser; and yet there are marks of genius in the work which show that its author was no ordinary man. Though led astray for the time by the delusions of his day, he was too inventive and original to have been detained by them long; and had he lived, he would probably have become a leader amongst us. No other architect could have produced the Oxford Museum; and yet its architect's name is hardly mentioned there. The attendants tell you, if you inquire, that the real architect was a late eminent professor of geology, the truth probably being that this professor just sketched out the arrangement of the courts and chambers. Having done this, the public set him down as the author of the whole structure, from foundation to finish. One can hardly help suspecting that what happens now often happened in the Middle Ages. When we read that this bishop or that abbot was the architect of his church or cathedral, the scepticism which comes from experience sees him painfully drawing on parchment a plan of his nave and choir, his aisles and transepts. That done, and the dimensions settled, it discerns him cheerfully turning over the rest of the design—that is, about 95 per cent. of the whole—to some master-mason and his craftsmen. It was they who invested the scheme with artistic merit. It was they who made it possible as a piece of construction; and it may be they would often have made it better than they did if they had not been hampered by the great man's ground-plan at the outset.

It does not take much to make a man suppose himself an architect. Look at the case of the Faddleton Sunday-school. The site was secured, and plans were about to be obtained. Suddenly it dawned on a good man—a member of the building committee

—that he himself was by descent an architect, and was capable of producing them. His father, whom he lost in his infancy, had been a land surveyor, and, amongst other things, had left him a measuring chain and a two-foot rule. He hunted them up. The chain, though imposing in aspect, did not seem to have any vital relation to the business in hand; but the two-foot rule was invaluable. By its aid he drew out a ground plan of the building; it was just such a plan as anybody would be likely to draw who had never drawn one before—namely, a plain oblong, without classrooms, without porches, without offices. Wide enough to touch the adjacent buildings, it would have required on each side of it a lead gutter about 70ft. long, supplying a prospect of useful work for teachers and children in shovelling away the snow after every storm. He was delighted with his feat, and his fellow-committeemen were equally delighted. They thought, as many people who would be indignant at being called ill-educated still think, that all the drawings a building requires are a ground plan and a view of the outside; consequently they considered that he had made exactly half of them, and that the architect they might select could not in conscience expect more than half his commission. Hope, in this case, told them a flattering tale. Several things were clear to all the professional men they interviewed. First it was clear that there would be more trouble in making the sections and elevations fit the amateur's plan than in working out a new scheme altogether. Secondly, it was obvious that if this plan was built from, all its faults would be laid on the architect. And thirdly, it was so extremely defective that no architect would take any responsibility with regard to it. The committee, with sighs, and almost with tears, had to give it up; but they would tell you to this day that they did so in consequence of professional jealousy. They do not realise that a man is not necessarily an architect because his father was a land surveyor.

The gentleman amateur stands on a higher level. He has some acquaintance with architecture, at least from the outer side. He has travelled about and cultivated his taste, and does really, to some extent, know good from bad. His criticisms are often sound; it is only his suggestions that are troublesome. He has seen something abroad which he remembers with pleasure; he wants to do something like it at home, for a different purpose, in a different climate, with different materials. He is disappointed if his architect explains that for these reasons the thing may prove a failure; he is still more disappointed if he is not cautioned, and it turns out ill. Or, again, he imagines a design for himself which he would like to have built, and he tries to explain it and get it put on paper. To work out one's own half-grasped conceptions is no easy matter, and to seize upon those of another person, and embody them in brick and stone, is more than can be expected from human intelligence. Here and there, perhaps, an idea is taken hold of and used; but in all probability it jars with the work by which the designer has to supplement it, and if this does not happen, and if he takes up the conception with all the goodwill in the world, he cannot carry it out with the life and spirit which he would have put into some thought of his own. It turns out tame and flat, if not full of incongruities, and, naturally enough, there is disappointment again.

When the amateur is going to build a house, he is fond of sketching out its plan. And herein he is doing a useful thing, if he will let this plan merely serve as a statement of his requirements. It will give his architect, in that case, a great deal of valuable information. It will show what sort of a hall, what sort of a dining-room and drawing-

room and library the client wishes for, and in what sort of position he would prefer to put these and the other apartments. Here and there it may contain suggestive points, worth noting and incorporating into the future structure. The common mistake is that of handing it to the architect as a scheme to be exactly followed. The arrangement may, or may not, be convenient; but there is a great deal to be thought about in making a ground-plan, besides its convenience. It may be convenient, and yet very costly; it may be convenient, and yet difficult to roof without lead flats and lead gutters; it may be convenient, and yet badly lighted or structurally weak, or objectionable in fifty other ways. If these things are so, the plan ought to be modified; but to get it modified may require some tact. The most beautiful thing a man sees is, according to an Eastern proverb, the work of his own hands; and of all his works, the best-beloved is usually the earliest and most imperfect. The pupil's first design!—how admirable it seems to him!—what visions of loveliness he beholds in every line and curve! The more designs he makes, the less satisfied he feels with them; and at last, when praise is coming in from all quarters, nothing would please him so much as to see his best building burnt down, and to know that he would be allowed to put it up again with improvements. The amateur is in the position of the pupil. Unless he has worked out a great many plans before, he will be tempted to think his plan absolutely right; and it will not do to let him find out his mistake by carrying it into execution. "If you knew it would not answer, why did you not tell me at the beginning?" will then be his question. The architect will get all the blame if it fails, though the owner, perhaps, would have appropriated all the merit had it succeeded.

There are amateurs of many sorts, but we will only refer now to those of the fussy sort. They are often fair and just in intention, but troublesome beyond human endurance. A good man of this class, who will now trouble no architect any more, used to live about twenty miles from London. He had much landed property, and lived in a larger house than he required. In this he made constant alterations, bit by bit. His architect lived in daily fear of hearing from him. At one moment he would write, "Pray come down by the 1.30 train to-morrow, as I am thinking of altering the library window from eight panes to either four or six, and I wish to have your immediate advice about it." Next week he would send a note to say that he wanted to consult on the spot as to the best place for the scraper; and soon afterwards, the new panel which had been put into the back-door would require instant examination, as it exhibited most alarming signs of shrinking. All this would be very well, if an architect received for his journeys the same fees as a fashionable doctor. Under the actual conditions, it is not at all well. Details, of course, must be looked after; but when they have to be looked after, one by one, in this way, some other mode of payment than that by commission becomes an urgent necessity. In this case, the architect did his best—not merely for his own credit, but for the sake of obliging a client who was in many ways deserving of respect. He did not, however, reap the reward he might have looked for. The client ended by pulling down his large house, and building a smaller on the same site; but he called in a fresh architect for the purpose. The moral is, that there is no satisfying the fussy type of amateur, and that the best course to adopt is to keep clear of him altogether.

ART IN IRON ROOFS.

SINCE Hodgkinson and Fairbairn first essayed in iron, the design and development of the iron roof have made considerable

strides in this country, notwithstanding the strong prejudices which iron has had to encounter from the profession. These prejudices were mainly based on objections to the employment of a new and untried material, and the abandonment of timber, so long associated with the noblest examples of constructive skill. With the experimental knowledge derived from important engineering works, the former of these objections has been gradually removed, perhaps not entirely, but sufficiently to give architects confidence for the future. The latter objection—the dislike to give up timber—however, is still potent, for we find that even for wide roofs timber is preferred whenever the building aims to be something of a more ornamental kind than a drill-hall or a railway-station. The fact is, simply, that there is more adaptation in a roof of wood. It can be designed with reference to architectural effect better than one of iron; it is more substantial in appearance as a visible roof, and for decorative purposes it is decidedly superior. In a word, the architect can get more out of it. An iron roof must be a truss of some sort, and the principle of its design must be that of resisting tension mainly with the smallest members compatible. We cannot give to them the substance of wood, on account of increased weight. For instance, a principal or a wrought-iron tie-rod of large section would be heavy and uneconomical in the extreme, without any compensating advantage whatever. How iron might have been treated if our roofs could be cast in sections and bolted together like the cast-iron ribs of an arched bridge one can only conjecture. For example, we might have an iron truss of two halves, each of cast iron and bolted together, that would be sufficiently strong against all risks, and substantial in appearance, were it not for the weight of iron. Take two unequal-sided triangular frames of cast iron, and putting together the shortest sides, bolt them together to form a roof-truss. The open spaces could be filled with ornamental ironwork, either cast or wrought. We might imagine the old hammer-beam and ribbed types of roof, like those over Westminster Hall, Hampton Court, Crosby, and Eltham halls, cast in sections and erected. They would at least be stronger and more durable than timber, but their weight would be objectionable. For structures of small span, cast iron might be used, but successful precedents are scarce.

Lately there has been a growing desire to adopt iron roofs over large halls and lecture-rooms in buildings of an architectural character. Many of the designs now made for municipal buildings in which large central halls are provided have iron roofs to support the outer covering, with plaster or other ceilings underneath. For this purpose the value of iron construction cannot be questioned; the roof can be made lighter and of flatter pitch if need be, to say nothing of its greater durability. In many of our public libraries the reading-room and reference-library are covered by iron roofs, and in large congregational buildings it has been used, but we cannot say with much artistic success. In many of these buildings, however, the iron roof forms the outer covering, and does not show internally. No attempt is made to represent it otherwise than as a plain wrought-iron piece of construction, so that in this manner the engineer, rather than the architect, is consulted in its design.

The history of iron roofs of wide span would form an interesting digression from our present remarks, and it would show how much, or perhaps we ought to say how little, has been accomplished to make the wrought-iron roof architectural. One of the first wide-span roofs erected was that at the Lime-street Station, Liverpool, of the London and North-Western Railway. It was put up

in 1849, forty-three years ago. The span is 153ft. 6in. This roof is of the arched or bow-string class, with radiating struts from the tie-rod; the trusses rest on cast-iron columns 21ft. apart, and to the underside of girder the height is 56ft. The bow-string truss has developed into many forms to be met with over some of our great railway stations, as those of Birmingham (New-street Station), the Victoria, London Bridge, and Charing Cross. The tie-rod truss is well suited for the large spans of railway stations and industrial halls, and the iron roofs over some of the new buildings for the forthcoming Columbian Exhibition at Chicago show the progress that has been made in iron construction of this class. Thus, the Industrial and Liberal Arts building has an iron roof of 368ft. span, it being erected over 200ft. high, and on columns 50ft. between centres. For spaces of large area probably no other class of truss is more suited, and the angle braces, which come down below the springing level of the principals and connect the line of columns, cutting off the angle between the latter and the tie-rod, are great improvements to the appearance of the roof, and add materially to its strength and resistance to wind lifting. Another class of truss is that formed of arched ribs without ties, which are prevented spreading by the ribs being brought down low, or nearly to the ground, as in that of St. Pancras Station, which has the tie underground, and that of the Olympia, where the horizontal thrust is provided for by one part of the arched rib being continued vertically down the columns and the other part branching off to form the gallery roof. Considerable architectural effect may be obtained by arched ribs of this kind, either open and latticed or solid. The arched ribs of the Agricultural Hall, Islington, exhibit a roof of this construction. Of the open braced kind, we must name the steel arched roof of the Electricity Building at the Columbian Exhibition, the inner member of the arch springing from the floor. The truss or tie-rod class of structure is obviously less suited to an architectural design; it has an unrestful look about it, and all its stability depends on the fragile tie-rod and the connecting-rods and struts. If we can imagine a truss of the bowstring type filled up with a solid pierced web of crescent shape, a more stable form of roof would be the result, at least to the eye, but the construction would be less economical, as lightness would be sacrificed. One of the greatest roofs of the arched rib class ever constructed was probably that of the roof over the machinery hall at the Paris Exhibition of 1889, the clear span of which was 377ft., the ribs being made of steel, hinged at their bearings on the ground level and at the crown. These pivots enabled the roof to accommodate itself by expansion and contraction to changes of temperature. The chief weakness of all truss forms artistically considered is that they spring abruptly from their walls or supports, whereas the arched rib may be brought down below the rafter springing level, the spaces between the curved ribs and the rafters, or the spandrels and crown, being open for some kind of pierced work or ornamental filling.

Having shown briefly the two principal kinds of iron roof, we may now inquire why it is they have failed to become architectural features. One of the main causes is no doubt to be found in the fact that this class of structure is still exclusively in the hands of manufacturers, who are required to produce something economical. Whenever an iron roof has been erected, the question of economy has been uppermost. It is generally a cheap mode of roofing a large space that is thought of, such as a railway station, a huge exhibition building, or hall. We have another reason why the iron

roof has not become a favoured object of the architect's attention, namely, that it is generally concealed by a lower ceiling in architectural buildings. Except in large structures, the iron roof has generally been the outer covering, and therefore not visible below. For this purpose the ordinary forms of truss have been used, and little opportunity has been given to design an iron truss, or to consider it in the same category as the wooden one. Until the iron truss is made a visible part of the interior of a building, architects will be content to allow the design of it to be left to the engineer. A few instances of iron roofs over large public halls and Nonconformist buildings may be cited; but owing to the causes we have pointed out, they have not come up to the artistic standard of the old wooden roof. The ribs look weak, and spring badly from the walls or the spandrel, and the ornament introduced of cast iron is of an inferior order. The great point to be aimed at is to bring down the truss below the springing or wall-plate level, to consider the ironwork as part of the structure. If architects would regard the iron roof as they do the timber one, and endeavour to divest their minds of the ordinary engineer's types of tie-rods and tension members, introducing cast iron in parts subjected to simple compression, we may one day see a more artistic discernment of iron as a material for the purpose. For churches, the timber construction will continue to hold its place till a more substantial class of iron roof is to be found than that which has been adapted over structures of a more or less temporary character, or which have so little permanence expressed in their design.

APPLIED ARCHITECTURE.

WHEN so many specialised forms of construction engage the attention of the architect, it is necessary that the educational facilities afforded to students should be abreast of the time. The antique models, examples of ancient and modern architecture, diagrams and apparatus, found in our public institutions and colleges in which architecture is taught are no doubt valuable means of instruction in the hands of competent professors who are engaged in teaching the elementary principles of art, but they fall very short of those requirements which now often tax the mind of the practising architect in those special "lines" of construction which may be regarded as special branches. It is for this reason we have pleasure in drawing attention to the announcement that the authorities of King's College, under the direction of Professor Banister Fletcher, have established a museum replete with models, drawings, casts, specimens of various kinds, admirably adapted to the requirements of architectural students. This collection has been in formation during the last two years, and includes examples from Italy, France, and the Continent generally. Visits by Prof. Banister Fletcher have been made for this purpose. The photographic illustrations in the corridor include interior views of the Pantheon, Rome; St. Clement, Rome; Basilica of St. Apollinare in Classe; Mausoleum di Galla Placidia, with its simple vault; San Miniato, Florence; Pisa and Siena Cathedrals. Fine examples of Renaissance are given in the unique doorway of the Palazzo Vecchio, Florence, and a stone mantel-piece of the Bargello Museum in the same city; but it would be unnecessary to particularise. Every important ancient and modern style is represented, Egyptian, Greek, Roman, Romanesque, Byzantine, Italian, French, German, and Belgian Gothics. The English styles are equally well represented in a good selection of typical illustrations and plaster casts. These illustrations are mainly from the col-

lection of Professor Banister Fletcher. The museum contains specimens of all the chief woods and stones; of the latter we notice several blocks of the several varieties of stones quarried by the Bath Stone Firms, samples of terracotta and pressed-facing bricks supplied by Mr. J. C. Edwards, of Ruabon, models of parquetry floors, &c. The models of roofs, trusses, framed floors, and partitions are well selected. The facilities at King's College include an architectural studio for assistants and others, and classes for constructional drawing and quantities, in addition to the day and evening classes.

The many admirable textbooks and technical manuals now published on every branch of the building trade ought to make our rising architects very competent in all the technical parts of their profession, if, indeed, such means of instruction can do so. In future we may expect our young architect to be skilful in technical crafts; we may expect him to be able to use the tools of the carpenter and joiner, to "true-up," square, gauge, set out, and chisel any piece of wood; to be able to make a rectangular or octagonal prism or cylinder of wood, to dovetail, mortise, and make boxes and drawers, and to frame an ordinary door. At least we may expect him to know how to set about these operations, without going so far as to say that the manual training is absolutely necessary for the architect to go through. No doubt he is all the better equipped for the duties of his profession in making working drawings if he is so qualified, though we cannot fully endorse the proposition that a manual knowledge of the trades is absolutely necessary for an architect. As an exercise for the training of the eye, these operations are of value. For instance, the practice of "trueing-up" a piece of wood with a jack-plane, taking off the rough parts and testing by means of a try-square and winding sticks; shaping up models of moulded bars like the spoke of a wheel, must have a beneficial effect and become an education to the eye. Models and diagrams of these objects ought to be in every technical museum, as well as those of the advanced stages of framed work, as roof trusses, staircases, and handrailing.

But there are other and higher object lessons to be kept in view. Technical instruction should be applicative to every kind of building. The operations of carpentry and joinery, applicable to matters like roofs, partitions, doors, and staircases are elementary. We want instruction in planning theatres, technical school, libraries and classrooms, hospitals, baths, public libraries, and many equally specific kinds of buildings, about which there is very little published information extant. Such details as have been given by Mr. Ernest A. E. Woodrow, A.R.I.B.A., on theatres in our pages are of value. What, for instance, should be the rule for arranging and adjusting the seats to the isacoustic curve, so that every spectator may see the stage; the mode of planning the pit and stalls, the dress circle, second circle, and gallery so as to obtain desirable sight lines, are points that ought to be learned by every architect; but, as a matter of fact, the question is one left to experts in theatre construction. So also every student should be taught how a classroom and a laboratory should be arranged so as to afford the proper light, and how the benches and fittings ought to be designed. There should be some accepted principles of these points, which ought to be known as a part of the grammar of planning. Of the other special buildings we have named, the knowledge to be learned is equally certain and specific, and good models of the requirements and fittings should be found in every architectural school or museum. Hitherto we have had no specialisation of architecture; all has been too general (applicable to every building alike) to be of much value to an architect who is called upon to design any

of the structures we have named. The old régime, while it made skilled constructors and builders, taught nothing of any particular arrangement. A certain consequence has followed—viz., that specialists have had it all their own way in theatre building, hospital and technical-school construction, &c., and even in church building the architect who has made himself a master of ritual requirements is generally employed to design the largest churches. These gentlemen have monopolised certain branches in consequence. But there are two stronger objections to be urged against specialist architects: first, they have not that knowledge of art which is necessary to produce the highest results artistically. Thus, a designer of factory buildings, workshops, breweries, and the like may inflict much pain on the sensitive artist, as he frequently does as a matter of fact. Again, while a class of buildings is in the hands of a few experts, perhaps only two or three, improvements in design are less likely to be sought for, as the specialist has a great aversion to make a new track or to break through old traditions. On the other hand, when the whole profession are generally learned in the requirements, many artistic minds are directed to the problem, and there is greater chance of competition and improvement. A clique of architects who are making a fortune in one branch are not likely to impart to others the elementary principles and data. We have a superabundance of books, models, and illustrations of the Classical and Gothic periods, but scarcely any explaining the many recent applications of architecture to commercial, educational, hygienic, and technical pursuits and requirements. Construction in iron, timber, brick, and other materials has been fully exemplified, but if we want to know anything of fittings for certain purposes, we can only obtain the information by examining buildings in which they are provided, or by consulting specialists or manufacturers.

IRON ARCHES OF LARGE SPAN.—II.

CAST IRON.

THE value of the "inertia" of any particular cross-section, which very materially depends upon its relative proportions, having once become recognised, led, before long, to the adoption of a different form for every description of cast and also wrought-iron beams. The modern cross-section, both in England and the Continent, for cast-iron arched ribs, is that of the double equal-flanged system, of which we shall adduce, subsequently, some practical examples. In order, however, to point out that an intermediate form between the plank-on-edge section, described in our first article on this subject, and the present type in use was formerly introduced, we give an illustration of it in Fig. 2.



Fig. 3.

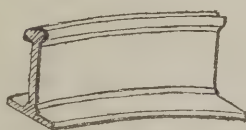


Fig. 2.

There is also another reason for drawing attention to this form of cross-section, which is well worthy of consideration, as it involves a question which has been discussed by many eminent authorities, who are by no means *d'accord* respecting its solution.

The section shown in Fig. 2 is that of the arched rib of the "Standish Bridge," which, though it varies in depth, yet retains the general form given in our illustration. The depth at the crown of the arch is 1ft. 6in., and except that the breadth of the lower flange is in point of magnitude largely out of proportion, the shape strongly resembles an ordinary contractor's or Vignoles' single-flanged rail. The dimensions of the lower flange are 9in. by 1½in., while the breadth of the head or top (for it cannot properly

be termed a flange) is 3in., and the depth or thickness 2in. The thickness of the middle part or rib is 1½in., which is not more than what is about sufficient for it to do its duty in maintaining the top and bottom parts at their respective distances, and so preserving the stiffness of the whole cross-section. In estimating the strength or the moment of resistance of this form, it would be advisable to neglect the area of the middle part, and so err, if at all, on the safe side.

An inspection of Fig. 2 indicates that while the shape of the cross-section is not that usually adopted for cast-iron arched ribs, neither is it the proper form for a cast-iron beam or girder. The correct relative proportions for the respective areas of the top and bottom flanges of a cast-iron girder are as one to six, and not as one to two and a quarter, which latter ratios are those of the head and lower flange of the section in Fig. 2. It would appear, therefore, as if this section were designed to act, partly, although imperfectly, both as an arched rib exposed to solely a compressive strain, and also as a girder, subjected to a strain of a transverse character. Although an arched rib, whether of cast or wrought iron, is usually regarded as being acted upon by a compressive strain alone, yet—and this is the question we drew attention to—under certain conditions of loading it is stated that it has to behave similarly to a horizontal girder of the same span. In what exact proportions it has to discharge this double duty has not been satisfactorily determined, although there is very little doubt that the girder principle, if it does exist in this type of construction, plays a very subordinate part in comparison with that of the arch.

Another practical example of flanges of unequal area is shown in Fig. 3, which represents a cross-section of the cast-iron arched rib of the bridge over the Thames at Barnes. The flanges are 30sq.in. and 16sq.in. respectively, or in the proportion nearly of two to one. They are not of the same thickness either, the lower being 3in. and the upper 2in. thick, which latter dimension is also the thickness of the middle part or web. Independently of the part played by the breadth of the flanges with respect to the "inertia," or moment of resistance of the cross-section, as already pointed out, the stiffness of the rib is greatly augmented, by a proper proportion being maintained between the values of b and d . It is evident that in unequally double-flanged sections, similar to that in Figs. 2 and 3, the neutral axis and the centre of gravity do not pass through the centre of the cross-section—that is, that the equation $x = \frac{d}{2}$ no longer holds. It is obvious

that the position of the centre of gravity will be shifted nearer the flange, which has the greatest moment of resistance, which is, *ceteris paribus*, proportional to the sectional area. In order to obtain the position of the centre of gravity for a

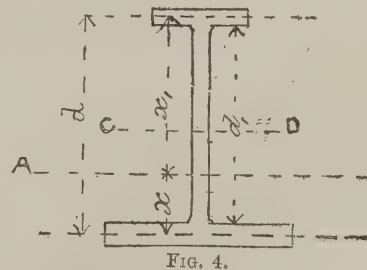


Fig. 4.

similarly shaped figure, let Fig. 4 represent an unequally doubled flanged section, and assuming the thickness of the flanges to be small in comparison with the depth, as it usually is in practice, and also that the vertical rib is neglected, let AB be the position of the line sought for. Put d for the depth between the centres of the upper and lower flanges, and let x and x_1 be the respective distances from those centres on each side of the line AB . Make $a =$ area of upper flange, and a_1 that of the lower flange, and $A =$ the total area $= a + a_1$. Multiplying these values by their leverage, we obtain for their moments $a \times x_1 = a_1 \times x$. Substituting for x_1 its equivalent $(d - x)$, we have $x = \frac{a \times d}{A}$. If d_1 be the depth of the vertical rib, its centre of gravity will be obviously in the line $CD = \frac{d_1}{2}$; and by similar reasoning, a new position for AB may be

found for the entire section. The practical corollary to be deduced from these investigations is, that however we may shift the position of the neutral axis or centre of gravity, the sum total of the results will depend upon the value of d , the great factor in the strength of all beams and girders, no matter what may be the form of their particular cross-section.

The largest cast-iron arch ever contemplated was one over the Thames, with a span of 600ft.; and it is very possible that had the "overhang" principle for erecting bridges been as well recognised and practised then as it is now, the project might have been carried out. As it is, arches of steel, with a span of 550ft., have been built in more than one instance with perfect success. It is a matter of professional history that, owing to the impossibility of erecting centring at the Menai Straits, it was proposed to construct a bridge of two cast-iron arches, each 350ft. in span, with a rise of 50ft. The design for the intended structure was an exceedingly handsome one, and would have been a great improvement upon the present tubular type of bridge. The arches in question would not have consisted of separate segments of cast-iron ribs, but of voussoirs of that metal, built up successively one by one on opposite sides of a common pier, and held together by strong horizontal tie-bolts. Had the arches been composed of segments of an ordinary rib, there is no reason why the same process would not have been equally available for maintaining the equilibrium of the two semi-arches until the centre length was keyed in. It was, no doubt, the stone arch, with its numerous voussoirs or ring-pens, that suggested the same mode of construction with the more modern material. Cast-iron voussoirs was used in the construction of Sunderland Bridge over the river Wear, and were simply of the ordinary shape, measuring 5ft. in depth and 2ft. on the line of the extrados. While this bridge was in course of erection, six of these voussoirs or blocks were held in place by iron tie-bars. The span of this example of arch construction is 236ft., which is within 4ft. of that of Southwark-bridge. In the proposed structure across the Menai Straits the voussoirs were intended to be hollow, and measure 9ft. in depth by 4ft. on the extradosal line. Although, for reasons that are well known, this cantilever or bracket-arch design was abandoned, yet the opinion prevailed that the principle was susceptible of application upon a much more extended scale than was necessary for the large spans of the Britannia Bridge.

ARCHITECTURE: AN ART, A SCIENCE, AND A PROFESSION.*

FOR clearness' sake, I will at starting define exactly the objects I have in view in this address. First, then, we will consider what is an art; we will examine the nature of an architect's work, and I will endeavour to show that architecture is justly an art. We will then consider what is a science, and will see in what respects architecture is a science. We will thirdly consider a profession, and I will show you that the serious exercise of the art and science of architecture constitutes a profession. You will, perhaps, by this time see that the drift of the title lies in the one short word, *and*. I substitute for an *or*, which insinuates doubts that I call mistaken, the other conjunction which is meant to imply that there is no doubt at all. There will only be time at the close to allude in the briefest manner to your preparation for the exercise of this profession by the pursuit of such studies as form the occasion of our meeting here this evening, and in other ways.

An art has been defined as "the power of doing something not taught by nature and instinct." Obviously, no natural gift, no skill gained unconsciously and in a natural way, is an art. The word *arts* in the plural has an extremely extended significance, and may be used to cover all the kinds of learning and knowledge that are called liberal pursuits. The word *art*, on the other hand, has often a narrow meaning, and is limited to the sort of skill which is directed towards objects of beauty. More correctly, this sort of art is called fine art, but we usually now refer to painting, sculpture, music, architecture, and the related pursuits as

pre-eminently the arts. This, however, is not strictly accurate. When we talk of an art it may or may not imply the possession and use of learning and knowledge, and it may or may not imply the exercise of trained and cultivated taste and the pursuit of beauty; but it always means a skill that does not come by nature. Though there be a distinction between an art as thus described, and a fine art demanding cultivated taste as well as skill, the relation between the two is still very intimate; the links, for example, which connect the art of the sculptor with that of the jeweller, or even the potter, are close ones. There must be the same highly-trained manual skill, and the same intimate knowledge of the materials used. The same clear and definite perception of the aim to be attained is needed for success in either. There is, of course, between most of the industrial arts, taken as a whole, and the fine arts, a difference which is conspicuous enough, but it is not always recognised that the whole of the arts are connected together to a remarkable degree by the fact that trained skill is in each case indispensable to those who would pursue them, and that there is not often a hard-and-fast boundary-line distinguishing the one from the other. He that pursues an industrial art is called an artisan; he that pursues a fine art is called an artist; but many an artisan is an artist as well. Is architecture an art? And, if so, is it a merely industrial art? Is it one of those nobler arts, like surgery, which stand out prominently as dignified, and yet may have nothing to do with taste and beauty, or is it a fine art, like the pursuits of the musician or the painter? Architecture obviously does not resemble arts such as are generally called industrial. Architecture is not an industry. It, however, has much in common with what I have described as the nobler arts; it has also much in it of the fine arts. Let us for a moment consider how much, and let us, with this object, examine the nature of an architect's work. The architect has to exercise trained skill at every step, and he depends upon that skill for his success. It is not a natural gift which enables him to grasp the requirements in the case of any intended building: this, which must be done as the first step, is only possible after very considerable experience and training; yet, if it be not clear to the architect what the requirements are which he has to provide for, his work is compromised at the start. Again, the power of grasping the nature of the site which a building is to occupy—selecting the exact position, and blending or contrasting the intended building with its surroundings, is an acquired skill; in short, an art in itself. Again, the skill which can rapidly and surely contrive and plan a scheme that will meet the requirements when the latter are clearly understood, and will fit the site, is an acquired aptitude, and one that needs cultivation and constant practice to develop it, and without which the architect is unable to produce a building fit for its purpose. When the architect proceeds to design his building, he begins by planning it—that is to say, designing and arranging the shape and size of the floor or floors on which the affairs which the building is for can be most conveniently transacted, together with the walls to inclose them, the openings for light and access, and, in any complicated plan, the communications. While this is being done, however, other considerations must be present to the mind. The shape or shapes given to the building must be such as can receive a suitable roof, and such that out of them shall naturally grow an exterior and interiors with good architectural character. It is impossible to exaggerate the importance of the plan as a factor in the design, and only by trained skill can the architect embrace these various and often conflicting needs at the same time, and combine and contrast, change and recast one part after another till he has achieved that triumph of technical skill—a good plan. We have said that the appearance of the building has to be borne in mind from the first, and as the planning proceeds, the designing of the exterior and interior must be taken up and proceeded with; and here a skill and a taste bred only of cultivated training, practice, study, effort, and some spark of genius, or, at least, some treasure of talent, is called for. With main forms shapely, well-proportioned, harmonious where a quiet effect is right, or contrasted where brilliancy is needed; with features each in its place, and

each itself good; and with mouldings, enrichments, ornaments, and colour, each studied and each characteristic—the architect must gradually build upon paper a series of elevations and sections which his skill enables him to make, such that if carried out the building shall have beauty, and such dignity, or grace, or other quality as best fits its nature and its site. Another claim on that skilled capacity which makes up the art of the architect, and one, perhaps, as difficult to comply with as any, is made by the financial question. Rarely has the architect *carte blanche*; rather, as a rule, he is closely limited by a fixed amount to be expended, which may not be adequate to enable his ideas to be carried out. In most cases it is essential to success that strict economy be observed, by which I do not mean mere cheapness, but a vigilant eye to keep out everything in the least superfluous, and a careful adjustment of the entire project to the funds at the architect's disposal. In this respect our work is placed under conditions with which the painter has nothing to do, but which are not dissimilar to those governing the sculptor's work. They press often very heavily on the architect, and yet ability to conform to them is one of the parts of our art most imperatively necessary. To put the case in the fewest words, the architect is spending someone else's money. He is bound to spend it like a careful trustee. He is expected to be able at a very early stage to foresee what the cost of carrying out his design when it has been matured will be, and the success of the undertaking not a little rests upon his success in doing so. Another peculiarity inseparable from the position of the architect, and one of the difficulties besetting the exercise of his art, is that he has to build through others. He cannot execute with his own hands the works which he designs and produces. An army of carpenters and joiners, masons, and bricklayers are at work erecting the building, each not unlikely to fall into mistakes and mar as well as make. The architect must supply such plans, such specifications, and such supervision that it shall be easier to go right than to go wrong, and that the many hands engaged may work to one end. I quite admit that from one point of view the modern system of management by which in most parts of England one contractor directs many trades, diminishes the difficulty which I have described compared with what it was at the beginning of the century; but if it makes it easier to direct a miscellaneous body of operatives, this practice introduces a new and a not less serious possibility of difficulty of a different sort. In short, the dealing with men, with contractors, foremen, artisans, clerks of works, and last, but not least, with employers, committees, and official persons, is a part of his art in which the architect requires to be skilled. Fortunately a good routine exists, and scrupulous attention to it will enable a reasonably sagacious man to avoid many of the difficulties; but even to gain a familiarity with that routine is part of the requisite training. One of the most interesting, as well as the most important, branches of an architect's work, is his supervision of his building during its erection. The methods pursued at the present day require a great deal of foresight to be exerted. We build our buildings on paper complete, long before we build them in bricks and mortar; but when the paper work is done, the exercise of the architect's skill is only begun. The superintendence of a work consists in part in watching the materials, and the putting of them together to see that the one is sound and the other workmanlike; but it means also watching the architectural quality of the work, as it gradually emerges from the ground and takes shape, in order to see that that shape is what it ought to be, and, within limits, to better it. A skilled and vigilant architect can do much to perfect the quality of his executed work by minute attention to details as they go on. Beyond this comes the question of improvements. Few minds cease working at any stage short of the end of an undertaking; and the architect or his employer can often see how to modify for the better a building which is in progress. This is sometimes a misfortune, as well as an advantage, and part of the architect's art is to know when not to change, and when he had better change his work as it goes on. Nothing connected with building is more full of risk; and a most unfortunate quality of mind is that fluctuating taste which before a work is well begun desires to change it in important particulars. Over-supervision is also a defect, and one

* By Professor T. ROGER SMITH, F.R.I.B.A. Portions of the opening Lecture of the Session 1892-3 at University College, London, delivered last (Thursday) evening.

part, not an inconsiderable part, of the art of superintending a building is to be able to let well alone. It may be objected that in this description I have mixed up things which everyone would admit to be art with others to which some would desire to give another name. But I reply that every part of what has been just described is essential. If a building is designed and carried out without any regard to the architectural qualities which it ought to have, if it is vulgar, unpleasant, ugly, we all recognise that an essential point is missed; but if it is badly planned, or carried out defectively or profusely, the architect has equally missed an essential of success in his art. The quality which we are about to consider under the name of science must lie at the root of the art, or the result must be incomplete,—not to say imperfect.

In considering architecture as a science, let us remember that the primary and simple meaning of a science is the sum of that which is known and knowable about any given subject. There are various directions in which the architect has to accumulate knowledge, and various sources which contribute to the science of architecture. The first of these is construction. The architect must know out of what materials his building is to be made, and how to deal with them; what is necessary for stability, what for solidity, what for durability; what are the defects or the bad qualities of each material, and what is its special excellence; and how the defects are to be remedied and the good qualities utilised. He requires to know how building is done, and that in various localities and with various arrangements; and he should be abreast of all the improvements of recent years, the new materials, new modes of manufacture, and new possibilities; but while he is to be aware of what is newest, he must also be master of what long experience has established. In short, *building* is the architect's business, and, unless a knowledge of building which is at once accurate and extensive forms part of his equipment, he will do badly. This is the more important because all the noble qualities which architecture can impart to mere building grow out of sound construction. Such fine features as the arch, the dome, the vault are only pleasing because they are structurally part of the proper constituents of a building, and proclaim themselves such. When the eye, indeed, once perceives that a feature, even if richly decorated, is not structural, it loses more than half its charm. At the present day the introduction of steel and iron into buildings is the great novelty in construction, and no architect can afford to be unfamiliar with the qualities of these materials, or to be unprepared for the necessity of employing them should it arise. The extensive possibilities opened out by the use of terracotta, the various ways in which Portland cement has rendered strong and stable building more easy than before, and the many varieties of tiles obtainable, may be taken as less capital examples of modern methods which must be mastered. I spoke of various directions in which the science of architecture has been developed. Construction is one, sanitation is another. Not only should the architect be able to design and calculate his own beams and stanchions, he must also be able to arrange the drains, the water-supply, the heating, lighting, and ventilating of his buildings, and that in a manner such as to be fairly abreast of modern practice in this respect. A further branch of the knowledge for which I am pleading, and one constantly ignored, deserves mention. I refer to the transmission of sound. How often do we find a fine church in which no one can preach so as to be heard; a court of justice in which the keenest ear can hardly catch half the proceedings; a public hall where no speaker can escape an echo? Now, it is not caprice and chance which occasions these failures, though it soothes our self-esteem for us to say so when we have failed. The truth is that a certain amount of attention to what is known about sound, and of keen observation of buildings already erected, would have rendered the architects and their employers an inestimable service as showing what was likely to lead to failure, and how to avoid it. The last branches of the science of architecture to which it is necessary to direct your attention is of a different nature to the ones just alluded to. A competent knowledge of some at least of the forms used in architectural design, including under the word forms general masses, features, mouldings, and enrichments, is quite indispensable. This knowledge must be

so thorough and complete that the architect can use those forms with perfect ease and precision, and know them as familiarly as he knows the size of a brick or a flue. I said a competent knowledge of some of these forms, and probably no man has known, or can ever know, them all, nor is it necessary. Enough to enable a man to design in one style and to make the detail drawings and profiles for the building is the minimum. How much more is desirable I dare not attempt to say. Possibly the most successful designers have not gone beyond one style; at any rate, the best designs that the world has seen belong to ages when only one style was known and followed in one place. He who would limit himself to one style, however, should at least know every part of that style thoroughly; and he will be helped by that knowledge if he study others. This sort of knowledge of architectural forms and features can hardly be obtained except by measuring and drawing existing buildings themselves. A thorough, accurate, serviceable mastery of one style, such as enables an architect to deal with it as the clothing of his architectural ideas is got nowhere and nowhere except by definite study of existing work, certainly not from photographs, and only partly from drawings, engravings, or books. A knowledge of the history of the art, on the other hand, is obtainable best in the classroom and the library.

We will now try to form an idea of what is meant by a profession, and, as is not infrequently the case, we may perhaps be aided by looking back a little to the days of our forefathers, when life was less complicated than it is now. A hundred and fifty years ago four professions, and I may safely say four only, were generally recognised, though even then one other, to which I will allude directly, might be added. The Services, the Church, the Law, and Medicine are the four. If for a moment we consider what distinguishes these pursuits, we shall have made out the general idea of a profession. First, in each of them there is the idea of some special cultivated skill—in other words, the mastery of an art. The first qualification for a profession is then what is meant by the title. The professional man professes that he is master of an art—in other words, skilled in a certain pursuit. Next please note that each of these callings is pursued on behalf of some one else. The respect in which the professions are held springs from these two qualifications. A man who can do something difficult, and who can accomplish for us what we cannot do for ourselves, is more or less looked up to, and the station that he occupies is held to be honourable. Nor is this honour very seriously impaired, if at all, by the third point of a profession—namely, that it is at once the means of living and also the way of life of him who practises it. The man who does the same sort of work that a professional man does without making his living by it is discredited by the epithet "amateur," which always carries with it a kind of sense of the second-rate, and nowhere more so than when building is spoken of. It is necessary to add that in many cases the practice of a profession includes more or less of what is known as business—that is to say, of acquaintance with, and exercise of, the methods by which serious affairs involving property and money, loss and gain, should be conducted. Every pursuit by which a man seeks to make his living requires some business habits and aptitude of him; but in many professions the very nature of the work done calls for business training and talent. Think of the large pecuniary interests which an engineer has to deal with, or an actuary, or a barrister, and you will recognise that many sorts of professional men are bound to be men of business. Lastly, a profession is the mode of life of the man who practises it, as well as his means of living. If he be not, at least for a period of his life, given up to it, and absorbed in it, and devoted to it, not only is his success in it very problematical, but his claim to any distinction it can confer is doubtful. We have thus arrived at three characteristics of a profession—that it implies the mastery of an art, and of the knowledge needful for its exercise; that it is exerted on behalf of others; that sometimes it is of the nature of a business, and that it is paid. A certain precision might, perhaps, be added to our notions by some negative characteristics. It is not commerce, it is not manufacture, it is not agriculture, and it must not be trivial or mean in the objects to which it summons the professional man to

devote his life. Just as, had I gone further back, we might have come upon a period when in Europe there were but two recognised professions, the Church and the Army, so, by coming nearer to our own time, with the rapid increase in wealth, population, activity, and knowledge which the present century has witnessed, we find one calling after another conforming to the criterion given above, and so added to the list of recognised professions. For example, at least from the days of Reynolds and the establishment of the Royal Academy, a painter has been recognised as a professional man. Since the days of the elder Brunel and Smeaton, the calling of a civil engineer has become a definite profession, and now the list of professions includes literature, education, the fine arts, and not a few of the applications of science, such as the work of the electrician, the consulting chemist, the metallurgist, and many others. But before the days of the earliest recognition of scientific or even of purely artistic professions in England, we have evidence that the architect was a recognised professional man. All that we know about the career and standing of Inigo Jones, of Sir Christopher Wren, of Sir John Vanbrugh, and their colleagues, seems to show that they must have held a position of the same sort as was accorded to the physician or the highly-placed clergyman of the same date, and certainly that they worked as a professional man does now. So that I am disposed to claim for architecture that in England it was the very earliest profession (next to the famous four) to receive general recognition. However that may be, architecture as practised, and as you will have to practise it, is a profession with all the marks of one. That it includes the mastery of an art, and the possession of the knowledge necessary to the exercise of that art, I have endeavoured to show. It is exercised on behalf of a client; it is exercised as the pursuit of a lifetime and as a means of living. It does not relate to mean or unimportant things, and it is not commercial, or agricultural, or manufacturing; but it does require business habits and an aptitude for transacting affairs. If, then, you are to become architects you are to embrace architecture as the one chief work of your lives; and to fit yourselves for the practice of architecture you are to master alike the art, the science, and the profession. And on no other terms can architecture be done, because architecture is building, and building, though no mystery, involves so much that is technical in its artistic, its scientific, and even its business aspect, that in no other way than by becoming a professional architect, and devoting the time and energy which the profession claims, and attaining the skill and acquiring the knowledge which the profession demands, can you hope to execute even an approach to good architectural work.

I conclude by a few words devoted to showing how you are to attain your aim. First—for the practical part of the art, using that phrase to signify chiefly skill and experience and business aptitude, you must look to the practice of the offices where you work as pupils or assistants. Architecture is a very practical profession, and it is of no use to expect that you can learn how to conduct it by attending classes or reading books, or in any other way than by taking as large a share as you can in the work of some office, and watching keenly and observantly all that goes on there. In your office-life nothing is too insignificant or apparently trivial to be unworthy your notice. At the same time, your wise course is to do your very utmost to qualify yourselves for the more difficult parts of the work. Always welcome a difficulty. If a hard master, it is an invaluable one. Beyond this there is the science of architecture, of which you can learn little in an office, but much in classes and from books. And in acquiring the science always, from the first, give prominence to that side of it which has to do with architecture as a fine art. Begin by learning to draw, and to draw well, and then exercise yourselves continuously in drawing architectural objects and other objects partly from other drawings, but as far as possible from existing buildings and from plaster casts, and you will gradually acquire that sort of knowledge and that sort of skill which are at once the most valuable and the most difficult. Early try to get a mastery of perspective, and keep up and extend any skill you have in drawing the figure and in landscape. In addition to this knowledge of forms, which is largely to

be learned by the use of the pencil, gain a knowledge of construction, of materials, and putting them together, and of all the scientific and practical subjects which bear upon your future career. In this, of course, classes, lectures, and books are indispensable, but a good deal can be learned by an observant man from the working and other drawings in progress in the office where he is employed, and more, and that of the most valuable description, on the scaffold or in the workshop. Every student should learn also the history of architecture. As students become familiar with the way in which buildings are shown geometrically, it is very desirable for them to try their hand at designing—i.e., putting together the materials of an artistic and practical sort which they have begun to accumulate in their memory. In this way the rudiments of the highest part of architectural art—namely, architectural fine art, are begun to be mastered. The most valuable school for the study of this, the highest part of architecture, is, beyond doubt, the study of existing buildings. I take it for granted that any student now seriously proposing to become an architect will set before him the passing of the examinations established by the Institute as part of the career which, as a beginner, he must look forward to. Remember that these and the certificates they earn, like all examinations and honorary distinctions, are valuable as means—not as ends. They set before you objects of study. They supply a means of testing what progress you have made, and they supply what is often invaluable—a stimulus; but the object of a student of architecture is to make himself an architect, and that object is not necessarily attained when the first, or the second, or the final examination is passed; nor is it wise to regulate your studies only by the question of whether they will or will not count for marks at Conduit-street. It may not be out of place to point out shortly what subjects can be studied in this college. The history of architecture, looked at as a fine art, forms the subject of one of my two principal courses. Materials and construction form the subject of another course of my lectures, and here each important building material is taken up in turn, its qualities, excellences, and defects are set forth, and the use to be made of it in building is explained. A third course, on the practice of architecture as a profession, touches on the routine of building operations, the laws relating to building, and similar matters as to which an architect should be informed. We have now established, in this college, at the expense of the Carpenters' Company, two evening classes for drawing—one for architectural drawing, and the other for the drawing of building construction—and these, I hope, as they become generally known, will be of great service to many students, for they are calculated both to afford knowledge and to give practice in draughtsmanship. They are under the direct care of two extremely competent gentlemen, as well as under my own general supervision, and the City Company, which has established them, has enabled us to make the fees extremely moderate. These classes all meet at hours calculated to suit the convenience of students engaged in offices during the day. Various classes in this college also afford opportunities for the study of many subjects which it is well for an architect to know, such as geometry, physics, building materials, sanitary science, land surveying, and, in another branch, architectural ornament. I do not wish to conceal from you that the profession is laborious, and that its great prizes fall to very few; but I maintain that its more modest rewards are within the reach of many; and if one among you really becomes equal to the performance of some special feat of architecture, I feel sure that—if not the 19th—the coming 20th century will afford him the occasion for distinguishing himself, and adding to the adornment of his country.

VENTILATION.

MR. E. H. SHORLAND, of St. Gabriel's Works, Erskine-street, Manchester, has sent us a copy of a new illustrated catalogue of his various patented warming and ventilating appliances, which he has just published. It is in book form, and contains over 60 pages, is printed on glazed art paper in bronze ink, and is altogether got up in a first-class manner. The catalogue is divided into three sections—viz., Manchester Grates, Ventilators, and Manchester

Stoves. A novel feature is that the ventilating section, which is in the centre of the catalogue, is printed on pink toned paper (the others being on white), which separates the three sections, and makes it very easy to turn to any one of them. We notice many new designs amongst the well-known warm-air ventilating Manchester grates; these grates being made in almost any design, from the plainest to the most ornamental and costly. Those with canopies have the warm-air chamber projecting well forward over the fire, thus greatly increasing their radiating powers, and are called the new *projecting* Manchester grates. Those without canopies have the warm-air chambers also inclining forward, but not at so great an angle. In the Ventilating section, there are several new designs of both inlet and outlet ventilators, and we notice that all the exhaust roof ventilators are made of galvanised rolled steel, painted with enamel paint.

The patent warm-air ventilating Manchester stoves are shown in a variety of designs, with tiled and iron sides, and both with ascending and descending smoke flues, also single and double fronted. We specially notice the large number of hospitals throughout the country which are heated by the Manchester stoves with descending smoke flues, and the highly satisfactory opinions of their action given by eminent architects and the medical faculty.

PRICES.*—XLVIII.

(All Trade Discounts have been taken off, and Profit added.)

IRONMONGER (continued).

BOYLE'S patent Cowl or Soil-pipe, &c., Ventilators, unfixed.

No. 1 or No. 3 pattern for 2in. pipe, galvanised and painted enamel paint	each	£ s. d.
2in. ditto	1	0 11 6
3in. ditto	1	0 15 6
4in. ditto	1	0 17 0
5in. ditto	1	0 18 6
6in. ditto	1	1 2 0

6in. diameter for 2in. to 24in. pipe	each	£ s. d.
8 ditto	3	0 13 6
10 ditto	3	0 18 9
12 ditto	4	1 4 0
14 ditto	5	1 10 6

C.C. roof ventilators for 6in. pipe with round base

2in. ditto	8in. ditto	each	£ s. d.
10 ditto	10 ditto	1	1 1 0
12 ditto	12 ditto	2	2 0 0
14 ditto	14 ditto	2	2 17 0
16 ditto	16 ditto	3	3 15 0
18 ditto	18 ditto	5	5 2 0
20 ditto	20 ditto	6	6 15 0
22 ditto	22 ditto	8	8 5 0
24 ditto	24 ditto	1	4 0 0
6 with square base	8 ditto	1	1 16 0
10 ditto	10 ditto	2	2 7 0
12 ditto	12 ditto	3	3 3 0
14 ditto	14 ditto	4	4 5 0
16 ditto	16 ditto	5	5 16 0
18 ditto	18 ditto	7	7 14 0
20 ditto	20 ditto	9	9 7 0

12in. improved vertical current exhaust, strong galvanised and painted iron for 4in. to 6in. pipe

14 ditto	16 ditto	18 ditto	20 ditto	22 ditto	24 ditto	26 ditto	28 ditto	30 ditto
4in. to 7in.	5 to 8	6 to 9	7 to 10	8 to 12	9 to 13	10 to 15	12 to 18	14 to 21
ditto	ditto	ditto	ditto	ditto	ditto	ditto	ditto	ditto
11 6	2 0 0	2 16 0	3 12 0	4 8 0	5 10 0	6 10 0	8 10 0	10 18 0
14 5 0	17 0 0	19 10 0						

SWEET'S Diaphragm Ventilators, unfixed—

2in. galvanised iron	each	£ s. d.
2 1/2 ditto	ditto	0 5 9
3 ditto	ditto	0 6 9
3 1/2 ditto	ditto	0 7 6
4 ditto	ditto	0 8 4
4 1/2 ditto	ditto	0 9 6
5 ditto	ditto	0 10 6
5 1/2 ditto	ditto	0 11 6
6 ditto	ditto	0 14 0
6 1/2 ditto	ditto	0 18 0
8 ditto	ditto	1 3 0
10 ditto	ditto	1 8 0
2 copper	ditto	0 8 0
2 1/2 ditto	ditto	0 9 3
3 ditto	ditto	0 10 3
3 1/2 ditto	ditto	0 13 0
4 ditto	ditto	0 14 8
4 1/2 ditto	ditto	0 16 0
5 ditto	ditto	0 17 0
6 ditto	ditto	1 0 0
8 ditto	ditto	1 3 0
10 ditto	ditto	1 14 0

KIRK'S Ventilators for up or down draughts, unfixed—

2in. ventilator for drains	each	£ s. d.
2 1/2 ditto	ditto	0 10 0
3 ditto	ditto	0 11 6
3 1/2 ditto	ditto	0 13 0
4 ditto	ditto	0 15 0
4 1/2 ditto	ditto	0 16 6

(For larger sizes add 3s. 6d. per inch.)

BANNER'S Ventilators, unfixed—	£ s. d.
2in. fixed cowl, No. 1	each 0 16 9
2 1/2 ditto, or to rotate	ditto 1 2 6
3 ditto ditto	ditto 1 8 0
4 ditto ditto	ditto 1 16 0
6 ditto ditto	ditto 2 12 0
8 ditto ditto	ditto 3 18 0
10 ditto ditto	ditto 4 19 0
12 ditto ditto	ditto 6 12 0
14 ditto ditto	ditto 8 16 0
16 ditto ditto	ditto 11 0 0
18 ditto ditto	ditto 13 15 0

INLET Valves for ventilating drains, unfixed—	£ s. d.
3in. mica flap valve for horizontal pipe	ditto 0 7 6
4 ditto ditto	ditto 0 9 0
5in. vertical pipe	ditto 0 8 6
4 ditto	ditto 0 10 6

TOBIN'S Ventilators, unfixed—	£ s. d.
6 by 3 by 18, complete	ditto 0 9 0
9 by 3 by 18 ditto	ditto 0 10 0
6 by 3 by 24 ditto	ditto 0 12 8
9 by 3 by 24 ditto	ditto 0 12 10
6 by 3 by 54 ditto	ditto 0 14 6
9 by 3 by 54 ditto	ditto 0 16 0

BUCHAN'S Exhaust, unfixed—	£ s. d.
9in. with 4in. to 5in. pipe ornamental, of galvanised iron	ditto 2 7 0
15in. with 7in. to 9in. pipe, and ditto	ditto 5 0 0

ARCHIMEDEAN Ventilators, unfixed—	£ s. d.
6in. diameter, No. 1 pattern	ditto 0 19 0
8 ditto	ditto 1 2 0
9 ditto	ditto 1 4 6
10 ditto	ditto 1 7 6
11 ditto	ditto 1 10 0
12 ditto	ditto 1 13 0
13 ditto	ditto 1 16 0
14 ditto	ditto 2 2 0
16 ditto	ditto 2 12 0
18 ditto	ditto 3 6 0
20 ditto	ditto 3 11 0
22 ditto	ditto 3 17 0
24 ditto	ditto 4 8 0
6 ditto	ditto 1 2 0
8 ditto	ditto 1 3 6
9 ditto	ditto 1 5 6
10 ditto	ditto 1 9 0
11 ditto	ditto 1 13 0
12 ditto	ditto 1 18 6
13 ditto	ditto 2 4 0
14 ditto	ditto 2 6 6
16 ditto	ditto 2 17 6
18 ditto	ditto 3 12 6
20 ditto	ditto 4 0 0
22 ditto	ditto 4 8 0
24 ditto	ditto 5 0 0

STEVEN'S Exhaust Ventilators, unfixed—	£ s. d.
No. 1 round base plain and galvanised,	
2in. shaft 6in. cone	ditto 0 7 6
3 ditto 8 ditto	ditto 0 9 0
4 ditto 10 ditto	ditto 0 12 0
6 ditto 13 ditto	ditto 0 18 0
8 ditto 17 ditto	ditto 1 5 0
10 ditto 20 ditto	ditto 1 15 0
12 ditto 24 ditto	ditto 2 13 0
15 ditto 27 ditto	ditto 2 17 0
18 ditto 30 ditto	ditto 4 0 0
21 ditto 34 ditto	ditto 5 5 6
24 ditto 40 ditto	ditto 6 12 0
7 1/2in. square base galvanised	ditto 1 0 0
10 ditto	ditto 1 7 6
12 ditto	ditto 1 18 6
15 ditto	ditto 2 12 6
18 ditto	ditto 3 5 0
22 ditto	ditto 4 10 0
25 ditto	ditto 5 10 0
28 ditto	ditto 6 18 0
32 ditto	ditto 7 8 0
12in. shaft ornamental of galvanised iron	ditto 9 5 0
15 ditto	ditto 11 3 0
21 ditto	ditto 13 18 0
24 ditto	ditto 16 15 0
30 ditto	ditto 20 0 0

THE EMPRESS Ventilator, unfixed—	£ s. d.
2in. pipe of hardened copper	ditto 1 2 0
2 1/2 ditto	ditto 1 5 0
3 ditto	ditto 1 7 6
4 ditto	ditto 1 11 0
5 ditto	ditto 1 13 0
6 ditto	ditto 1 17 0
8 ditto	ditto 2 9 6
10 ditto	ditto 3 6 0
12 ditto	ditto 4 0 0
15 ditto	ditto 5 0 0
18 ditto	ditto 6 17 0
21 ditto	ditto 19 0 0
24 ditto	ditto 13 5 0
2 1/2 ditto of zinc	ditto 0 13 6
3 ditto	ditto 0 15 6
4 ditto	ditto 0 17 0
5 ditto	ditto 0 19 6
6 ditto	ditto 1 2 0
8 ditto	ditto 1 5 0
10 ditto	ditto 1 7 6
12 ditto	ditto 2 6 0
15 ditto	ditto 3 6 0
18 ditto	ditto 4 4 0
21 ditto	ditto 6 12 0
24 ditto	ditto 8 16 0

BLACKMAN Air Propellers, unfixed—	£ s. d.
14in. propellers	ditto 4 15 0
18 ditto	ditto 6 15 0
24 ditto	ditto 9 10 0
30 ditto	ditto 12 5 0
36 ditto	ditto 16 5 0
42 ditto	ditto 23 15 0
48 ditto	ditto 35 0 0
60 ditto	ditto 46 10 0
72 ditto	ditto 58 10 0
14in. Wardle fan	ditto 3 18 0
18 ditto	ditto 5 15 0
24 ditto	ditto 7 10 0
30 ditto	ditto 10 10 0
36 ditto	ditto 12 15 0
48 ditto	ditto 18 10 0

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CROSSLEY'S Air Propeller, unfixed—			£ s. d.
12in. for ventilating, &c.	each	4	15 0
24 ditto	ditto	7	10 0
36 ditto	ditto	12	15 0
48 ditto	ditto	18	15 0
ÆOLUS Water Spray Ventilator—			
No. 1 delivering 4,000c.ft. per hour.....	ditto	5	15 0
2 ditto 6,000 ditto	ditto	7	5 0
3 ditto 12,000 ditto	ditto	9	10 0
4 ditto 15,000 ditto	ditto	11	10 0
5 ditto 19,000 ditto	ditto	12	5 0
6 ditto 24,000 ditto	ditto	13	5 0
7 ditto 30,000 ditto	ditto	15	5 0
8 ditto 40,000 ditto	ditto	17	0 0
DITTO Single-spray horseshoe pattern, unfixed—			
6in. delivering or extracting			
7 ditto 10,000c.ft. per hour	each	7	5 0
8 ditto 20,000 ditto	ditto	9	15 0
9 ditto 25,000 ditto	ditto	11	5 0
10 ditto 32,000 ditto	ditto	12	10 0
11 ditto 40,000 ditto	ditto	13	5 0
12 ditto 48,000 ditto	ditto	15	0 0
13 ditto 60,000 ditto	ditto	17	0 0
14 ditto 75,000 ditto	ditto	18	10 0
15 ditto 90,000 ditto	ditto	21	0 0
16 ditto 120,000 ditto	ditto	23	10 0
18 ditto 180,000 ditto	ditto	28	0 0
20 ditto 250,000 ditto	ditto	37	0 0
22 ditto 300,000 ditto	ditto	46	10 0
DITTO Double-spray, unfixed—			
6in. ditto 10,000c.ft. per hour	ditto	9	0 0
7 ditto 20,000 ditto	ditto	11	0 0
8 ditto 25,000 ditto	ditto	13	10 0
9 ditto 32,000 ditto	ditto	15	5 0
10 ditto 40,000 ditto	ditto	17	0 0
11 ditto 48,000 ditto	ditto	19	10 0
12 ditto 60,000 ditto	ditto	21	10 0
13 ditto 75,000 ditto	ditto	25	10 0
14 ditto 90,000 ditto	ditto	28	0 0
16 ditto 120,000 ditto	ditto	31	0 0
18 ditto 180,000 ditto	ditto	35	0 0
20 ditto 250,000 ditto	ditto	42	10 0
22 ditto 300,000 ditto	ditto	52	0 0
CAPELL Double-power Fan and exhaust, unfixed—			
14in. for removing dust, smoke, &c., and			
for ventilating	each	6	15 0
22 ditto for 6,000c.ft.	ditto	19	0 0
24 ditto 8,000	ditto	20	10 0
36 ditto 18,000	ditto	32	0 0
CLOSE Exhaust Fans, unfixed—			
10in. passing 1,000c.ft. per hour	ditto	5	15 0
20 ditto 5,000 ditto	ditto	13	10 0
30 ditto 10,000 ditto	ditto	27	0 0
BUCHAN'S Fixed Ventilators for exhaust			
poses, unfixed—			
1½ to 2in. pipe, plain pattern.....	each	0	11 6
2½ to 3½ ditto ditto	ditto	0	16 9
4½ to 5½ ditto ditto	ditto	1	0 6
6 to 7 ditto ditto	ditto	1	8 0
8 to 9 ditto ditto	ditto	2	5 0
9½ to 11 ditto ditto	ditto	2	16 0
12 to 13 ditto ditto	ditto	3	18 0
13 to 14 ditto ditto	ditto	4	10 0
KERSHAW'S Pneumatic Ventilators—			
2 to 3in. pipe, plain pattern.....	ditto	0	14 0
3 to 4½ ditto ditto	ditto	0	19 6
4 to 6 ditto ditto	ditto	1	10 0
5 to 7½ ditto ditto	ditto	2	9 0
6 to 9 ditto ditto	ditto	3	7 0
7 to 10½ ditto ditto	ditto	4	5 0
8 to 12 ditto ditto	ditto	5	5 0
9 to 13½ ditto ditto	ditto	6	10 0
10 to 15 ditto ditto	ditto	7	10 0
SHORLAND'S Octagonal Roof Ventilators. Design			
A, in strong zinc or painted galvanised			
iron, unfixed—			
3 to 4in. pipe	each	0	15 9
4 to 6 ditto	ditto	1	0 6
4½ to 7 ditto	ditto	1	7 0
5 to 8 ditto	ditto	1	17 0
6 to 9 ditto	ditto	2	8 0
7 to 10 ditto	ditto	2	15 0
8 to 12 ditto	ditto	3	15 0
9 to 13 ditto	ditto	4	5 0
10 to 15 ditto	ditto	5	5 0
14 to 21 ditto	ditto	8	10 0
18 to 27 ditto	ditto	13	0 0
VERITY BROTHERS Hydraulic Ventilators, unfixed—			
No. 1 size. 5 by 2½ outlet	each	5	5 0
2 ditto 6 by 4 ditto	ditto	8	15 0
3 ditto 7½ by 5 ditto	ditto	13	15 0
4 ditto 10 by 7 ditto	ditto	18	0 0
5 ditto 12 by 8 ditto	ditto	24	10 0
(For glass ventilators see Glazier.)			
SWEET'S patent chimney top, unfixed.....			each 1 2 0
MILBURN'S noiseless cowl ditto			ditto 4 0 0
BOYLE'S chimney cowl—			
15in. head 9in. pipe	ditto	1	16 6
16 ditto 10 ditto	ditto	2	2 0
17 ditto 11 ditto	ditto	2	7 0
(5s. 6d. to 11s. more if made fireproof.)			
KITE'S Albert Chimney Caps, unfixed—			
10 by 10 base by 30in. high, of zinc	each	1	2 0
14 by 9 ditto 36 ditto	ditto	1	7 0
14 by 9 ditto 40 ditto	ditto	1	13 0
14 by 14 ditto 40 ditto	ditto	1	13 0
(Add 12½ per cent. for galvanised iron.)			
LOBSTER Back Cowl, unfixed—			
4in. diameter of zinc	each	0	5 9
6 ditto ditto	ditto	0	8 9
8 ditto ditto	ditto	0	7 4
10 ditto ditto	ditto	0	7 9
11 ditto ditto	ditto	0	8 0
12 ditto ditto	ditto	0	9 0
4 ditto galvanised iron.....	ditto	0	8 6
6 ditto ditto	ditto	0	9 6
8 ditto ditto	ditto	0	10 0
9 ditto ditto	ditto	0	10 6
11 ditto ditto	ditto	0	11 9
12 ditto ditto	ditto	0	13 0

TALLBOT'S, unfixed—			£ s. d.
12 by 12 base, 5ft. high, 14 gauge	each	0	11 6
Ditto ditto 6ft. high	ditto	0	15 0
12 by 12 galvanised iron, 8ft. high, 9in.			
pipe, 24 gauge	ditto	0	14 0
Ditto ditto 8ft. high ditto	ditto	0	18 0
Ditto ditto 10 ditto ditto	ditto	1	2 0
Ditto ditto 6 ditto 10in. pipe.....	ditto	0	16 0
Ditto ditto 8 ditto ditto	ditto	1	0 0
Ditto ditto 10 ditto ditto	ditto	1	3 6
Ditto ditto 6 ditto 9in. pipe 20			
gauge	ditto	0	18 6
Ditto ditto 8 ditto ditto	ditto	1	3 6
Ditto ditto 10 ditto ditto	ditto	1	7 6
Ditto ditto 6 ditto 10 ditto	ditto	1	0 0
Ditto ditto 8 ditto ditto	ditto	1	5 0
Ditto ditto 10 ditto ditto	ditto	1	10 9
BRABY'S Fitzroy chimney top, unfixed—			
8in. diameter, with round base of gal-			
vanised iron	ditto	1	13 0
8 ditto ditto ditto	ditto	1	18 0
10 ditto ditto square base.....	ditto	2	17 6
12 ditto ditto ditto	ditto	3	5 6
BRABY'S Windmill, unfixed—			
3in. diameter of zinc, japanned black,			
with round base	ditto	0	15 6
4 ditto ditto ditto	ditto	0	16 6
6 ditto ditto ditto	ditto	0	18 6
8 ditto ditto ditto	ditto	1	2 6
10 ditto ditto ditto	ditto	1	8 6
IRON AND BRASS NUMBERS: 1, 2, 3—			
1½in. japanned, fixed	ditto	0	0 1½
1½ ditto ditto	ditto	0	0 1½
2 ditto ditto	ditto	0	0 2
2½ ditto ditto	ditto	0	0 2½
1½ brass ditto	ditto	0	0 2½
1½ ditto ditto	ditto	0	0 3
2 ditto ditto	ditto	0	0 3½
2½ ditto ditto	ditto	0	0 4½
CHINA NUMBER PLATES—			
3½ by 2½ black on white, fixed	ditto	0	0 6½
Ditto gold on white ditto	ditto	0	0 11
Ditto gold on black ditto	ditto	0	0 11
ENAMELLED IRON NUMBER PLATES, fixed—			
3½in. by 2½in. ordinary quality	ditto	0	0 7½
Ditto best ditto	ditto	0	0 8½
CHINA TABLETS, fixed—			
"Push" or pull 2½ by 2	ditto	0	0 6
Ditto 4½ by 2½	ditto	0	1 0
House 2 by 1	ditto	0	0 2½
Ditto 3 by 1	ditto	0	0 2½
Night 2½ by 1½	ditto	0	0 2½
Ditto 3½ by 1½	ditto	0	0 3
W.C. 3 by 2½	ditto	0	0 6
Ditto 4 by 2½	ditto	0	0 6
In or out 1½ by 1	ditto	0	0 6
Ditto 2½ by 1½	ditto	0	0 7½
Private 2½ by 2½	ditto	1	3 0
Ditto 6½ by 2½	ditto	1	8 0
Ditto 7 by 3	ditto	0	1 10
Ditto 11 by 3	ditto	0	2 2
Office 7 by 1½	ditto	0	1 3
Ditto 7 by 2½	ditto	0	1 6
Ditto 7 by 3	ditto	0	1 8
Ditto 11 by 2	ditto	0	1 10
Ditto 11 by 2½	ditto	0	2 1
Ditto 11 by 3	ditto	0	3 0
Coffee room 7 by 3	ditto	0	1 10
Ditto 10 by 3	ditto	0	2 6
ENAMELLED IRON TABLETS, unfixed—			
9in. by 3in. 3in. letters	ditto	0	6 0
Ditto ditto best	ditto	0	9 0
5in. tablets, 3in. letters	per letter	0	0 7
Ditto ditto best quality	ditto	0	0 9½
2in. plug tablets, 8 by 9	each	0	2 6
Ditto ditto best	ditto	0	3 3
BRASS LETTERS, to screw on or drive, unfixed—			
1½in. brass letters	each	0	0 2½
1 ditto ditto	ditto	0	0 2½
1 ditto ditto	ditto	0	0 3
1½ ditto ditto	ditto	0	0 3½
1½ ditto ditto	ditto	0	0 3½
2 ditto ditto	ditto	0	0 6
2½ ditto ditto	ditto	0	0 8½
3½ ditto ditto	ditto	0	1 2
PORCELAIN LETTERS, unfixed—			
3in. white marble in 2 or 3 patterns	ditto	0	0 7½
4 ditto ditto ditto	ditto	0	0 9½
6 ditto ditto ditto	ditto	0	1 5
8 ditto ditto ditto	ditto	0	1 9
10 ditto ditto ditto	ditto	0	3 0
12 ditto ditto ditto	ditto	0	5 0
3in. white marble, gold veins	ditto	0	1 2
4 ditto ditto ditto	ditto	0	1 6
6 ditto ditto ditto	ditto	0	2 9
8 ditto ditto ditto	ditto	0	3 9
10 ditto ditto ditto	ditto	0	5 6
12 ditto ditto ditto	ditto	0	7 6
OPAL LETTERS, for attaching to glass, unfixed—			
1½in. in several designs and plain opal			
2 ditto ditto ditto	each	0	0 2½
2½ ditto ditto ditto	ditto	0	0 3
3 ditto ditto ditto	ditto	0	0 4½
4 ditto ditto ditto	ditto	0	0 5
5 ditto ditto ditto	ditto	0	0 6
6 ditto ditto ditto	ditto	0	0 7½
7 ditto ditto ditto	ditto	0	0 9½
8 ditto ditto ditto	ditto	0	0 11
10 ditto ditto ditto	ditto	0	1 0
OPAL DITTO, with burnish gold shade, unfixed—			
1½in. in several shapes	each	0	0 4
2 ditto ditto	ditto	0	0 6½
2½ ditto ditto	ditto	0	0 8½
3 ditto ditto	ditto	0	0 10
4 ditto ditto	ditto	0	1 1
5 ditto ditto	ditto	0	1 3
6 ditto ditto	ditto	0	1 6½
7 ditto ditto	ditto	0	1 9
8 ditto ditto	ditto	0	2 2

OPAL LETTERS, embossed gold or silver, unfixed—		£	s.	d.
1½in. several shapes	..... each	0	0	8
2 ditto ditto	..... ditto	0	0	10½
2½ ditto ditto	..... ditto	0	1	0
3 ditto ditto	..... ditto	0	1	2
4 ditto ditto	..... ditto	0	1	7
5 ditto ditto	..... ditto	0	2	1
6 ditto ditto	..... ditto	0	2	8
7 ditto ditto	..... ditto	0	2	9
8 ditto ditto	..... ditto	0	3	2
IRON LETTERS for fascias—				
8in. high, ½ teeth, painted, with bevelled				
edges.....	ditto	0	1	6
Ditto ditto ditto gilt on face.....	ditto	0	2	6
WOOD LETTERS, unfixed—				
4in. to 10in. or more high, with gilt face,				
coloured edges.....	per inch high	0	0	3½
4in. to 10in. shaded wood letters with gilt				
face and coloured shade	ditto	0	0	4½
Ornamental shapes extra per inch	ditto	0	0	2½
BRASS WINDOW PLATES, unfixed—				
6in. wide and flat.....	per ft. run	0	3	10
7 ditto ditto	ditto	0	4	6
8 ditto ditto	ditto	0	5	6
9 ditto ditto	ditto	0	5	11
10 ditto ditto	ditto	0	6	9
11 ditto ditto	ditto	0	7	3
12 ditto ditto	ditto	0	8	0
6in. ditto and convex	ditto	0	5	0
7 ditto ditto	ditto	0	5	8
8 ditto ditto	ditto	0	6	6
9 ditto ditto	ditto	0	7	3
10 ditto ditto	ditto	0	8	0
11 ditto ditto	ditto	0	8	10
12 ditto ditto	ditto	0	9	6
6 ditto ogee shape	ditto	0	5	0
7 ditto ditto	ditto	0	6	0
8 ditto ditto	ditto	0	6	10
9 ditto ditto	ditto	0	8	0
10 ditto ditto	ditto	0	8	6
11 ditto ditto	ditto	0	9	3
12 ditto ditto	ditto	0	10	0
Angle blocks and fittings extra				
The prices include wood backing				
Plain letters engraved at 3d. per inch length of letter.				

throughout the establishment, and can here be seen in process of manufacture.

In the iron foundry there are three cupolas, two of about three tons capacity each, and one of seven tons. There are two overhead travelling cranes, one 15-ton hand gear and one 10 ton, driven by square shaft running the full length of the shop. About 40 tons of castings are turned out per week. The brass foundry and copper-smith's shop adjoin the iron foundry. In the boiler shop there are six overhead travelling cranes driven by flying ropes. The greater portion of the riveting is done by means of two fixed and four portable hydraulic riveters, worked by special pumps and accumulators, two of the portable riveters being specially designed for foundation and fire-hole rings. A large punching press for engine frame-plates 1½ in. thick was seen at work, also horizontal and vertical plate-bending rolls. In the flanging shop there are two hydraulic presses for flanging and stamping plates, worked at a pressure of about 1,600 lb. per square inch, giving on the 20 in. ram of the large press a total pressure of about 220 tons. Boiler, firebox, and other plates connected with engines and tender work are flanged here. The plates are lifted by a specially-constructed crane, and are heated in a gas furnace, the gas being supplied from Wilson's Patent Gas Producers, of which there are four outside the shop, two being in use at a time. Six other furnaces are also supplied with gas from these producers. In the steam hammer shop, stamping by means of blocks and dies was seen carried on to a large extent. There are four gas furnaces which are supplied with gas from the Wilson's Producers; an extra heat per day is got out of these furnaces as compared with those heated with coal. In the smithy was seen the forging of the various parts required in a locomotive, also machines for making rivets, bolts, and nuts. In the wheel shop there are two powerful hydraulic presses for pressing the wheels on and off the axles; these are worked by pumps which give a pressure on the ram of 200 tons.

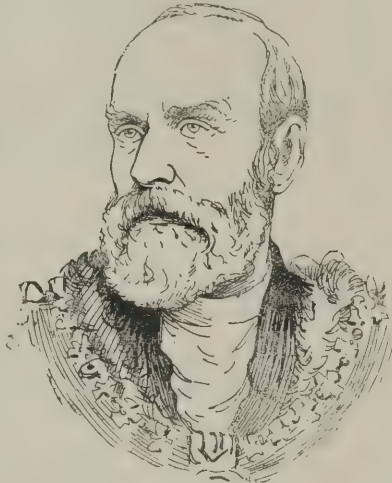
In the carriage department were seen, in course of construction, four first-class saloons, and 30 third-class suburban carriages, and in the saw-mills some of the best and most improved machinery for cutting up, planing, moulding, and preparing the wood, ready for the use of the carriage and van-builders. There are also machine, fitting, and smith shops in this department.

The wagon department also has extensive saw-mills, and in the wagon shop were seen about thirty 10-ton coal waggons and thirteen cattle boxes in course of construction. Near here is a shop for the manufacture and repairs of carriage and wagon wheels. In the boiler-house attached to the wagon department saw-mills are three stationary boilers of the locomotive type, fitted for burning liquid fuel in combination with solid incandescent fuel. Close by is an oil gas-works in connection with train lighting. After generation, the gas is washed on its way to the gas-holder, and then compressed into cylindrical holders to 11 atmospheres. There are five of these holders in use, each capable of holding 12,500 cu. ft. of gas. The receivers on the carriages are charged to a pressure of seven atmospheres. The average amount of gas made in winter is about 160,000 cu. ft. per week at atmospheric pressure, and in summer about 80,000 cu. ft. per week. The boiler which supplies steam for working the compressing engines burns, as fuel, the tar which is a by-product from the manufacture of the gas. Liquid fuel is also used in the boiler shop for two of the rivet furnaces; the rivets are heated quicker than with coal furnaces, and are not scaled to such an extent. The furnaces are also heated to the required temperature in much less time, and the heat is more under control. The same system was seen as applied to locomotives in combination with solid incandescent fuel.

THE PLUMBERS' COMPANY AND THE NEW LORD MAYOR.

AT the quarterly meeting of the court held at Guildhall last Friday the following officers were severally sworn into office for the year ensuing:—Master, Mr. Alderman Stuart Knill (Lord Mayor elect); warden, Mr. W. H. Bishop; renter-warden, Sir Philip Magnus, B.A., B.Sc. The new master will doubtless earn the

respect of the craft as its chief officer in as high a degree as he has won public esteem by his straightforward manliness as regards his religious opinions in connection with his election to the chief magistracy of the City. We herewith give a portrait of the new master of the Plumbers' Company and Lord Mayor elect. Alderman Stuart Knill, is the only son of the late Mr. John Knill, of Fresh Wharf and Botolph Wharf, and was born at Camberwell in 1824. He was educated at the Blackheath Proprietary School, and afterwards at the University of Bonn, where he graduated. He is now the head of the firm of Messrs. John Knill and Co., wharfingers and warehouse keepers. He married, in 1850, Mary Anne, daughter of the late Mr. Charles Rowland Parker, solicitor, of Greenwich. He resides at the Crosslets, in the Grove, Blackheath. In 1845 he took up his freedom in the Goldsmiths' Company, and is also a member and master of the Plumbers' Company, in whose movement for



ALDERMAN STUART KNILL, LORD MAYOR ELECT.

the registration of plumbers he has taken great interest, and of the Gold and Silver Wyre Drawers' Company. In 1885 he was unanimously elected Alderman of the Ward of Bridge, in succession to Sir Charles Whetham. He is a justice of the peace for the counties of London and Kent, and was long a member of the Greenwich Vestry and District Board. As already indicated, he is a leading lay member of the Roman Catholic Church, and in politics a staunch Unionist and Conservative. He is a member of several learned societies. He is a large employer of labour at his wharves near London-bridge.

THE A.A. "BROWN BOOK."

THE annual "Brown Book" of the Architectural Association has just been published, and shows little variation from that of last year, except that the lectures and classes are now enumerated under four divisions instead of in as many years. The committee in their annual report, which is very guarded in its tone, state that the results of the new scheme of education, which was started during the year, have been, on the whole, encouraging, though, as they admit, "there are many difficulties requiring careful consideration and adjustment which are necessarily attendant upon the launching of such a comprehensive scheme." The premises at Great Marlborough-street, although cramped in accommodation, have answered the purpose as well as could have been expected without unduly hampering the funds of the Association. Turning to the progress of the new scheme, it is noted that the first and second year's courses have been well supported, while the third year's courses have been thinly attended, and, owing to lack of students, part of the fourth year's course was not started. The success, financial and otherwise, of the first two years is encouraging. The committee point out that although the subscription and entrance fees have been doubled, 98 new members have been elected during the session; but on referring to the rolls of membership, we note there has been a slight decrease, the total number being now 1,125 against 1,137 last year, and 1,129 in 1890-91.

A curious sentence in the report states that "The Session has been marked by much animated discussion as to the methods of architectural education, and the Association has been favoured with considerable criticism." During the session an address was given by the President, Mr. F. T. Baggallay, and papers were read by Messrs. W. H. Bidlake, C. H. Brodie, H. Wilson, T. Graham Jackson, J. Garnett, N. H. J. Westlake, Maurice B. Adams, Max Clarke, J. A. Gotch, E. A. E. Woodrow, H. Townsend, and C. R. Ashbee.

The following is the syllabus of meetings for the session:—

- Oct. 7 (To-night). Opening Conversazione at the Imperial Institute.
- Oct. 21. Annual Meeting; address by the President, H. O. Cresswell.
- Nov. 4. "Notes on the Application of an Architectural Education," W. Young.
- Nov. 18. "Some Mysteries of Modern Architecture," Paul Waterhouse.
- Dec. 2. Subject to be announced.
- Dec. 16. Subject to be announced.
- Jan. 13, 1893. "The Influence of Byzantine Art in Italy from the 6th to the 12th Centuries," R. Phené Spiers.
- Jan. 27. "The Small Suburban House," Sydney Vacher.
- Feb. 10. "The Value of Criticism," C. J. Tait.
- Feb. 24. "Individuality and Originality in Art," A. E. Street.
- March 10. "Screens: their Treatment and Symbolism," G. H. Fellowes Prynn.
- March 24. "In Praise of a Country Practice," J. A. Gotch.
- April 14. Members' Soirée.
- April 28. "Hygiene in its Application to the Arrangement of Buildings," P. Gordon Smith.
- May 12. Subject to be announced. E. Guy Dawber. Nomination of officers.
- May 26. "The Travelling Student's Notes," by T. A. Sladdin. Election of officers.
- May 31. Annual dinner.

CHIPS.

A new branch bank at Aston Cross was opened on the 27th ult. by the Birmingham District and Counties Banking Company. The premises comprise a banking-room (22ft. by 21ft.), private-room, strong-room, and a residence for the sub-manager. The building is three stories in height. The front is of Ruabon red bricks, with dressings of Hollington stone to the lower story, and of terracotta to the upper portion. Messrs. James Smith and Sons, of Great Tindal-street, Birmingham, are the builders, and Mr. Cooper Whitwell, of Cannon-street, in the same city, is the architect.

The Medical School wing of Bristol University College was opened on Monday. It forms the first portion of the chief front of the College, and has cost £7,000. The walls are of red Pennant stone, with Bath-stone dressings. On the first floor, reached by a wooden staircase, are the library, laboratory, and lecture-room. The internal woodwork is throughout of pitchpine. Mr. F. Bligh Bond, of Corn-street, Bristol, is the architect, and Mr. G. Humphreys, of Stapleton-road, the contractor.

The Roman Catholic Bishop of Liverpool laid, on Sunday, the foundation-stone of a new school-chapel for the rapidly-extending district of Denton's Green, St. Helen's. The new building will be erected between Denton's Green-lane and Greenfield-road, will be Gothic in style, and is to be dedicated to St. Thomas, of Canterbury, to whom the neighbouring old Windlesham Abbey is also dedicated. Messrs. Sinnott, Sinnott, and Powell, of Liverpool, are the architects, and the tender of Mr. James Almond, North-road, St. Helen's, has been accepted at about £2,000.

Mr. D. Sutherland, timber merchant, of Pulteney Town, N.B., was returned on Saturday at the head of the poll at the election of commissioners for that burgh.

At the parish church of Deuling, Kent, on Sunday, a new reredos was unveiled. It is decorated in style, and constructed of oak, having three crocketed canopies inclosing panels of glass mosaic. Mr. E. P. Loftus Brock, F.S.A., was the architect, and Mr. P. J. Cooke, of Kennington, executed the work.

The work of re-erecting Alfred Stevens's monument to Wellington in a bay on the north side of the nave of St. Paul's Cathedral is progressing steadily. It is not complimentary to the English nation to learn that £300 is still wanting to defray the cost of the removal. Sir Frederick Leighton and the Dean of St. Paul's are the treasurers. The work of the completion of the monument by the addition of the originally intended equestrian figure, according to the approved design, is postponed until the removal and re-erection on the site in the nave originally desired by Stevens is finished, and the expense defrayed.

By 1,295 votes against 369, the ratepayers of Gravesend have resolved to adopt the Public Libraries Act.

CONTENTS.

Amateurs as Clients	481
Art in Iron Roofs	481
Applied Architecture	482
Iron Arches of Large Span.—II.	483
Architecture: an Art, a Science, and a Profession	484
Ventilation	486
Prices.—XLVIII.	486
The Society of Engineers at Stratford	487
The Plumbers' Company and the New Lord Mayor	488
The A.A. "Brown Book"	488
The Building News Directory	XLIX.
Our Illustrations	489
Sketches of Old Furniture	490
Way-side Notes	508
Precipitation Work and Sewage Destroyers at Southampton	508
Notes from Paris	509
The Cleansing and Ventilation of Sewers	509
Obituary	510
Competitions	510
Archæological	510
Archæological and Architectural Societies	511
Building Intelligence	511
Correspondence	512
Intercommunication	512
Legal	513
Legal Intelligence	513
Water Supply and Sanitary Matters	514
Our Office Table	514
Statuses, Memorials, &c.	515
Trade News	515
Tenders	515

ILLUSTRATIONS.

PREMIATED DESIGNS FOR THE PROPOSED MUNICIPAL TECHNICAL SCHOOL AT MANCHESTER.—THE CARNEGIE FREE LIBRARY, AYR.—PROPOSED MISSION CHURCH, BLACK HEATH, WONERSH, GUILDFORD.—HOUSES AT BOOTHAM, YORK.—STATUE OF THE GREAT ELECTOR, BERLIN.—FIRE-ENGINE STATION, GRAYS.—TYPES OF OLD ENGLISH FURNITURE FROM WINCHESTER.—SIXTEENTH-CENTURY FRENCH ARMCHAIRS.

Our Illustrations.

MANCHESTER TECHNICAL SCHOOL COMPETITION.

THE first, second, and third premiated designs have been published in our pages during the past fortnight, and we give to-day in completion of the series, the plans and elevation of the fourth prize design by Mr. Theodore Sington, of Manchester, whose façade is intended to be erected in red brick and terracotta. The general arrangements are shown by the two principal floor plans. The other elevation herewith printed is by Messrs. Spalding and Cross, and illustrates the principal front of the chosen design, of which the perspective view and plans appeared in the BUILDING NEWS for Sept. 23rd.

CARNEGIE FREE LIBRARY, AYR.

THIS building, which is being erected from the designs of Messrs. Campbell Douglas and Morrison, architects, Glasgow, is now approaching completion, and from its prominent situation, looking down Cathcart-street and along the new bridge, does not fail to arrest attention. On the principal floor, which is 6ft. above the street level, are placed the lending library, general reading-room, and committee-room, &c. The upper floor is occupied by the reference library, ladies' reading-room, and the museum, or picture gallery. In the lending library there will be accommodation for 25,000 volumes, and in the reference library 5,000 volumes. The basement floor is 3ft. below the street level, and is occupied by the heating chamber, book stores, workshop, lavatory, &c. The librarian's house is in the north wing, on two floors, between the street level and the floor of the museum. With the exception of the reading-room, the floors are all of fireproof construction. The mason-work is built of red stone from the Ballochmyle quarries. Internally, various descriptions of tiles are used on the floors and walls. In the museum and picture gallery the principal part of the walls available for pictures is being constructed with curved surfaces, similar to what has been found so admirable in the new picture galleries, Dundee. The estimated cost amounted to £7,600, and as far as is apparent, the building will be completed within the sum. The memorial stone was laid on Wednesday by Mrs. Carnegie.

MISSION CHAPEL AT BLACK HEATH.

THE mission chapel and school-room at Black Heath, Womersh, Surrey, is intended to accommodate about 180 people. The exterior has been purposely kept simple, and without smallness of detail, and reminiscent of the small wayside

chapels in Tyrol and North Italy, where effect is sought entirely by proportion and colour-treatment. The concrete walls are roughly plastered externally, and distempered a warm tint, and the arches to the windows, &c., are of specially-made bricks of a deep red colour. The interior is to be painted throughout with figure subjects. Messrs. Brown, of Bramley, are the builders, and the architect is Mr. C. Harrison Townsend, of 29, Great George-street, Westminster.

HOUSES AT BOOTHAM, NEAR YORK.

THE original drawing herewith reproduced was shown by the architect, Mr. Arthur S. Jones, A.R.I.B.A., architect, of Chelsea, at the Royal Academy this year. The two plans carefully show how a variety of treatment has been obtained by bringing one entrance out of the return street and a picturesqueness of planning secured by cleverly adapting the special limits imposed by the irregular line of the site. Timber, stone, brick, and tiles combine to produce an artistic effect.

STATUE OF THE GREAT ELECTOR, BERLIN.

THIS group, from the hand of Andreas Schluter, the contemporary of Grinling Gibbons the Dutchman, stands on the Long Bridge near the Castle and the Schlossplatz, in the heart of Berlin, overlooking the Spree. The equestrian statue of the Great Elector, Frederick William, is executed in bronze, and represents the rider garbed in the capacious folds of a Roman toga, riding with dignity and serene magnificence, after the fashion of the Rococo period. It possesses considerable merit as a work of art, notwithstanding the redundancy of the composition. This reaches its climax here perhaps in the treatment of the chained figure nearest the spectator, where the right foot rests upon a helmet, and the other, beyond the confines of the lower step, is placed on some specially-concocted drapery extending to the pavement. The freedom of the general lines of the pedestal and the details of the group as a whole are eminently characteristic of its date (1703), but the pleasing breadth and sense of scale which governs the general conception compares very favourably with the paucity of design and feebleness of idea so often conspicuous in similar works of more recent date. Berlin itself supplies a notable instance of this in the much-belauded statue of Frederick the Great, modelled by Rauch at the cost of the Government in 1851. The granite pedestal in three stages is surrounded by bronze groups serving as a frieze, illustrative of the great military commanders of the Seven Years' War, on foot and horseback, all to life-size and portraits. The Emperor himself is represented in the habit of his daily life, copied in minute particulars and enlarged to heroic size, as the statue itself is 17ft. high. Capital as the individual features may be, the outline of the whole is petty and poor as contrasted with Schluter's work. We have reproduced our illustration, by permission, from the first part of a splendidly produced new folio on the "Statues of Europe," issued by the indefatigable Herr Von Ernst Wasmuth, of Berlin, who, under the title of "*Monumente und Standbilder Europas*," is grouping together a series of specially taken photographs from all parts. If the whole compare in excellence with those contained in the opening selection, the work must be of universal interest. In the present book, besides photographs of the two statues already mentioned, we have Baron Carlo Marochetti's Richard Cœur de Lion (1854) in Old Palace Yard, shown by a very artistic photograph, with Henry VII. Chapel and St. Margaret's Church in the middle picture. A lad well placed brings out the scale and high light of the pedestal capitol. The Albert Memorial, by Sir Gilbert Scott (1870), is the other London example. From Paris figures the Vendôme Column (1806), and from Vienna Marchesi's Kaiser Franz I., erected in 1846, the Archduke Charles near the Burgthor (1859), and the Maria Theresa Monument, put up in 1883, so that the work is brought down to contemporary productions. St. Petersburg furnishes Falconet's prancing Peter the Great (1782), and from Copenhagen Christian IV., dated 1810, by Thorwaldsen. The plates measure 19in. by 12in., and are printed by the colotype process.

FIRE STATION, GRAYS.

THE growing little town of Grays, on the north bank of the Thames, about 20 miles from London, has been for some years now a home of the

Portland-cement trades, and of the manufacture of the so-called "London Stocks," which, in spite of all the advancements of machinery, continue to be hand-made to-day in precisely the same way as Daniel de Foe made bricks at his historic tileries at Tilbury, close by. One of the old institutions of the place is its volunteer fire brigade, and it has been needed, and in its time, even quite recently, has performed some signal services. Mr. J. Theobald, M.P., the lord of the manor, having granted a site to the local board, their surveyor was instructed to prepare a scheme and a plan, and a loan of £1,500 has been sanctioned. The building is designed for the accommodation of the equipments of a first-class brigade, with a drill-room on the first floor, and a drill-yard in the rear. As the newly-fledged board does not as yet possess a fire-steamer, but owns and uses the more common-place appliance of a steam road-roller, the latter machine will, for the present, make use of the engine-house with its necessary pit in the floor, and its telescopic funnel to slide into the ordinary chimneys. An attempt has been made in the building to enhance the effect of modern Queen Anne by harmony of colour, the light cream of ordinary stone being relieved by selected common London stocks, with the gables of the natural bluish grey of carved Portland cement, the carving, needless to say, executed in its plastic state and with plenty of undercut, an art as yet in its infancy, the result, by a judicious selection of cement, and the absence of other manipulation, being expected to be equal in durability to ordinary Portland stone. A local red brick is also introduced. The design, as now illustrated, was exhibited in the Royal Academy, and is being carried out by Mr. W. H. Archer, of Gravesend, with Mr. Wm. Wilks, as sub-contractor for masonry, under the supervision of Mr. Charles Cobham, F.S.I., the local board's surveyor and architect.

FRENCH ARM-CHAIRS OF THE 16TH CENTURY.

THE rare character of these four chairs from the Louvre makes them especially interesting on this side of the Channel, as seldom, if ever, are their counterparts to be seen in our country. They all express quiet dignity, more particularly perhaps the last on our sheet, with the quaint entrance rendered in perspective with different coloured woods. The seats, like some of our early chairs, are V-shaped on plan, two of them being treated in the usual way with four legs at the angles, the other two having a central support carried on three spreading feet, somewhat suggesting the music-stool. Our sketches were made from plates in "*Le Moniteur des Architectes*."

CHIPS.

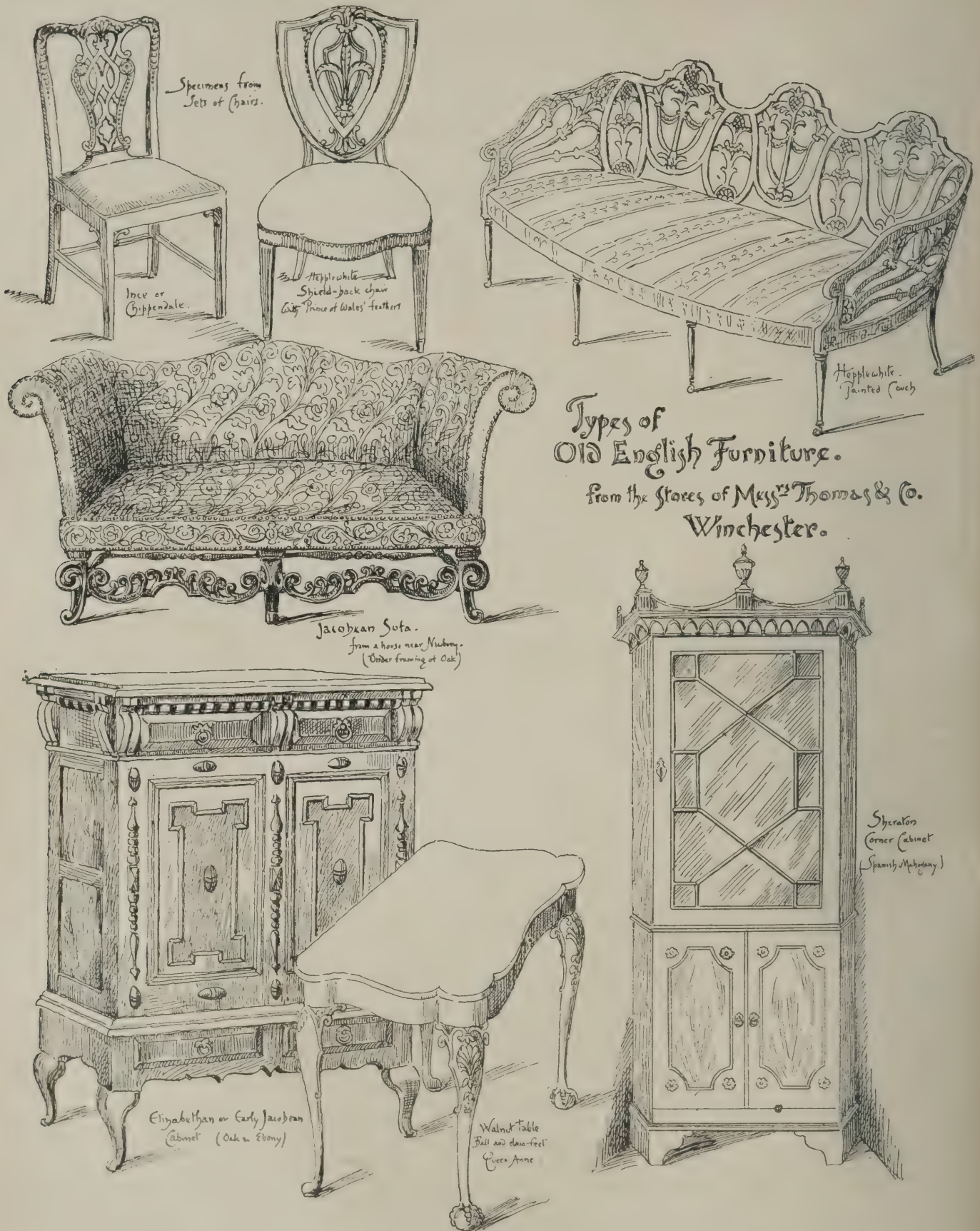
Sir T. D. Gibson-Carmichael, Bart., has intimated his intention of presenting to the Selkirk Free Library Committee full-sized copies in bronze of the famous "Resting Mercury" in the museum at Naples, and also of the "Adorante"—perhaps the two most beautiful specimens of Greek bronze sculpture which have hitherto been found. The bronzes, which are from piece-moulds of the original, are already on their way.

A medallion head of the late Dr. Alexander Kilgour, which has been executed by Mr. John Hutchison, R.S.A., Edinburgh, is to be placed in the Aberdeen Royal Infirmary.

Mr. Joseph T. Firbank, the well-known railway contractor, who contested the Haggerston Division of Shoreditch in the Conservative and Unionist interest at the last election against Mr. W. R. Cremer, M.P., was presented on Monday at the Haggerston Constitutional Club, Kingsland-road, with an illuminated address.

Under initials which thinly veil the name of Mr. Walter Millard, a letter appears in Tuesday's *Times* mentioning that No. 7, Delahay-street, Westminster, once the residence of the notorious Judge Jeffreys, is now in process of demolition. The house itself, Mr. Millard adds, "is well worth inspection as a good specimen of what is now a rapidly-fading type of Domestic architecture. The spacious, dignified staircase and entrance-hall is calculated to send a shudder through the designers of our modern pinched and skimpy dwellings."

The Accrington town council sanctioned, on Monday, a scheme for purchasing land for the erection thereon, at a cost of under £10,000, of an electric lighting station to supply the town with the electric light. The corporation have also under consideration the purchase of the gas and water-works for £700,000.



Types of Old English Furniture.

From the Stores of Messrs Thomas & Co.
Winchester.

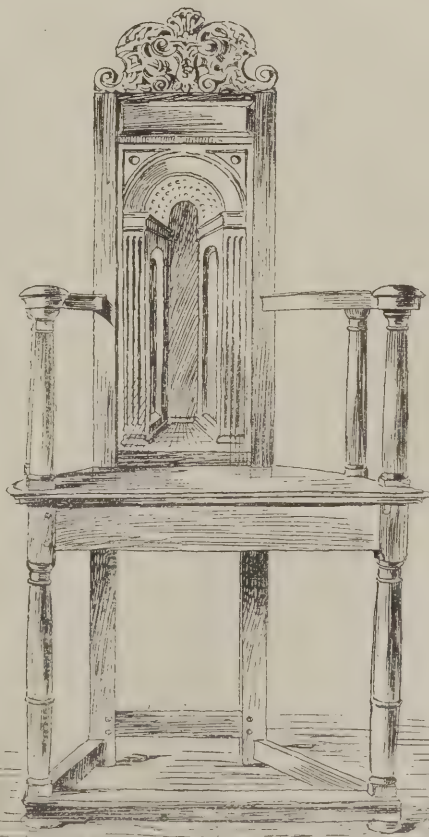
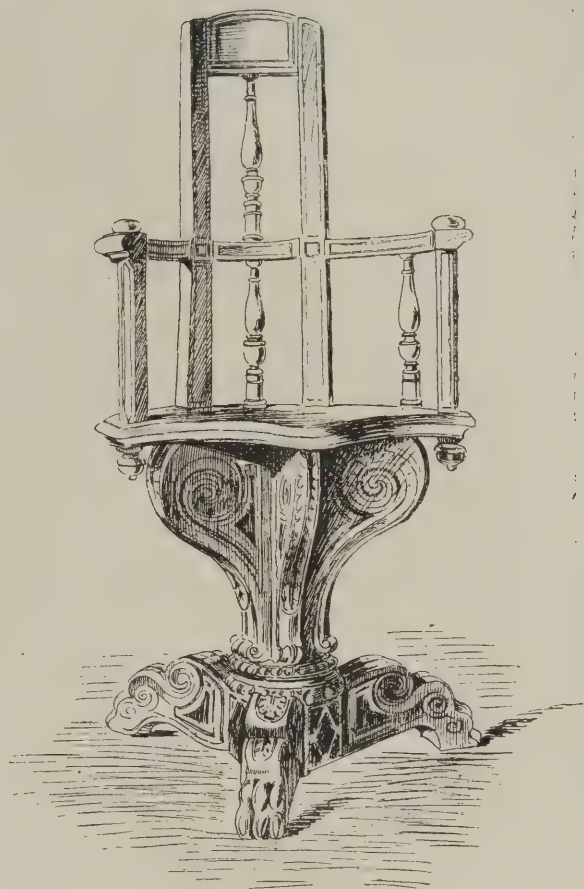
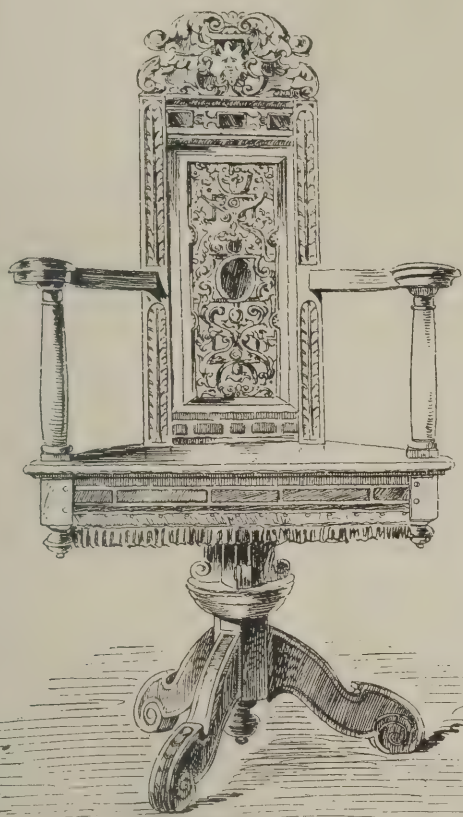
SKETCHES OF OLD FURNITURE.

THE accompanying sketches serve to illustrate some types of furniture made in England up to the beginning of this century. The art of cabinet-making in this country was carried on with as great skill, and, as a rule, in more refined and less extravagant styles, than in any country abroad. The oldest pieces illustrated are the quaint oak Cabinet with the Elizabethan or Early Jacobean ornamentation of halved turned work planted on, and the elaborate mitrings of mould-

ings in panels, and the fine old Sofa with carved oak rails connecting the square bow legs, which came originally from Shaw House, near Newbury, and was picked up in a broker's shop and "restored" from an almost shapeless ruin. The rarest piece of furniture is the painted Couch of the Hepplewhite school (in 1770) from a village near Winchester. The sketch gives the design of the woodworks but little idea of its appearance, as it is painted all over with lilies, pine apples, &c., in quiet colouring on a sage-green ground. It has a look of too great

fragility, but is very strongly constructed of beech and ash, every joint being beautifully bound and tenoned together. The Chairs are examples of the more ordinary types of the last century, and show what beauty of design and careful thought was exercised in the treatment of the backs. They are made of the now extinct Cuba or Spanish mahogany, very heavy, and of dark colour and fine grain, which was in such demand in the time of Sheraton, Chippendale, and their followers, that the supply became entirely exhausted.

FRENCH ARM-CHAIRS OF THE SIXTEENTH CENTURY



WAYSIDE NOTES.

THE uncertainty regarding the genuineness of the so-called "Garden Tomb" at Jerusalem makes the sum of £4,000 a decidedly heavy price to pay for its acquisition. Supposing that a tomb of undeniable identity were forthcoming, one can imagine any sum being paid and subscribed by enthusiastic persons. As it is, would-be subscribers hesitate, and this is certainly well. There can never be any good effected by purchasing things of hypothetical interest. More probably harm is done, and people led to the belief that that is which is not.

Many writers of experience in matters of Biblical interest in Palestine and Jerusalem have stated their reasons for not giving credence to the theory. Unfortunately, the late General Gordon having pronounced in favour of the probable authenticity of the tomb, the public, with a natural reverence for all thoughts and actions of that great soldier, have exhibited a blind faith in his views as to the question in debate. This is calculated to lead to an enthusiastic impetuosity in the matter of purchasing the tomb. Far better is it to leave the uncertain in uncertainty. Faith is one thing; a positive view in matters of uncertainty is another, and persistence therein neither productive of good in the present nor future. When due season arrives, let the spikenard be bruised; until then the perfume should be husbanded. Four thousand pounds in charitable works seems more in accordance with the spirit that breathes over the subject than any expenditure on a tomb of doubtful identity.

Missionaries who do not respect the ancient usages, and even minor superstitions and prejudices, of the peoples among whom they work are not likely to effect much good. From a paragraph in the *Times* regarding missionaries and tall buildings in China, I learn that much offence is given to the natives by reason of the height to which the missionaries carry their buildings, either residences or churches. The Pekin correspondent of a Shanghai journal says that the Chinese dislike buildings of many stories, it being their idea that the privacy of their own dwellings is invaded by the practice. They accordingly remove from the proximity of such buildings. Yet all over Pekin, it is said, mission stations are easily recognised by their large upper stories. As the houses near such places are deserted, the landlords are greatly injured, being obliged to sell their premises at a great loss to the mission stations. Chimneys, too, seem a great cause of offence, especially when they confront a native whenever he opens his door, while verandahs overlooking the courts of native houses are sources of serious objection. It appears that the Roman Catholics have been great offenders in erecting high churches, dominating all the houses around. When the Peitang or northern cathedral in Pekin was built, it overlooked the precincts of the Imperial Palace, and was long an eyesore to the people. At first it was sought to shut it out by erecting a huge wall, and at length was, after long and troublesome negotiations, bought by the Empress-Dowager, and inclosed in the Palace grounds. The correspondent further says that an epidemic of building upper stories has seized the missionaries in Pekin. He also says that Sir Frederick Bruce was opposed to missionaries visiting Pekin. After they came, he advised them "to conduct their operations in a quiet, unostentatious manner, and to begin their services in the lanes in native buildings."

It may seem foolish enough here, where everyone overlooks someone else, but to ride roughshod over native prejudice is scarcely judicious, and certainly ill-becoming in missionaries. As a matter of fact, excessively high building does give offence even in this country, and doubtless the Pekin mission-stations are, to the Chinese native, houses what Hankey's Folly and other "sky-scrapers" are to the average London building. In any country the erection of buildings far in excess of the average height is—properly considered—an offence to society. One would imagine, therefore, that the builders of obnoxious buildings in China would have desisted as soon as they found their practice objectionable, and that they were not "becoming all things to all men" like the first apostle to the Gentiles. Respecting Sir Frederick Bruce's requests of the missionaries, the correspondent of the Shanghai journal says:

"If there was room for this wise advice immediately after the war, how much more now, when China is scrutinising closely the treaty provisions."

I would that what Lord Rosebery said *re* the dignity of manual labour at the opening of the Borough-road Polytechnic Institute should be taken to heart by many young men now just commencing a mercantile career with small prospect of ever getting beyond the clerkship stage. They should remember that the words are only an echo of what Mr. Gladstone has but recently said, and other great men have urged the same for years. The time should come when the mock respectability that clings to the career of clerkship when in prospect only should fall away like scales from the eyes of "parents and guardians" of humble means. "Mrs. Grundy" unfortunately generally enters most frequently into homes where her presence can least be afforded. The lower middle-class possibly think more of "appearances" than any other persons in whatever stratum of society. To wear a long-sleeve hat and a cut-away coat, with umbrella and black bag to match, being considered necessary to respectability, so many youths are, in consequence, doomed to life-long and miserable drudgery. There is happily just a chance—perhaps a very good chance—of the modern polytechnic institution effecting much good in this matter. In view of this possibility let us hail with joy each institution as it appears.

An article, evidently of American inspiration, in the current *Scribner's* gives statistics concerning the buildings of the Chicago Exhibition. It veritably gloats over the bigness of the things. Take, for example, the rhapsody on the Manufactures and Liberal Arts Building:—It is 1,687ft. by 787ft. in size. It covers about thirty-one acres. The great main roof covers an area 1,400ft. by 385ft., and has an extreme height of 210ft. This is between 55ft. and 60ft. higher than the great arch of the Machinery Building in the recent Paris Exposition. It is only 10ft. less in height than the great chimney of the New York Steam-Heating Company. It is just 6ft. lower than the top of the spire of Grace Church, New York. It is 11ft. lower than the Bunker Hill shaft at Boston. It would hold the Vendome Column mounted on a 74ft. pedestal. The seating capacity of the building is estimated at over 200,000 people. St. Peter's, at Rome, holds about 54,000; St. Paul's, in London, less than 20,000, and the Metropolitan Opera House in New York has a capacity of 5,000 people. The entrances of this building are 40ft. wide and 80ft. high. Its ground plan is much more than twice the size of the Pyramid of Cheops—and so on; but this sort of thing gets wearying.

The L.C.C. look well after theatres as touching any danger of fire and panic. A correspondent of the *Fall Mall Gazette* asks when this authority will look after Exeter Hall. The place is said to be a regular trap. The two doors at the ends of the corridors beneath the galleries *open inwards*—fact astounding and incredible—and these galleries, writes the correspondent, were crowded to excess at a meeting the other evening.

I like analogies. Mr. A. Braxton Hicks, coroner for the Battersea district, as president of the Battersea Amalgamated Evening Classes Swimming Club, said, the other evening, that though the lads were beginning to swim in style, they must remember that the great thing needful is to swim, independently of style. This is excellent. Many persons might remember that the same reasoning applies to design. The great thing wanted is, after all, the building. Often we have plenty of style, and precious little house.

Near Worthing is the interesting old church of Broadwater. It is, doubtless, well known to very many, being in such close proximity to a favourite seaside resort. I had never visited the building until a few days ago. A most peculiar feature is the arch of the crossing opening into the nave. In form it is Early English, in mould and enrichment most beautiful Norman work. It is said to have been formed out of the voussoirs of a round arch, which fell down. The arch opening into choir is an irregularly depressed round arch. I wish enthusiastic

amateurs and archaeologists would refrain from stuffing credulous parish clerks with nonsense respecting these irregular-shaped Norman arches. Our good friend at Broadwater has had someone endeavouring to enlighten him in this way. The fact of the matter would seem to be that circular arches get easily out of shape, and therefore some few years having elapsed since Norman times, many of the arches of 12th-century architecture have become depressed, and thrown up at the haunches. I know that some people hold peculiar views on this subject, and they have now an opportunity to back up their theories in these columns. Personally, I give the Normans credit for being common-sense builders, with an eye for fitness and order, and prefer to consider them superior to the architectural vagaries with which some would saddle them. GOTH.

PRECIPITATION WORK AND SEWAGE DESTRUCTORS AT SOUTHAMPTON.

THE sewage precipitation works at Southampton, carried out from the designs and under the supervision of Mr. William B. G. Bennett, borough engineer and surveyor, are very complete. Messrs. Manlove, Alliott, Fryer and Co.'s refuse destructor has been adopted for destroying the ashbin contents and garbage of the town. This has six chambers or furnaces, each burning eight to eleven tons of garbage a day. The sewage sludge is also transmitted to the destructor from the two reservoirs on the town quay, each of these being 100ft. by 60ft. and 10ft. deep, into which the sewage of a part of the town flowed by gravitation, being discharged at low water. Two of Shone's pneumatic ejectors have been brought into operation to render independent of the tide the discharge of the effluent from the reservoirs, and to raise the low-level sewage into them for treatment. These ejectors are worked by power obtained from the destructor. One of these (36 gallons) is placed below the reverts of the low-level sewer, and serves for transmitting the sludge from the reservoirs to the destructor, as well as for raising the sewage from the same sewer. Another of 700 gallons capacity is placed in the east reservoir for discharging the clarified effluent into the Southampton Water. A third ejector deals with the sewage of another district. Precipitation of the sludge is obtained by the use of ferrozone supplied by the International Water and Sewage Purification Company; it is mixed with enough clean water to make the whole into a stiff paste, which is led through a shoot into a box with perforated sides placed in the sewer, the sewage flowing past washing the ferrozone gradually out of the box. The sludge is mixed with road sweepings or sorted refuse at the destructor, and is turned out as good manure, which is sold at 2s. per load at the works. The amount realised from the sale, and for the supply of compressed air to other ejectors in the neighbourhood during last year, is stated to be £600. The products from the destructor, concrete slabs, clinkers for concrete foundations, and fine ashes, represent about £300. The waste heat from the destructor is used for producing electricity. We have gathered these facts from a paper read before the Institution of Mechanical Engineers at Portsmouth by Mr. Bennett, which contains full details of the ejectors, reservoirs, and destructor, and which is of interest to borough surveyors.

Mr. M'Kenzie, of the firm of Messrs. Matthews and M'Kenzie, architects, Aberdeen, again visited Balmoral on Saturday, and submitted to Her Majesty plans for the proposed new church at Crathie. The Queen was pleased to approve of the plans, and to give them her final sanction. The design of the church is Gothic of an Early Scottish character, resembling in many respects the church of St. Monance in Fife. The south transept will be reserved for the accommodation of the Queen and the Royal Family, and will have a separate entrance.

The Queen's-road Board School at Leeds was opened on the 28th ult. It is on the central hall plan in three departments. The two central halls each measure 77ft. 6in. by 32ft. The classrooms are 16ft. high, and hold 60 scholars each. The total accommodation of the school, inclusive of the central halls, is for 1,236 scholars. The building is built of brick, with stone dressings, and is in the Italian style. The schools have been designed by Mr. William Landless, of Belmont-grove, Leeds. The cost of the site was £2,281 6s. 6d., and that of the buildings and fittings about £12,880.

NOTES FROM PARIS.

THE summer holidays are now rapidly drawing to a close, and those who have been fortunate enough to have left for a time the bustle of affairs in this great city are now thinking of returning to serious work.

As far as the younger aspirants to the architectural profession are concerned, work is already beginning in good earnest; the vacation is over, and those who have been clever enough to have passed the entrance examination of the *Ecole des Beaux Arts* are settling down to the winter's study in one of the various school studios. The private class studios for painting and modelling are rapidly filling up; the evening classes are in full swing, and those English and American art students who have been visiting their homes or doing a trip to classic lands have returned, are putting to rights their own studios, sorting out their studies, and anxious to start on the picture which each one hopes will get a place in the Salon or Academy of next year.

A visit to the studios of the Latin quarter—those large private studios which take their turns as working-room, living, and bedroom, and even drawing-room when occasion calls for it, is most interesting. On his return to work each artist, as a rule, makes a round of visits to his friends' studios for a hand-shake, and a pertinent inquiry as to the ideas of his brother brush for his next great attempt. Some of them work very hard, beginning betimes in the morning until sundown, and then, after dinner, working at one of the class studios for drawing and modelling and life studies. The communal schools are crowded every evening with young fellows, artisans and others, drawing from the model, plaster, or life, or busily working out designs in clay or wax. These classes are free to all, good professors visit them, and a great deal of excellent work is done.

At the *Ecole des Beaux Arts*, the young architectural students who have just been received at the school, and have chosen one of the various studios, are working hard at the elements of architecture, and trying each one his best to carry off a medal or mention at the monthly competitions. They often begin very well, eagerly following the theoretical lecture, and studying hard at the elementary drawings. But, as often, their zeal gradually dies away—first a lecture or two is missed, afterwards many; the monthly competitions are often done hurriedly and at the last moment. In fact, complaints are being made that too much liberty is allowed at the schools, the student working more or less as he pleases. It is true that he would have to work very hard if he wished to follow all the lectures and drawing studies, for many of the younger ones, who may have little or no resources from their homes, are forced to “faire la place,” as it is called, or work for a portion of the day or week at one of the business offices, in order to add to the funds necessary for them to follow their studies and live the student life. The subject of the school study compared with the apprentice or pupil system is at present very much under discussion. Each, evidently, has its merits, and each its disadvantages. The apprentice or pupil who works entirely in an architect's business office has not enough opportunity to pick up ideas—not enough time, unless he is an ardent worker during spare hours, to get up studies and designs for himself. He then often falls into a groove of ideas—he sees only the style special to his master, and thus lacks the readiness and quickness of design so necessary for pressing work. But, on the other hand, he often sees good practical work, has occasional opportunities to visit the buildings during construction, copies or makes out specifications, &c., and follows the general run of the business office.

The student who confines himself wholly to the school studies has perfect liberty, and, if he be studious, will be always present at the different lectures and classes, and work up for the examinations thereon. He works at the drawing studies, either in getting up designs of his own or emulating his fellows in the monthly and fortnightly sketch competitions. He has an opportunity of seeing the designs of his fellow students, the many ideas and styles worked out, is looked over by a good professor, receives and imparts ideas—in fact, goes through the course of mutual teaching in vogue at the studios. But if he is a hard worker, and cares to add to his practical knowledge as well as to his purse, he may work during spare time at an architect's office. He rarely takes a fixed berth; but works

here and there at odd jobs—competition and other work; the payment, as a rule, is by the hour.

Building operations are being carried on to an immense extent at Paris this year, and Parisian architects have not been able to complain of lack of work. To the west of the city the number of buildings put up is remarkable. The immense “immeubles,” or houses let on the flat system, are being rapidly built in this quarter, and how different the style from that of only a few years ago! These massive six or seven-story structures are most imposing, and form the type special to the Paris boulevard or street. The exterior is decorated with a large amount of judiciously placed carving, designed and executed by an artist hand. Mr. Buggins would find very little to do at Paris; his jerry-built, uninteresting work would not suit the public taste. All the modern improvements are introduced into these new houses; the staircases are large and well lighted, and lifts are being extensively used; the floors are always constructed of iron rafters filled in with brick and plaster, and the latest sanitary appliances are employed. A great feature in the exterior of the building is the large square bay window, wholly of iron, with casements filled in with coloured glass. These bays generally mount from the first floor to the topmost story. Mosaic panels and coloured tile decorations form also a special feature. The style of architecture generally seen has become more free for these kinds of buildings; the façade looks massive. The broad pilasters, with well carved capitals and broadly-treated sculptured panels and keystones, make an imposing effect.

The question of sanitary improvements is beginning to occupy a place of great importance at Paris. As a rule in this city, or until a very short time ago, the system of water-flushed drainage is very little employed. The water-tank in the closet is unconnected with any water service, and has to be filled by hand from time to time, and, through neglect, is often left dry. The soil-pipe descends to the basement, allowing the soil to fall into a covered cistern, from whence the matter is pumped at fixed times into airtight vans, and carried away. A certain fee is payable to the company which does this work. If too much water is used to flush the closets, and the cisterns are left full too long, they overflow and inundate the foundations with the poisonous matter, forming, in time, a good lurking-place for infectious diseases. But lately the *tout à l'égout*, or drainage system, has been introduced, the drains carrying away the matter to the river. Only 6,500 houses in Paris employ this system at present. It appears that over 250,000 cube yards of refuse matter is thrown daily into the Seine, turning the river into a perfect drain. Complaints come daily from the sanitary authorities and proprietors of the villages and lands below Paris, setting forth that the river water has become perfectly poisonous and dangerous to the health of the inhabitants of the villages on the banks. A scheme is therefore being discussed to drain the matter from Paris by a system of flushed drains into the country as far as Acheres, where it will be converted, and sold or employed as manure and other purposes. The question of drainage as far as the sea has been renounced as being too costly.

Visitors to the Louvre will have noticed for some time past the heavy scaffolding which encumbers the grand staircase leading to the first floor. This has now been taken away, although the work intended to be done is by no means completed. The intention was to decorate the staircase with marble panels, and to cover the six vaults of the dome with mosaic, representing Antique Art, Middle Ages, Renaissance, and Modern Art. From 1884-87 the mosaists worked at the Renaissance design, containing four large figures and medallions of Poussin, Raphael, Rubens, and Albert Durer. The antique art was then commenced, and should have been completed in time for the 1889 exhibition, but even now it is not far advanced. As, however, the work seemed to continue indefinitely it was decided to remove the ugly scaffolding; the panels of the work remaining to be done will be put together in the studios and then rapidly put into place. Visitors to the Louvre have now the opportunity of admiring the costly work already in place.

They are already talking of the proposed exhibition for the year 1900 at Paris. The site proposed for the buildings is the plateau of Courbevoie, some little distance outside the walls to the north-west of Paris. This was one of the sites proposed for the last exhibition, but for

many reasons it was not thought suitable at the time. Railway and other communication will afford an easy access to the exhibition from the city, and also to the Champ de Mars, where the buildings remaining from the last exhibition will be utilised for minor objects. Ingenious minds are trying to think of a new “clou,” or special attraction, such as was the Eiffel Tower. Certain astronomers propose to construct an immense telescope or mirror which will, they say, bring the moon to apparently a yard or two of the earth. Another idea is that of an immense waterfall, resembling, and even surpassing, Niagara in magnificence. But in the eight years that are before us before 1900, many new inventions may have changed the course of ideas.

The ruins of the Chateau of St. Cloud, so well known to English tourists, are rapidly disappearing before the attack of pick and shovel. These historical ruins, which have become an eyesore to the Parisians, will be replaced by magnificent gardens. The existence of former buildings on the site of the present chateau may be traced back to a very early period in the history of the country, and, like Versailles, some portions of the ancient buildings are preserved in the midst of the later construction. The last building, the present chateau, was completed, as far as the exterior is concerned, about the year 1680. The architects of the time, Lepautre, Girard, and Hardouin Mansart, took part in its execution for the Duc d'Orleans, brother to Louis XIV. Later on it was given by Philip d'Orleans to Marie Antoinette. Napoleon III. made it the summer summer palace of the court. In 1793, during the Revolution, it was declared public property. In 1815 the Prussian Blücher held there his corps de garde. From the chateau the declaration of war against Prussia in 1870 was declared, and on the 13th October of the same year, a fire, originated no one knows how, left the chateau in about the state in which it was in when given over a short while ago to be demolished. St. Cloud will lose a series of picturesque and interesting historical ruins.

ARTHUR VYE PARMINTER.

THE CLEANSING AND VENTILATION OF SEWERS.

AT a meeting of the Society of Engineers, held at the Town Hall, Westminster, on Monday, Mr. Joseph William Wilson, junr., President, in the chair, a paper was read by Mr. B. A. Miller on “The Cleansing and Ventilation of Pipe Sewers.” The author having mentioned the difficulties which had been experienced in many towns sewered on the combined system, owing to the road detritus being washed into the sewers through inattention to gully cleansing, drew attention to the necessity of constant flushing to prevent the generation of sewer gas, due to the decomposition of deposited matter. He then compared the system of combined and separate sewerage, giving the following reasons for preferring the latter:—Smaller sewers are required; surface water drains need not be laid as deep as sewers; the exclusion of surface water gives less liquid to deal with and be treated; there is greater regularity in the flow, enabling the size of sewers to be calculated more accurately; the sewers, being smaller, afford less space as gas-holders, and require less water to flush. He recommended the admission of roof-water into the sewers. He then alluded to flushing, giving the different methods employed. The use of penstocks or plugs, causing the sewage to back up, he considered unsatisfactory, as deposits are left in the pipe to decompose. In preference he advocated the adoption of flushing chambers, containing automatic siphons, mentioning those of Messrs. Doulton, Rogers-Field, Adams and Palmer, and proceeded to describe the action, giving preference to those with a deep trap. Passing to the question of ventilation, he enumerated the different methods employed for ventilating sewers, describing first the usual methods by shafts from the sewer to the street level, with open gratings in the roadway, intended to act as outlets and inlets, but which were often an annoyance owing to the irregularity of their action. The Holman-Keeling sewer gas destructor was considered effective, though costly, and he suggested the erection of iron shafts, either open at the top or provided with cowls, which could take the place of street lamps, placed on the line of kerb, and connected with the sewer. The author then gave a description of a

series of experiments taken in one of these shafts at Beckenham, with a view of ascertaining the advantage of ventilating sewers by ventilating lamp-posts, as compared with the ordinary method of gratings in the roadway. A series of tables and charts showed that the best results were obtained when the street ventilators were open, and, further, that the direction of the wind was the chief agent which influenced the movements of sewer air in the shaft, the temperature also affecting it under certain conditions. He recommended, in order to keep sewers in their proper state, periodical flushing by automatic chambers, and an efficient method of ventilation by ventilating-posts, which would produce a better current of air in the sewers than is obtained by the ordinary methods of street openings alone.

OBITUARY.

M. ERNEST HENDRICKX, of Brussels, one of the leading architects of Belgium, died unexpectedly at the close of last week. He was a professor at the Free University of Brussels, and at the industrial school in the same city, and also lectured regularly in the School of Arts and Design at S. Josse-ten-Noode. Only a few days before his decease M. Hendrickx was announced to have won the competition for the construction of the chief entrance to the Palace of Justice at Brussels.

Mr. William Sinclair, builder, of Lerwick, died on Friday afternoon in his sixtieth year. A native of Shetland, he served his apprenticeship to the joiner trade in Edinburgh, and wrought there as a journeyman some years. In 1860 he returned to Lerwick, and had since carried on business in partnership with Mr. John Hardie, the firm being known as Sinclair and Hardie.

COMPETITIONS.

KEIGHLEY.—The town council of Keighley received and adopted on Tuesday a report by the hospital committee as to the plans submitted in competition for the proposed infectious diseases hospital to be built at a cost not to exceed £4,000. The institution was to provide separate and isolated departments for typhoid fever, scarlet fever, and small-pox patients, with administrative block, and the usual out-buildings. A large number of designs were sent in, and that submitted by Messrs. Judson and Moore, of Keighley and Bradford, was selected.

SOUTHWARK.—The library commissioners of the parish of St. Saviour's, Southwark, having examined the designs sent in by competition for the new public library, have decided on that by Mr. John Johnson, of Queen Victoria-street, E.C. All the designs sent in for competition will be on view to the public from to-morrow (Saturday) until the following Saturday, at the Vestry Hall, Borough Market.

The first of the fourteenth course of lectures to sanitary officers was given at the Sanitary Institute on Tuesday evening by Sir Douglas Galton, on "Ventilation, Warming, and Lighting."

The additions to Mason's College, Birmingham, made at a cost of £20,000, have been opened this week. They consist of medical schools, and have been carried out from designs of Messrs. Cossins and Peacock, of that city. Messrs. W. and J. Webb, also of Birmingham, are the builders.

A cheque for £200,000 was, on Wednesday week, ordered by the Ipswich Corporation to be signed in favour of the Directors of the Ipswich Water Works Company, and on the following day the undertaking was formally transferred to the Corporation.

The reflooring of the nave of Manchester Cathedral is now proceeding rapidly under the direction of Mr. Crowther, the cathedral architect, and it will be so near completion by Sunday week, October 16, that the nave will be reopened on that date for public service.

The new schools at Dame Margaret's Home for Waifs and Strays, Washington Hall, were opened by Sir Lowthian Bell on Monday. The laundry at the Hall has been rebuilt, with the result that a large school and suitable classrooms have been provided at the Home. There will be accommodation in the school and classrooms for 120 scholars. At present there are 81 poor children in the Home. The building has been completed, from designs by Messrs. Plummer and Burrell, of Newcastle-on-Tyne, by Mr. Hunter, builder, of Washington, Co. Durham.

ARCHÆOLOGICAL.

KIRKSTALL ABBEY.—The *Leeds Mercury* says the work undertaken by the Leeds Corporation with a view of preserving this historic ruin is being steadily carried out. It was found that many portions were in an extremely unsafe condition. The services of Mr. J. T. Micklethwaite, F.S.A., of London, were secured, and the work of strengthening the walls was commenced in May, 1891. To erect new walls or pillars, or to replace the vaulting, was not the object which either the Corporate Property Committee or the architect had in view. While desirous of strengthening, they were strongly opposed to depriving the ruins of any of their historic interest. The instructions given to the masons were not to use a single new stone if they could possibly avoid it, but to utilise all the old material lying about the structure. The groining of the south aisle and the adjoining walls have been restored, all the defective joints having been filled up with concrete. A large amount of rubbish has been removed from the north transept, and beautiful features of the fabric have thus been brought to light. Among the rubbish were found many fine pieces of masonry, some of them in a remarkably good state of preservation. One capital discovered appears quite modern, the outline being almost as sharp as it would be on leaving the hands of the carver. A considerable portion of the north aisle was demolished by the fall of a portion of the tower. To strengthen the part of the wall standing, and to increase the stability of the walls of the north transept, two pillars are now being erected. The walls of the north transept have also been tied with wood, and all the joints cemented, so that now this portion of the abbey is perfectly safe, and likely to remain so for many generations. Nothing is at present being done to the tower. The corporation would like to do something to strengthen it, but they foresee the difficulty of erecting scaffolding in such a position, and of doing what else is necessary. At present, however, little fear is entertained as to its safety. The adjoining walls appear to be in good condition, and a stiff breeze would be required to do any damage. A gale from the north-west would be the most dangerous, as the angle faces in that direction. During the frost of last winter a part of the west wall of the cloister fell. This has now been rebuilt with the old stone. With a view of preserving the east vaults, a layer of asphalt has been placed over them. One of the supports of the ancient staircase leading from the cloister to the dormitory gave way last spring. This has been replaced and strengthened with brickwork. This is the only instance in which new material has been used. Nothing, as yet, as been done to the east end of the chapter-house, but it is probable that the top will be strengthened with asphalt. Complaints have been made about the removal of the ivy and foliage from certain parts of the ruins. This has been totally unavoidable.

ROMAN REMAINS IN CUMBERLAND.—The Cumberland and Westmoreland Antiquarian and Archæological Society recently visited Hardknott Castle, in Eskdale, Cumberland, to inspect the excavations which have recently been made, under the supervision of Chancellor Ferguson, F.S.A., president of the society; the Rev. W. S. Calverley, and Mr. C. W. Dymond, by which the principal features of the Roman camp there have been revealed, and a number of Roman relics discovered. Hardknott Castle, which is referred to in one of Wordsworth's sonnets as "that lone camp on Hardknott's height, whose guardians bent the knee to Jove and Mars," is about three miles from the well-known hostelry, the Woolpack Inn. The President read a paper, in which he described some of the scenes which would have presented themselves to the eyes of a traveller during the Roman occupation on his arrival at the top of Hardknott Pass, 1,290ft. above the level of the sea. He pointed out the Roman parade-ground, now locally designated the bowling-green, on account of its level surface, and described other features of the Roman camp. The camp, he said, covered between three and four acres. The south-western gateway was covered by a natural mound or traverse of rock, the gate itself being probably double. The north-west gate was a single gate, the total opening, 10ft., being only about half that of the other three gates. As it opened almost immediately upon a precipitous cliff, it was probably little used, except for the relief of sentries and for the barrack labourers to carry

out the camp refuse daily, which was pitched over the cliff, as they knew was done at the Roman camp at Maryport. A little search at the bottom would probably reveal the kitchen midden and refuse-heap of the garrison, and they hoped to find it next summer. The north tower stood on a rocky knoll, and occupied much the highest part of the camp. The towers consisted of a basement of stone, perhaps used as storehouses; the upper portions were probably of wood. The north-east gate was a double gate, and was 19ft. 7in. in the opening. He described the buildings within the camp—the forum, which had been cleared out sufficiently for the whole plan of it to be recovered; the eastern group of building, comprising the barracks; the western group, which probably contained a stable with harness-room. They found no prætorium, or quarters for the commanding officer; but it was evident from the poverty of the relics that no officer of rank was here in command, probably no one above the rank of a centurion. A large area of the camp had no buildings; there might have been wooden huts to shelter troops marching through, or they might have encamped on the parade ground. The castle, with its walls, gates, and towers, must have been a picturesque feature in the scenery of Eskdale. The excavations which had been made in the camp had revealed pottery, bones, glass, lead, iron, bronze, flint, and charcoal, generally in fragments. Outside the camp, near the road, Mr. Calverley had unearthed a circular building of 15ft. internal diameter, still standing about 4ft. high, with a door approached by a ramp from the road. This building bears a striking resemblance to the famous building on the Carron, in Scotland, known as King Arthur's Oon, now destroyed, and, like it, would have a beehive roof of stone. The president thought that this had been a temple, and contained the image of some god or goddess patron of travellers. Close to this temple Mr. Calverley has found the ruins of a three-roomed house, with hypocausts, and also a bath. Behind the house a reservoir had been formed by damming up the stream. The president conjectured that this was a wayside tavern, for the refreshment of travellers.

CHIPS.

A new marble font was last week dedicated in the parish church of Lyndhurst. It has been executed by Mr. G. W. Seale, of Brixton, who has done nearly all the carving which enriches the interior of the church, the architect being Mr. J. L. Pearson, R.A. The cost of the font was £170.

An adjourned meeting of the Gateshead School Board was held on Friday to decide on certain matters in connection with the proposed Shipcote School. On the question of plans for the school, the Rector moved that the appointment of architect and the selection of plans be decided by open competition. To this an amendment was moved that Mr. Dunn, of Newcastle-on-Tyne, be appointed architect. Four voted for the amendment and four against. One member did not vote, and the chairman declined to give his casting vote, so the matter stands over.

A new Foresters' Hall, adjoining the Railway Hotel, at Woolston, Southampton, was opened on Wednesday week. The chief room measures 58ft. by 26ft., and adjoining are bar, committee-room, and lavatories. Mr. W. H. Chapman, of Woolston, was the builder.

At Great Salkeld parish church, near Penrith, a new Cambridge quarter clock, showing the time upon one external skeleton dial, painted and gilt, 4ft. 6in. diameter, with copper hands, painted and gilt and balanced within, has just been erected. The makers are Messrs. Potts and Sons, clock manufacturers, Guildford-street and Cookridge-street, Leeds, makers of the Penrith parish church clock; and chimes, and the Carlisle Corporation Markets large clock and bell.

The fourteenth annual festival octave, in commemoration of the reopening of Tewkesbury Abbey in 1879 (after restoration from Sir Gilbert Scott's designs), took place last week. This year's commemoration gains special significance from the fact of the abbey having of late received many most elaborate and costly gifts. An oak chancel screen has been erected by Archdeacon Robeson, and last week Messrs. Hardman and Co. completed the erection of five stained-glass windows, with Scriptural subjects, in the north aisle of the nave. The sculptured doorway leading from the nave into the cloisters, the restoration of which was undertaken by Mr. T. Collins during the year he was Mayor of Tewkesbury, has also just been completed, and several other stained-glass windows (not yet erected) have lately been promised to the abbey.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

SOCIETY OF ARCHITECTS.—The meetings of this Society for 1892-3 have now been fixed as follows:—Nov. 15th President's address, Nov. 29th, December 13th, January 10th and 24th, February 14th and 28th, March 14th and 28th, April 16th, May 16th, and June 20th annual meeting.

THE GLASGOW INSTITUTE OF MEASURERS.—The twelfth annual meeting of this institute was held in Glasgow on Monday, Mr. Robert Scott, president, in the chair. Reference was made to the Building Regulations Bill, which the council had considered in detail, and reported upon in a memorandum of suggested modifications. The scheme of professional examination, for which twenty-eight candidates had entered, was postponed till next year. The office-bearers for the ensuing year were elected as follows:—President, William Howatt, 146, Buchanan-street; vice-president, John H. Ramsay, 194, St. Vincent-street; secretary and treasurer, Colin Young, 113, West Regent-street; auditors of professional accounts, Messrs Robert Scott and John Muirhead. Other members of council are:—James Howatt, John Danskin, James D. Herbertson, Alexander Knox, John Morrison, Robert Reid, and John Currie.

LIVERPOOL ARCHITECTURAL SOCIETY.—The first meeting of the session took place at the Royal Institution on Monday evening last, when Mr. T. Harnett Harrison, F.R.I.B.A., gave his opening address, which took the form of a disquisition on climatic influence on art. He pointed out that art reached its greatest perfection amongst the nations inhabiting the Temperate zones, and advanced the theory that people who experienced hardships and difficulty in providing the necessities of life were too much occupied in attending to the "first law of nature" to care much for the merely beautiful. This is the first part of a paper to be finished at the last meeting of the session, when the author will, no doubt, point a practical lesson as the outcome of the original line of thought he has taken. The society is active in pushing forward education, and has arranged for students' classes, when lectures will be given on Thursday evenings during the months from October to March inclusive, on the following subjects:—"Stresses in Structures and Shoring," James Dod; "History of Architecture," H. W. Keefe; "Building Construction," David Lyon; "Specifications and Quantities," H. L. Beckwith, F.S.I.; "Mouldings, Features, and Ornaments," C. E. Deacon, F.R.I.B.A.; "Sanitation," T. Harnett Harrison, F.R.I.B.A. These lectures are free to all members of the society, and as a direct result of their formation, a considerable accession of new members has taken place.

MANCHESTER.—The first sessional meeting of the Manchester Society of Architects was held at the Literary and Philosophical Society's Rooms, George-street, in this city, on Tuesday evening, the president, Mr. Salomons, in the chair. Mr. F. W. Bedford, A.R.I.B.A., read a paper on "Some Account of the Arts in Sicily," which was illustrated by lantern views and sketches. He lightly touched upon the remains of Greek temples of the Dorian colony, and chiefly devoted his remarks to the Christian architecture. Illustrations were given of the interiors, showing, besides the varied marbles and sculptured work, the beautiful mosaics covering the walls and in some cases the ceilings of the churches and cathedrals, amongst the number being those at Palermo, Monreale, Cefalu, &c. The lecturer pointed out that it was only through these buildings that we could judge whether polychromy by opaque pictures in mosaic or by translucent pictures in the glass of our stained windows is the more beautiful mode of decorating an interior. A very large and admirable collection was exhibited of drawings made during a year's tour in Italy by the lecturer as Owen Jones Travelling Student of the Institute. A hearty vote of thanks was accorded to Mr. Bedford for his excellent and valuable paper.

The London County Council resolved on Tuesday to take the necessary steps for the purchase of the North Metropolitan Tramways. Amendments calculated to delay a decision, and to provide that the Council should not work the line if it was purchased, were negatived, and the original proposal was carried by 92 votes against 24.

Building Intelligence.

BRADFORD.—A new church, to be dedicated to St. Clement, is being built at the junction of Gilpin-street and Barker-end-road, Bradford, as a family memorial of the late Viscountess Mountgarret. It will be Perpendicular in style, and will seat between 600 and 700 persons. The nave will be 88ft. by 23ft., exclusive of north and south aisles, and 12ft. in width, and covered by an open-timbered roof. The chancel will be 62ft. in length, and adjoining it will be vestries and an organ-chamber. The external work will be of rubble from Idle, and the interior walling of red Cumberland sandstone. The flèche of oak will rise to a total height of 98ft. The internal paving is of wood blocks. Mr. E. Prioleau Warren, of Westminster, is the architect, Mr. Sutton the clerk of works, and Messrs. Wheeler Brothers, of Reading, are the contractors. The outlay will be about £12,000.

CAMBERLEY.—The memorial stone of the new church of St. George at Camberley, Surrey, was laid on Michaelmas Day. The site is at the termination of Obelisk-road, leading to the Knoll-road. The style adopted is Early English. The nave will be 68ft. by 26ft. The chancel will be 32ft. by 23ft. There will be a vestry and organ-chamber, 15ft. 6in. by 11ft. 6in., on the north side of the chancel; a clergy vestry will be added at a future date. The height of the nave, under the ridge, will be 47ft. 6in., and to the wall-plate 23ft. The narthex at the west end, in which is the principal entrance and a baptistery, opens into the nave by triple arches. The material will be brick, with dressings of Ham Hill stone. The church is to be lighted by single and double lancet windows and a five-light window in the chancel. The wood flèche to contain the bell is 31ft. above the ridge. The paving is to be wood-block throughout. The architect of St. George's is Mr. Arnold Hoole, and the builders are Messrs. Norris and Sons, of Sunningdale.

FOLKESTONE.—On Sunday last services were for the first time held in the new school-chapel, which has been built at The Grange, Folkestone. The walls are of red local brick throughout, with corbels, copings, and crosses of Morley red-stone. The seats, which are in oak, face east and west—the apse of the chapel facing north—and are arranged to accommodate 72 boys, 6 masters, and 32 visitors. The roofs are of pitch-pine, and are covered with local tiles. The architect is Mr. Arthur Blomfield Jackson, of London, under whose direction the work has been carried out by Mr. H. R. Mercer, of Folkestone.

IPSWICH.—The new premises of the Young Men's Christian Association in Tavern-street were opened on Thursday in last week. The old Bank House in the main thoroughfare of the town has been purchased for £3,600, and has been altered and added to at a further cost of £1,450. The chief room on the first floor is 48ft. by 19ft., and is seated for 200 persons. The frieze is decorated with a free design, representing flying storks, designed and executed by Mr. Bertram Binyon, a nephew of the architect. Other rooms include reading-room, committee rooms, and a suite of ladies' rooms. The old garden at the rear of the premises has been left, and will be used as a lawn-tennis court. Adjoining is a new gymnasium of red brick, 52ft. by 28ft. The alterations have been carried out by Mr. F. Bennett, from the plans of Mr. Brightwen Binyon, F.R.I.B.A., of Ipswich, the honorary architect.

KIRKCALDY.—The new public park at Kirkcaldy was opened on Saturday week. The area is about 108 acres. There are some handsome entrance gates, and the lodge is a highly ornamental one. A noble-looking bandstand occupies a prominent position on the rising ground a little above the lake, and has been erected by Messrs. Steven Bros. and Co., of 4, Upper Thames-street, E.C. It is constructed of cast iron on a raised stone base, and is of very ornamental design. It is octagonal in shape, surmounted by a dome of high pitch resting on eight columns with floriated capitals, and having ornamental brackets supporting the beams, which are of very elaborate scroll-work. Each bay in the octagon is filled in with a very handsome scroll-work railing, in the centre of which is the Kirkcaldy coat-of-arms. The various points are finely brought out by the free application of gold and colours, the town's arms being of gold on a blue

shield surmounted by the motto "Vigilando Munio," also in gold.

NEWCASTLE-ON-TYNE.—The foundation-stone of the Rutherford College was laid in Bath-lane on Wednesday. The building will have a frontage of 120ft., and will consist of basement, ground floor, and first, second, and third floors. In the basement will be dining-rooms for boys and girls, metallurgical laboratory, &c. On the ground floor is the large examination and assembly hall, 63ft. by 40ft. This will have a gallery and a platform. There are also, on the same floor, a physics lecture room, 42ft. by 26ft.; a second physics lecture room, 40ft. by 20ft.; a physics laboratory, 61ft. by 20ft.; a preparation room, 20ft. by 16ft. 9in.; a small optical room, master's room, lavatory and cloak room, &c. On the other side of the corridor, there are a committee room and registrar's room on one side of the lobby, and, on the other side, a library and reading room, 51ft. 10in. by 20ft. The assembly hall and physics lecture room run up through the first floor, the gallery being on a level with the first floor. There are, besides, on the first floor, six classrooms. On the second floor, the central space is occupied by the lights of the assembly hall. On three sides of this are the following rooms:—Still life room, antique room, master's room, general cast room, model drawing room, and an elementary art room. On the other side of the corridor are:—Modelling room, building construction room, and machine construction room. On the third floor are the following:—Chemistry lecture preparation room, chemistry lecture theatre, two small dispensaries, teacher's room, elementary chemistry laboratory, balance room, honours chemical laboratory, organic combustion room, biology preparation room, physiology preparation room, and a physiology and biology laboratory. The tower will be used as an astronomical laboratory. Messrs. Oliver and Leeson, of Morley-street, Newcastle, are the architects. The whole contract for the building has been given to Mr. Alexander Pringle, of Cramer Dykes, Gateshead. The ventilation will be on the Plenum system, the air being forced into the building instead of extracted. The air is warmed, and, if deemed well, disinfected at the basement, and forced by means of engine and fan into the different parts of the building. It is proposed to supply 1,500ft. of cubic air per hour, warmed to the requisite temperature, and filtered through a watered screen to each student. The cost of the college will be £15,000.

PRESTON.—The ceremony of laying the foundation-stone of the North and East Lancashire Deaf and Dumb Schools, Preston, an institution which owes its existence to Miss Cross, of that town, was performed on Saturday by the Earl of Lathom, with full Masonic ceremonial. The site is in the Blackburn-road. The building will provide accommodation for fifty children, but the plans are so arranged that, should the necessity arise, the accommodation can be doubled at comparatively small cost. There is provided on the western side a boys' wing, with a large day-room 23ft. 6in. by 18ft., teachers' rooms being placed at either end. In the event of extension these latter will be removed, and the length of the room will then be 36ft. A wing for the girls is placed at the east side of the buildings; the accommodation provided is not so great as that for the boys. The governor's residence is placed in the centre of the buildings, and there is also a board-room, together with a sick ward and a block where the administrative work of the schools will be carried on. The plans have been prepared by Messrs. James and Green, architects, of Blackburn, and the cost of the present section of the work is estimated at £5,200.

SALFORD.—The foundation-stone of a technical school for the borough was laid on Saturday. Mr. Henry Lord, of Manchester, formerly a member of the Salford Town Council, prepared the designs for the school. Messrs. Wilson and Toft, builders, City-road, are the contractors for the foundations. The building is set back a short distance from the street, and its main front stretches northward into Peel Park for more than 300ft. It is to be of red brick and terracotta, and will be from 80 to 90ft. in height. Provision will be made for the teaching of physics, mechanics, engineering and the handicrafts associated with it, joinery, turnery, wood-working, plumbing, building construction, drawing, modelling, painting, spinning, weaving, dyeing, cookery, and some of the minor in-

A new edifice is being built for the accommodation of the treasures of the National Library of Florence. The new structure will be lighted by electricity, and will employ the telephone, elevators, and all modern aids to quick communication and delivery. It will have nearly four miles of shelves in a separate stack-room, in eight stories, averaging about 12ft. high. An ultimate capacity of 2,000,000 volumes is contemplated. The reading-room is about 40ft. by 70ft., with the desks and seats in amphitheatrical arrangement. The grand staircase will be adorned with a portrait fresco, "The School of Florence."

Legal.

CONTRIBUTORY NEGLIGENCE.

QUESTIONS of contributory negligence are especially common in cases of accidents of the kind that happen about buildings and the like. They constantly crop up in cases of Employers' Liability and in other similar claims. But contributory negligence on the part of the plaintiff will only be a good defence if it can be shown that but for his own negligence the accident would not have happened to the plaintiff. Indeed, it has been held that the defence of contributory negligence is of no avail unless the defendant can show that the plaintiff's negligent conduct was the proximate cause of the accident. There may easily be some negligence on the part of the plaintiff, which will not in any way affect his right to recover, and this, too, even although it may have indirectly aided in bringing about the accident, so long as it was not the active and proximate cause. In these cases much must depend upon circumstances, and subject to this general rule each action will stand on its own merits. Many defendants are apt to be over-hasty in thinking they have evidence of the plaintiff's contributory negligence, when all they can produce is something said at the time of the occurrence by the party injured, and who was in complete ignorance of the way in which the accident had happened.

A good instance of this can be found in the recent case of "*Bythesea v. Palace and Burlington Hotels Co., Ltd.*" (*Times*, 21st July). In this case the plaintiff sued for damages for injuries caused by the negligent management of a passenger lift at the hotel, and she recovered a verdict for £75. The defendant company now moved for a new trial on the ground that there was a clear case of contributory negligence, as admitted by the plaintiff herself at the time. From the fact it appeared that the occurrence took place on a Sunday evening at the Buckingham Palace Hotel, when the passenger lift was being worked by a relief man, who was not used to it. The lift was a small one, with only sitting-room for two. The plaintiff, with two other ladies, got in to go up to their rooms. The man in charge opened the valve, but finding there was not pressure enough for the load, he opened the door and asked one of the ladies to alight, forgetting to turn off the valve. The lady standing up got out, and the plaintiff was going to follow her, when the lift-cage, thus lightened, and the valve being open, it ascended, and threw her forward to the ground, causing injury. She said at the time to the man and others that it was entirely her own fault; but when it was afterwards explained to her how the thing worked, and that the accident had been caused by leaving the valve open, she brought this action. The Court of Appeal now held that there was no evidence of contributory negligence, for the plaintiff had spoken of its being her own fault in entire ignorance of the cause of the accident, which was clearly the man's negligence as to the valve.

FRED. WETHERFIELD, Solicitor.

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NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

LEGAL INTELLIGENCE.

WHAT IS A WAREHOUSE UNDER THE BUILDING ACT?—Messrs. Holland and Hannen, of Duke-street, Bloomsbury, were summoned before Mr. Vaughan, at Bow-street on Tuesday, by Mr. Frederick Wallen, the West St. Pancras district surveyor, for infringing section 27, sub-section 4, of the Metropolitan Building Act by erecting an additional building on the site of 40 to 43, Grafton-street, containing more than 216,000 cubic feet of air, and omitting to divide it by party-walls in such manner that the contents of each division should not exceed that number of cubic feet. It was explained for the prosecution that the premises were being built as an extension of those of Messrs. Shoobred, and constituted an infringement of the Act, not being a warehouse. He contended that a fireproof floor, by which the building was divided, was not to be constructed as a division like a party-wall. The lower part of the building would be employed in retail trade, and that above the fireproof floor as a dining-room and kitchen for the persons employed. Mr. Frederick Wallen said the building was approaching completion, and was

covered in. The top floor was a lavatory and scullery, and the second a kitchen. Then came a fireproof floor, below which were dining-rooms. The floor was made of iron beams and concrete, composed of coke breeze and Portland cement, and was 7in. thick. Over this was a tiled pavement 1½in. thick, and below a plaster ceiling. The remaining floors were ordinary floors of the same thickness. There were four openings in the fireproof floor, which appeared to be meant for lifts. The building consisted of six stories, in addition to a basement, giving a total height of about 88ft. The cubical contents of the whole building, without the staircase, were 272,800 cubic feet, the staircase representing 16,656 cubic feet more. The cubic contents of the part above the iron floor were 62,087 cubic feet. By Mr. Vaughan: The floor was not equal to a party-wall. A party-wall in this case should be 13in. thick, and, being built upright, gave support. In case of fire, the flames would act more strongly on a horizontal surface than on a perpendicular one. Mr. Grain, for the defence, contended that the building did not come under sub-section 4 of section 27, but came under the dwelling-house class, and that they were not bound to build party-walls. It was not in the warehouse class. It was admitted that it was being erected in conformity with the rules affecting dwelling-houses. There was no difference between it and a shop in which people lived over the place of business. Mr. Holland, architect, explained the construction and planning, stating that no floor contained 216,000 cubic feet of space. Mr. Ebenezer Gregg, Mr. F. A. Rooney, and Mr. Francis Chambers gave expert evidence as to the building being in the dwelling-house class. There was no limitation to cubic contents in that class. The Act defined all buildings as public buildings, warehouses, and dwelling-houses. This was neither a public building nor a warehouse, and must, therefore, be a dwelling-house. Mr. Dalby argued that this expert evidence was useless, as the sub-section spoke of any building used "wholly or in part for the purpose of trade and manufacture," and this was one. It was clear that a part of the house was used for the purpose of trade. The floor was not a party-wall. Mr. Vaughan: You can have a horizontal party-wall. Mr. Dalby thought not. The implication was that a wall was vertical.—Mr. Vaughan reserved his decision, and adjourned the summons for a fortnight.

IMPORTANT ARBITRATION AT EDINBURGH.—The proceedings in the arbitration between the Corporation of Edinburgh and the North British Railway Company in reference to the price to be paid for the land taken by the company from Princes'-street Gardens, were commenced on Monday in Dowell's Rooms, Edinburgh. Lord Shand is the overman; Mr. Dunlop, Westminster, the arbiter for the Corporation; and Mr. James Davidson, Saughton Mains, the arbiter for the railway company. The corporation claim payment of a sum of £150,000. In all probability the claim by the War Department will be dealt with at the close of the arbitration between the corporation and the railway company. The witnesses already heard include Mr. Cooper, borough engineer of Edinburgh; Mr. Vigors and Mr. Gerrard, land valuers, London; Mr. Dick Peddie and Mr. G. Washington Browne, architects, Edinburgh; Mr. McLaren, architect, Dundee; and Professor G. Baldwin Brown, Edinburgh University, who were all called on behalf of the corporation.

BUILDERS' LIABILITY FOR ACCIDENTS.—On the 3rd inst. a singular building dispute was heard before Judge Lumley-Smith and a jury at the Bow County Court, by which Frederick Challis, a builder's labourer, of Plaistow, sued Cornelius Mansfield, builder and town councillor, of Forest-lane, Stratford, to recover £50 for injuries sustained through the alleged negligence of defendant. Plaintiff's case was that on April 29th he was engaged by and with defendant to pull down an eight-roomed house at Maryland Point, Stratford; that three walls remained to be pulled down on the second floor; that defendant himself and a man named Salmons were assisting, when defendant took an iron bar, probed the bricks out, and the wall fell inwards into the room, instead of outwards into the garden, and the beams at the top fell on to the joists on which they were standing, which broke, and they fell to the basement floor, a distance of 15ft. He was picked up partly insensible, was unable to work again for fifteen weeks, and was not able to work properly now. Three witnesses corroborated, each swearing positively that it was the falling of the beams which caused the joists to give way. Defendant's version was that the beams were removed before the wall was unpinning, as it would be only suicide to attempt to knock down the wall whilst the beams were standing. The defendant could not be guilty of negligence, as he fell himself, and was laid up for five weeks. Four witnesses also swore positively that the beams were taken away the previous day, and that it was the weight of the fallen wall which caused the joists to break. They had knocked

down eight walls, and each of the others fell outwardly. The jury returned a verdict for plaintiff, damages £35. His Honour certified for costs.

IN RE R. YATES, OF SHIFNAL.—At the Madeley County Court on the 21st ult., Richard Yates, builder and contractor, Shifnal, was publicly examined as a bankrupt. The statement of affairs shows gross liabilities amounting to £6,376, of which sum £2,253 18s. 11d. is due to unsecured creditors. There are creditors fully secured to the extent of £3,603 17s. 2d., and others partly secured to the sum of £500. The assets are estimated to produce £275 18s. 11d., including £386 15s. for stock-in-trade and trade fixtures, and £1,313 4s. 3d. book debts, the deficit being £533 7s. 4d. Bankrupt succeeded his father in business at Shifnal in 1871. The liabilities connected with the concern which he took over reached £4,407, and the assets £4,326. The examination was adjourned.

INSUFFICIENT THICKNESS OF WALLS.—On Sept. 27 at the Lambeth Police-court, before Mr. Biron, Q.C., Mr. W. J. Goldsworthy, builder, was summoned at the instance of Mr. Ellis Marsland, district surveyor for Camberwell, for erecting in the Friern-road, East Dulwich, a three-story building, exceeding 25ft. in height, with walls only 9in. in thickness. The surveyor produced a section and photograph of the building, showing that the height to the top of the topmost story was 28ft. 2in., and that according to Part I. of the First Schedule, Table 2, of the Building Act, the thickness of the ground story should be 13in. On the part of the defendant it was urged that the rooms in the roof were only box rooms, but as one was 7ft. 6in. in height, and the other 9ft. 2in., and each contained a window and one a fireplace, the magistrate was clearly of opinion that the two rooms constituted a story, and made an order that the top story should either be removed, or the walls on the ground story made 13in. in thickness.

IN RE I. CRANSTON, OF ALDERSHOT.—Under the failure of Irvin Cranston, builder, of Aldershot, it appears that the gross liabilities amount to £2,660 13s. 4d., of which £1,131 7s. 10d. is due to unsecured creditors, to fully secured creditors £1,418 18s. 9d., the value of the securities being estimated at £1,850, thus showing a surplus of £421 1s. 3d. The total net assets are £867 19s. 1d., disclosing a deficiency of £313 8s. 9d. The debtor alleges his failure to have been caused through losses on contracts. The debtor states that he commenced business as a builder and contractor about thirty years ago with a capital of £20. He was in partnership with a Mr. E. Smith about two years ago in connection with a brickfield at Aldershot. The debtor's books are imperfectly kept, and there is no cash-book. The debtor states he only became aware of his insolvency last July, when pressed by creditors.

RE H. TOTEN, SONS, AND YOUNG.—Under the failure of these debtors, builders, of Gloucester-road, South Kensington, and Maude-grove, Fulham-road, accounts have now been issued, showing liabilities £5,005, of which £4,534 is unsecured, and assets £1,101. The failure is attributed to losses through the carpenters' strike, the failure of a large debtor to the estate, to losses on other bad debts, and to losses by accommodation bills. The Official Receiver reports that the assets of the joint estate have been disposed of, with the consent of the principal creditors, for £1,000, and that a dividend will be declared as soon as possible.

BREACHES OF BY-LAWS.—At Exeter police-court, last week, Albert Hayman, a builder, of Exmouth, was summoned under three charges by the St. Thomas sanitary authority: (1) For not having, after the completion of the erection of a building at Withycombe, sent to the surveyor of the sanitary authority notice of completion; (2) for having covered up a drain in the said building, not having given notice to the surveyor of his intention to do so; and (3) for having constructed a cesspool not in accordance with the requirements of the by-laws. Mr. Harbottle, surveyor to the authority, said he had received no notice of the completion of the building, which was occupied, though not in a fit state to be occupied. The drains were not properly constructed, and the cesspit was covered over, and had no ventilation except into the house. Defendant said he had received no notice from the surveyor that anything was wrong. The chairman replied that defendant had a copy of the by-laws, and it was rather too much to expect a public body to instruct him in them. Defendant would be fined £1 for each offence and costs. There would be a further penalty of 40s. for every day on which the nuisances existed after defendant had received a notice to abate them.

WALSALL BUILDERS AND THE BY-LAWS.—At the Walsall Police-court on Friday, James Rowley, builder, Hope-street, was summoned for failing to provide a ventilation shaft for drainage on property in his occupation. Mr. Middleton (borough surveyor) proved the case, and defendant was fined 40s. and costs.—Alfred Westbury, Green-lane, was summoned as owner for non-provision of proper footings to a building in Green-lane. Mr. Middleton

said that in this case defendant had had a one-story shop erected, the walls of which had one course of footings only, instead of two. Apparently the offence had been committed by the builder employed. Defendant said that this was so; it was entirely the fault of the contractor. He promised to give a guarantee that no additional stories should be put to the building, and the case was adjourned *sine die*.

IN RE C. P. MILLS.—From the observations of the Official Receiver under a receiving order against Charles Phillips Mills, it appears that the debtor had for the past 13 years carried on business as a builder and decorator, up to 1881 in partnership with another person, but since then alone, at St. Mary's Works, Stoke Newington. He attributes his failure partly to a loss of £200 on leasehold house property, but also to depreciation in the value of freehold property at Page-green, Tottenham, and to interest on loans. The liabilities are returned in the statement of affairs at £1,375, of which £379 are unsecured, with assets £201. An adjudication of bankruptcy has been made.

CHIPS.

The Roman Catholic Cathedral of St. Andrew's, Great Clyde-street, Glasgow, which has recently undergone a thorough renovation, was reopened on Sunday. The chief alterations consist in the removal of the old side galleries, and the erection of two elaborately-carved altars of Caen stone, from designs by Messrs. Pugin and Pugin, Westminster.

The famous Tretyakov Gallery of pictures, by Russian artists, including a specially fine collection of Vereschagin's, has been bequeathed by the late owner to the city of Moscow, together with funds for the maintenance and extension of the gallery.

The Prison Commissioners are having extensive alterations carried out on the structure and arrangements of Greenock prison. A new entrance is being made to the governor's house, the prison courtyard is being improved, new offices constructed, and an additional story put on the tenement occupied as warders' houses. The cost will be about £1,800.

At St. Peter's Church, Hereford, the east window has been filled with stained glass as a memorial to the late vicar. The subject is the Ascension of our Lord, and the artists are Messrs. W. Pearce and Co., of Birmingham. The unveiling took place yesterday (Thursday) afternoon.

Sir George Reid, P.R.S.A., has presented to Aberdeen University a portrait of the Rev. Dr. Milligan, Professor of Biblical Criticism in the University. The portrait will be hung in the Senatus Room at King's College, Aberdeen.

The new Central Station, Wigan, constructed by the Manchester, Sheffield, and Lincolnshire Railway, was opened on Monday by Lord Cross, who said that it was hoped before long to carry the line on to the North.

A carpenter named George Bowden, in the employ of Messrs. Higgs and Hill, was at work on the Surrey County Buildings at Kingston, on Saturday, when he was killed by an accidental fall through a skylight opening in the roof. No one witnessed the accident, although there were fifty men at work on the building.

One of the first premiums awarded in the competition for the design of a new museum for Darmstadt has fallen to a Danish architect, Herr Neikelmann, who is established at Stuttgart. The other premium was given to Herren Schneiden and Speer, of Berlin. It is estimated that £75,000 will be required to carry out Herr Neikelmann's design.

Henry Aldridge, a warehouse clerk, has been remanded by the Birmingham stipendiary magistrate on a charge of arson. The prisoner was in the employment of a local firm of decorators and paper-hangers, John E. Lee and Co. Three fires, believed to be of incendiary origin, had taken place on their premises within the last fortnight.

The London County Council received, on Tuesday, a report as to the progress that is being made with the Boundary-street scheme under the Artisans' Dwellings Acts. Of the 183 claims, 159 have been settled for £228,317, the amount claimed having been £385,656. Notices have been served for closing 135 houses, and 121 more are to be closed as soon as practicable, leaving 50 houses to be occupied and maintained in repair for the present.

South Morningside School, Edinburgh, which has just been completed by the St. Cuthbert and Dean School Board, was opened on Monday by Professor Masson. The school provides accommodation for 600 pupils, and the building can be added to without interfering with the work of the school when that is required. In addition to the ordinary classrooms, there are special rooms for cookery and sewing. The architect is Mr. R. Wilson, Queen-street, Edinburgh.

WATER SUPPLY AND SANITARY MATTERS.

INSANITARY DWELLINGS IN OLDHAM.—"An exceedingly bad state of affairs," to quote from the engineer's report on the case, was revealed last week by an investigation made into the state of property in a court off John-street, Oldham, by Messrs. Theodore S. MacCallum and E. Codling, civil engineers, of Manchester, by order of the borough coroner for Oldham. The property is of the back-to-back class. The fireplace on the upper floor was found to be bricked up air-tight, the drains were neither disconnected nor trapped, and were in addition so leaky that the sub-soil resembled a cesspool. It is to be feared that much property of this back-to-back class is in a similar insanitary condition.

LONDON WATER SUPPLY.—The Royal Commission on the water supply of London resumed its sittings on Wednesday, Lord Balfour of Bursleigh presiding. Mr. Thomas Hawkesley, past-president of the Institute of Civil Engineers, advocated a periodical inspection, in order to prevent waste, and recommended the formation of storage reservoirs in the lower parts of the Thames Valley. Rivers, he said, had great self-purifying powers. The water supply had never occasioned a cholera epidemic in the Metropolis. It was a remarkable fact the cholera always moved up rivers, and did not come down them. Mr. Peregrine Birch said a great deal more water might be taken from the Thames without injury to the river. Sir Frederick Bramwell, C.E., expressed the opinion that the consumption of water per head per diem in the Metropolis was made to appear much larger than it really was, owing to waste consequent to a great extent on leakage.

The restoration of the Grand Reception-room at Windsor Castle, which contains the famous "Golden Fleeces" tapestries, is nearly completed. The cream colour of the panelling has been retained, and the old gilding revived, and the apartment, which is one of the finest among the State Rooms, now presents a very handsome appearance. The work is carried out under the supervision of Mr. Collmann, her Majesty's Inspector of the Palace.

Among purchases recently made for the National Portrait Gallery are a study in full length of Lord Nelson, drawn in 1802 by Henry Edridge; a likeness of Thomas Girtin, by John Opie; Viscount Castlereagh, by Sir Thomas Lawrence; Thomas Killigrew, by Vandyck; John Leech, by Sir John Millais; an equestrian sketch in oils of Marlborough, by Sir Godfrey Kneller; and the Earl of Lincoln, by Ketel.

The city council of Bristol have under consideration a scheme recommended by a committee for creating a Greater Bristol. The districts proposed to be included embrace St. George, Kingswood, Stapleton, Horfield, Westbury, a portion of Henbury, Shirehampton, and the out-parish of Bedminster. The acreage of the borough would thus be increased from 4,971 to 23,000 acres, the total population according to the last census would be about 272,000, and the rateable value would be raised from a million to a million and a quarter.

The parish church of Minshall, which has recently been undergoing renovation, was reopened on Tuesday week by the Bishop of Chester. The church was built in 1772, and had become dilapidated. To Mr. Matthews, builder, of Nantwich, was intrusted the work of renovating the exterior, which mainly consisted of the putting on of a new roof, the building of new stone pinnacles to the tower, and the pointing of the walls. The interior of the church has been decorated by Mr. Davies, of Nantwich; and the chancel has been inlaid with mosaic work. The cost has been over £500.

Birmingham is emulating the example of Manchester by decorating its town hall with paintings illustrative of the history of Birmingham. The corporation are, says a local journal, setting about the undertaking in an original way. No competition is announced, and no Royal Academician has been approached; but the cartoons are being produced in the School of Art by students under the superintendence of the head master, Mr. Taylor. The first design, by M. Gehr, is already completed, and ready to be transferred to its appointed place.

The Lord Mayor opened the Camberwell Public Baths and Washhouses in Church-street on Saturday afternoon. In the building, which has cost £28,575, are 64 private baths for men and 32 for women, together with first and second-class swimming-baths for men, both of equal dimensions—viz., 120ft. by 35ft. Each of these latter contains 130,000 gallons of water, and can be completely emptied in an hour. There is also a public laundry, which contains 69 washing compartments. Messrs. Spalding and Cross, whose design was selected in competition three years since, were the architects. The zinc roofing has been executed by Messrs. Holden and Co., of 5, Wood-street, S.W., on their patent unsoldered system.

Our Office Table.

THE design and appearance of the present silver medal given by the Architectural Association being considered by some members of the committee unsatisfactory, Mr. Leonard Stokes, past president, mentioned the matter to Mr. Alfred Gilbert, A.R.A., who generously offered to design a new medal, not as an ordinary commission, but as a personal gift to the association. A model in wax of Mr. Gilbert's design will be on view either at to-night's conversation at the Imperial Institute, or at the annual meeting at 9, Conduit-street a fortnight later.

WE have to announce that two courses of lectures will be given on Applied Art by Mr. Hugh Stannus, F.R.I.B.A., in the University of London. Each course will consist of ten lectures, on Tuesdays and Thursdays from 7 to 8.30 p.m. The first course will illustrate the application of ornament in architectural decoration, and will extend from Tuesday, 11th of October, to Thursday, 10th of November next, both inclusive. The second course will treat of vase-form and vase-decoration, and will extend from Tuesday, 15th November, to Thursday, 15th of December. The lectures will be illustrated by diagrams, drawings, and photographs, and the fee for both courses is £1 1s. To all students of architecture and ornamental art, these lectures by so competent an authority cannot fail to be instructive.

THE twelfth annual meeting of the members of the Birmingham Guild of Handicrafts was held on Monday night at the workshop, Lower Priory, under the presidency of Councillor A. Dixon. The annual report showed that, owing to the demolition of the workshop in Lawrence-street, and the necessity of carrying on their work in temporary premises during the building of the new workshop in Sheep-street, the guild had been working under some disadvantage during the past year. In spite of that, however, the membership of various classes had been well maintained, and good progress had been made in their work. The Treasurer reported that there had been a large increase in the sale of work. Arrangements had been made with the University of Oxford for the formation in connection with the guild of a course of university extension lectures for working men. The recreative classes for the winter season reopened on Tuesday evening. They include drawing, chip-carving, carpentering, wood-carving, leather-work, and metal work.

AN account of the practices of the building trade guilds, which still exist in the remoter provinces of Austria, and keep up customs which have descended from the Middle Ages, is given by Herr Franz Paul Piger, of Iglau, in the *Bautechnische Zeitschrift* of Berlin. In the case of Austria, these traditional practices have a peculiar political interest, inasmuch as it is by means of the trade guilds that German national feeling, and the German language itself, has been kept alive in districts where the German inhabitants would have been absorbed in the flood of Slavonic immigration had it not been for these trade corporations. Although the trade guilds have now no official standing, and a great deal of building is executed without their aid, they maintain their organisation and many of their old customs; and their members, proud of their position, look down with contempt upon the "day-work men," whom they regard as ignorant interlopers. The principal building corporations are those of the masons and carpenters, who have never yet been able to settle the question, which has harassed them since the Middle Ages, of the comparative dignity of the two corporations. At present, the rules of the masons' and carpenters' guilds are nearly the same, and in each, admission to membership is only to be had after three years of apprenticeship.

MR. PERCEVAL, the Agent-General for New Zealand in London, forwards a report of the Bureau of Industries explanatory of the new system of constructing roads and railways by what are called co-operative contracts. In these a small party of men, generally six in number, is allotted a certain section or length of road or line; one of them is elected a "ganger" and trustee for the others, to deal for them with the Government. The Government engineer states a price for the portion of work, and, as this is done by an unprejudiced officer, it is generally accepted without murmur by the men. The

results usually have been very satisfactory. Progress payments are made fortnightly, for the benefit of the men's families, and the whole amount is paid up in cash on the work being passed by the engineer. It is the intention of the Government to provide small farms of 10 or 15 acres each for these workmen, in village settlements, so that they may be induced to make their homes in country districts, and thus in some degree to neutralise the centralising tendency of modern industrial life.

The Architectural Association, 9, Conduit Street, W.; and 56, Great Marlborough Street, W.

THE ARCHITECTURAL ASSOCIATION COURSES OF LECTURES, CLASSES, and STUDIO INSTRUCTION WILL COMMENCE ON MONDAY, October 10.

The Courses are both Elementary and Advanced, and are designed to provide a sound professional education, supplementary to that to be obtained by the prevailing system of pupils. The Course, which is in four divisions, is progressive and consecutive, and the instruction is given by Lecturers and Instructors of known ability.

DIVISION I.

LECTURES AND CLASSES.—The Orders of Greek and Roman Architecture, Building Materials, Perspective, Physics.

THE STUDIO.—Drawing from Ancient Examples, Freehand Drawing, Drawings of Examples of Elementary Construction, Plane Geometry, Criticism Meetings.

DIVISION II.

LECTURES AND CLASSES.—English Architecture, Materials, Elementary Ornament and Colour Decoration, Strength of Materials, Stresses and Strains.

THE STUDIO.—Designs based upon Ancient Examples, Freehand Drawing, Drawings of Examples of Elementary Construction, Solid Geometry, Criticism Meetings.

DIVISION III.

LECTURES AND CLASSES.—The History of Architecture, Materials, Colour Decoration, Sanitary Science as applied to Drainage and Water Supply.

THE STUDIO.—The Design and Construction of Modern Buildings, Freehand Drawing from Casts, Perspective and Sciography, Constructive Masonry, Criticism Meetings.

DIVISION IV.

LECTURES AND CLASSES.—The History of Architecture; Sanitary Science—including Ventilation, Lighting and Heating, Painting, Sculpture; other Arts allied to Architecture; Professional Practice—including Legislative Enactments relating to Building Contracts.

THE STUDIO.—The Design and Construction of Modern Buildings, Freehand Drawing from Casts, Drawings of Ancient Buildings from actual measurement, Graphic Statics and Perspective, Criticism Meetings.

EXTRA SUBJECTS.

LECTURES AND CLASSES.—Plane and Solid Geometry, Geology, Mensuration, Land Surveying and Levelling, Chemistry of Building Materials, Quantity Surveying—including the Preparation of Estimates, Discussion Section.

THE STUDIO.—Sketching and Measuring, Elementary Water Colour Class, Water Colour Class, Modelling.

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Professor T. ROGER SMITH'S LECTURES ON ARCHITECTURE, CONSTRUCTION, and MODERN PRACTICE will be resumed in the week beginning October 9th.

The Evening Classes for the Study of BUILDING CONSTRUCTION and for STRUCTURAL DRAWING and ARCHITECTURAL DRAWING, established at University College by the Carpenters' Company, will be resumed at the same time. These classes meet from 7 to 9 p.m., and the fees are extremely moderate.

For further particulars consult the syllabus, to be obtained at University College, Gower-street, W.C.; and at Carpenters' Hall, London Wall, E.C.

J. M. HORSBURGH, M.A., Secretary.

The recently completed technical schools and free library for Ashton-under-Lyne were opened to students on Monday. The total cost of the buildings has been £16,000. Messrs. John Eaton and Sons, of Ashton, are the architects.

At a meeting of the town council of Edinburgh held on Tuesday a proposal that the burghs of Edinburgh, Leith, and Portobello should be merged into one municipality was approved generally, and it was remitted to the Lord Provost's committee to take the whole matter into further consideration and to report.

The election to the Disney Professorship of Archaeology will take place on December 1, at Christ's College, Cambridge. The professor is required to deliver six lectures at least in the course of each academical year. The professorship is tenable for five years, and the professor may be re-elected; but the present professor, Canon G. F. Browne, does not seek re-election.

A new Cottage Hospital has been erected at Warminster, and special attention has been paid to the ventilation, which has been carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

M. Vital Gabriel Dubray, the Parisian sculptor, died on Tuesday, at the age of 74. He studied under the younger Ramey, was engaged on the Jeanne d'Arc memorial at Orleans, and executed statues of Napoleon, Sully, Lannes, and other celebrities.

The portrait of Sir Henry Macandrew, ex-Provost of Inverness, painted by Sir George Reid, P.R.S.A., was presented to the corporation of Inverness by the subscribers on Friday. It will be hung in the town hall of that city.

STATUES, MEMORIALS, &c.

EDINBURGH.—Designs for a memorial to the late Lord Justice-General Inglis, to be erected within the walls of St. Giles's Cathedral, have just been sanctioned. The memorial, designed by Dr. Rowand Anderson, architect, takes the form of a marble tablet with 17th-century features. Like the Montrose memorial, recently erected from the same architect's designs, the memorial to the Lord Justice-General will be executed in varied coloured marbles and alabasters. It will be placed on the east wall of the Preston aisle. The principal feature of the memorial is a central panel, the background of which will be a slab of Emperor's red marble. On this is superimposed a piece of drapery in white alabaster, looped up at the middle and at the sides, and on which is carved the following inscription:—"In memory of the Right Hon. John Inglis, of Glen-corse, Lord Justice-General of Scotland, Lord President of the Court of Session. Born August 21st, 1810; died August 20th, 1891." On each side of the panels are shields on ornamental backgrounds, one bearing the arms of the University of Edinburgh, and the other those of the University of Glasgow. In the centre of the pedestal panel are two figures supporting a shield bearing the heraldic insignia of the College of Justice, and in small panels, immediately under the base of the columns, are shields with the arms of the Universities of St. Andrew's and Aberdeen. The crowning feature of the tablet is a shield within a circle, carrying the personal arms of the deceased, and surmounted by the family crest—a lion rampant. The height of the monument will be 9ft., and its width 7ft.

CHIPS.

The chairman of the Oldham School Board opened last week the new extensions of the Westwood board schools. The works have been carried out by the executors of the late E. Whittaker, of Rochdale-road, Oldham, from plans by Messrs. Winder and Taylor, Union-street, Oldham.

The Bishop of London unveiled the memorial window to Mr. W. H. Smith in the church of St. Martin's-in-the-Fields yesterday (Thursday) afternoon at four o'clock.

A new hotel is about to be built at Llangamarch Wells, Radnorshire, at a cost of £20,000. It will contain about 700 beds, and the usual general accommodation. Mr. T. P. Martin, of Swansea, is the architect.

New carved oak choir-stalls, executed by Mr. J. Sharp, of Westbourne, and a wrought-iron screen and gate to chancel, were erected on St. Michael's Day in St. Michael's Church, Bournemouth, from designs by Mr. Reginald G. Pinder, F.R.I.B.A.

The Oldham town council have passed a resolution empowering the town clerk to apply to the Local Government Board for sanction to borrow £200,000, to cover the cost of constructing sewage works.

Extensive works of sewerage are being carried out for the Royton local board. The scheme of sewerage was originally designed by the late Mr. R. Vawser, C.E., and is being carried out under the direction of Mr. Theodore S. McCallum, of Manchester.

The new infirmary buildings at Aberdeen were opened by Princess Louise on Tuesday. The present is the sixth reconstruction of the buildings on the existing site since the foundation in 1739. The architect for the present work was Mr. Kelly.

M. Emile Signol, the painter, died on Wednesday, aged 88. He studied under Gros, and a number of his pictures are at Versailles and in Paris churches. He entered the Academy of Fine Arts in 1860.

A public inquiry relative to an application of the town council of Rochdale for sanction to borrow £77,000 will be opened to-day (Friday) by Mr. Arnold Taylor, engineering inspector of the Local Government Board. The £77,000 is made up of two items—£65,000 for gasworks purposes, and £12,000 for purposes of street widening and improvement.

In the case of the application for discharge from bankruptcy, made on behalf of John Edwards and David Edwards, trading as Edwards Brothers, of Treherbert, builders, the order of discharge has been suspended for six months, ending December 16, 1892. In the case of George Egbert Thomas, surviving partner of the late firm of Charles Thomas and Sons, of West Cowes, I.W., the discharge has been suspended for twelve months, ending May 4, 1893.

Mr. Edward Tidman, C.E., F.S.I., M.S.A., of Westminster, has just been appointed lecturer on Hygiene, and commences a course of lectures on Oct. 13 at Cheshunt, Herts, for the Cheshunt Technical Education Committee. Mr. Tidman is also lecturer for Essex on the same subject.

Trade News.

WAGES MOVEMENTS.

LONDON DISTRICT CODE OF WORKING RULES.—The United Trade Committee of Carpenters and Joiners have forwarded a circular to all builders in the Metropolitan district, drawing attention to the code of working rules for carpenters and joiners in the London district, agreed to and signed by representatives of the Central Association of Master Builders, and a representative of that trade (together with representatives of other trades), at conference convened for that purpose on June 10th and 23rd, 1892. They remind employers that the new code, the leading points in which are now well-known to our readers, will come into operation throughout the twelve miles radius from Charing Cross on and after the 7th day of November next.

LONDON BUILDING TRADES FEDERATION.—In spite of a downpour of rain, some four or five thousand of those engaged in various departments of the building trades took part on Sunday in a march to, and demonstration in, Hyde Park, the object of which was to celebrate the federation of the trades, and to discuss the steps to be adopted in view of the new arrangements which, as a result of lengthy conferences between those interested, come into force on the 7th of November. Four waggons had been set apart as "platforms," the respective chairmen being Messrs. D. Hennessey, Jeffrey, W. Baines, and L. Hall. A resolution was adopted pledging the federation to stand by the new rules, and to give both moral and financial support to any of the federated trades which might not participate in the advanced wages and shorter hours which are features of the new arrangements.

NELSON, LANCS.—The strike of plumbers at Nelson, Lancashire, has been settled on the men's terms, and work was resumed on Monday, the employers having agreed to transfer the plumbing apprentices objected to to the operative painters' department of their workshops.

Holloway's Ointment.—This cooling Ointment perseveringly rubbed upon the skin, is the most reliable remedy for overcoming all diseases of the throat and chest. Quinsy, relaxed tonsils, sore throat, swollen glands, ordinary catarrh, and bronchitis may be arrested as soon as discovered, and every symptom banished by Holloway's simple and effective treatment.

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TENDERS.

Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

BATH.—For constructing a wall and railings at the west end of Lower Common in Park-lane, for the city council:—
Long and Sons (accepted) £219 5 0

BIGGLESWADE.—For alterations and additions and a new furnace chimney shaft at the Union Workhouse, Biggleswade. Mr. E. Twelvetrees, Sandy, architect:—
Willmott, Hitchin £119 0 0
Bedhouse, Stotfold 114 0 0
Coleman, Bedford 998 0 0
Ruffell, Biggleswade 975 0 0
French and Ellwood, Sandy* 967 0 0
* Accepted.

BRIXTON, S.W.—For erection of new theatre, for the Brixton Theatre Company, Limited. Messrs. Crewe and Sprague, Fitzalan House, Arundel-street, Strand, W.C., architects. Quantities by Messrs. Brunson and Henderson, 47, Pall Mall, S.W.:—

Veale, G., and Co.	£14,850	0	0
Jarvis and Sons	14,777	0	0
Newmans, Limited	13,900	0	0
Bush, A., and Sons	13,870	0	0
Barnard, Wells, and Co.	13,700	0	0
Allen and Sons	13,465	0	0
Collis and Sons	13,415	0	0
Young and Londale	12,977	0	0
Kirk and Randall	12,720	0	0

(Architects' estimate, £12,500.)

BRACKLEY.—For new choir stalls at St. Peter's Church, Wickham-road, Brackley, S.E. Mr. John Jas. Downes, 11, The Parade, Lewisham, High-road, S.E., architect:—
Dorey, J., and Co. £903 0 0
Hawes, G. 293 10 0
Lorden, W. H., and Son (accepted) 269 0 0

CHADWELL HEATH.—For the erection of a row of four cottages at Chadwell Heath, near Ilford, for the Great Eastern Railway Company:—
Rogers and Robson, Brentwood (accepted).

DEPTFORD.—For new closets and sanitary matters under the Public Health Act, at Normandy Wharf, Ravensbourne-street, Deptford, for Mr. Walter C. Mockford, Mr. John Jas. Downes, 11, The Parade, Lewisham, High-road, S.E., architect and surveyor:—
Wilson, A. £82 10 0

DEPTFORD.—For the erection of new closets, &c., under the Public Health Act, at 292, Lower-road, Deptford, for Messrs. Slazenger and Son. Mr. John Jas. Downes, 11, The Parade, Lewisham, High-road, S.E., architect and surveyor:—
Wilson, A. £99 15 0
Best, S. R. 94 5 6

DEVON.—For constructing new bay windows throughout the County Asylum, for the Devonshire County Council:—
Phillips, H. (accepted).

EAST FINCHLEY.—For repairs and painting to lodges and greenhouses at the Cemetery for the Islington Burial Board. Mr. F. H. Barfield, F.S.I., M.S.A., 55, Lancaster-road, Stroud Green, N., architect and surveyor:—
Torrington, N. C., jun. £250 0 0
Stevens Brothers 205 0 0
Marchant & Hirst, Highgate-road* 139 10 0
* Accepted.

EAST FINCHLEY.—For erection of a cottage lodge, &c., at Irish Corner, for the Islington Burial Board. Mr. F. H. Barfield, F.S.I., M.S.A., 55, Lancaster-road, Stroud Green, N., architect and surveyor:—

Marchant and Hirst	£359	0	0
Stevens Brothers	357	0	0
Plowman, C.	355	0	0
McFarlane Brothers	352	0	0
Wheeler and Co.	339	10	0
Cooper, H.	337	0	0

GREAT YARMOUTH.—For additions to Cobholm Island School, for the Great Yarmouth school board. Messrs. Bottle and Olley, architects. Quantities by the architects:—

Bray, F. W.	£128	0	0
Barnard, M.	415	17	6
Eastoe, R.	378	18	0
Beech, G. W.	374	0	0
Grimble, T.	374	0	0
Moore, J.	369	0	0
Cooper, I. S.	362	17	0
Leggett, J. (accepted)	352	0	0

GREAT YARMOUTH.—For additions to Runham Vauxhall School, for the Great Yarmouth school board. Messrs. Bottle and Olley, architects. Quantities by the architects:—

Eastoe, R.	£445	8	0
Bray, W.	444	0	0
Grimble, T.	418	0	0
Cooper, I. S.	412	0	0
Beech, G. W.	410	0	0
Moore, J.	405	0	0
Leggett, J.	399	0	0

HIGH WYCOMBE.—For alterations to business premises, for Mr. H. Harvey. Mr. Thos. Thurlow, High Wycombe, architect:—

Flint, H.	£315	0	0
Hunt, C. H.	294	0	0
Gibson, G. H.	288	0	0
Looseley, W. R.	275	14	0
Harris, J. T. (accepted)	264	0	0

HIGH WYCOMBE.—For the erection of bakehouse, business premises, residence, and villa attached, for Mr. Benjamin Channer. Mr. Thos. Thurlow, High Wycombe, architect:—

Looseley, W. R. (accepted)	£1,949	0	0
Baker's oven:—			
Kirkby, J. (accepted)	110	0	0

HIGH WYCOMBE.—For erection of new chair manufacturing premises at High Wycombe, for Messrs. J. Cox and Son. Mr. Thos. Thurlow, High Wycombe, architect:—

Hunt, C. H.	£2,640	0	0
Flint, H.	2,277	0	0
Looseley W. R., Son, and Pearce	2,023	0	0
Harris, H.	1,936	0	0
Nash and Sons	1,925	10	0
Gibson, G. H. (accepted)	1,904	0	0

HIGH WYCOMBE.—For the re-erection of the Corporation Arms, for Messrs. Wheeler and Co., Wycombe Brewery. Mr. Thos. Thurlow, High Wycombe, architect:—

Hunt, C. H. (accepted)	£1,293	15	0
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ISLINGTON.—For alterations to restaurant, confectioners' shop, bakehouse, &c., for Messrs. Galloway and Son, 230, Upper-street, Islington. Mr. Ernest H. Abbott, 6, Warwick-court, High Holborn, W.C., architect. Quantities by Mr. A. Johnson, 5, Imperial Buildings, Ludgate-circus, E.C.:—

Godden	£2,952	0	0
Shurmer	2,736	0	0
Wontner, Smith, and Son	2,634	0	0
Bywaters	2,580	0	0
Drew and Cadman	2,455	0	0
Hall, Beddall, and Co.	2,430	0	0
Anley, J.	2,372	0	0

LICHFIELD.—For building a new dining-hall, kitchen, laundry, and other works to the workhouse, Lichfield. Mr. W. H. Woodroffe, A.R.I.B.A., architect:—

Harley, J., and Son, Smethwick	£3,525	0	0
Hodges, G., Burton-on-Trent	3,590	0	0
Whitmore, A. F., Stafford	3,498	0	0
Parnell, J., and Son, Rugby	3,478	0	0
Varlow, J., Burton-on-Trent	3,472	0	0
Lowe, T., & Son, Burton-on-Trent*	3,287	0	0
Walkerline, W., Derby+	2,860	0	0

* Accepted. + Withdrawn.

LONDON.—For alterations and additions to 1A, Sidney-street, Goswell-road, for Mr. Evans. Mr. E. J. Harrison, 70 and 72, Chancery-lane, architect:—

Lilley and Lilley	£593	0	0
Burton	361	0	0
Houghton, E., and Son	337	0	0
Ward and Lambie	327	0	0
Holbrook	325	0	0

LONDON.—For alterations and repairs to offices, 60, New Broad-street, City. Mr. H. Riches, 3, Crooked-lane, King William-street, E.C., architect:—

Boyd, C. H.	£188	10	0
Osborn and Sons (accepted)	129	0	0

LONDON.—For rebuilding offices and ware rooms, No. 24, Lawrence-lane, City, for Mr. H. P. Edwards. Mr. Herbert Knight, 129, Cheapside, architect. Quantities by Messrs. Ruat and Young:—
Bailey, H. (accepted) £3,279 0 0

LONDON.—For alterations and additions to 33 and 35, Queen's-road, Peckham, for Mr. Josiah Messent. Mr. J. C. Reynolds, 30, Camberwell-green, S.E., architect:—

Ansell	£797	0	0
Young and Lonsdale	760	0	0
Cox, J. and H.	785	0	0
Balaam Bros.	729	0	0
Smith	686	0	0
Parker	665	0	0
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Cha^s Cobham Arch^t



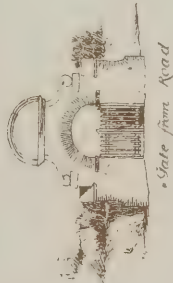
East Elevation



South Elevation



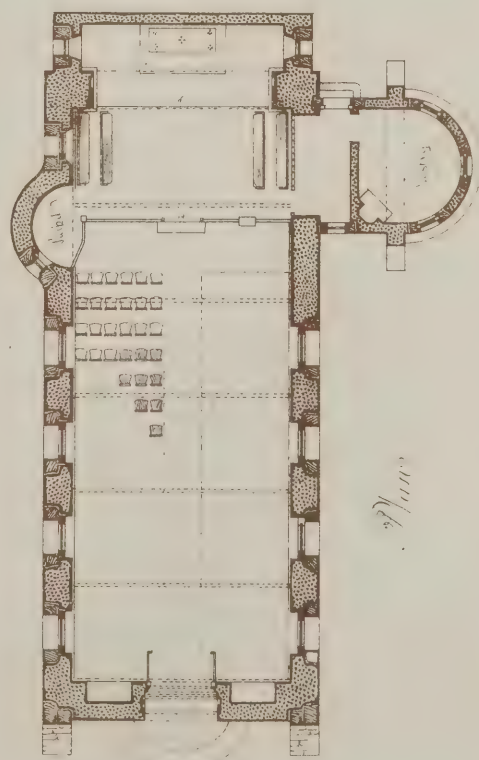
West Elevation



Gate from Road

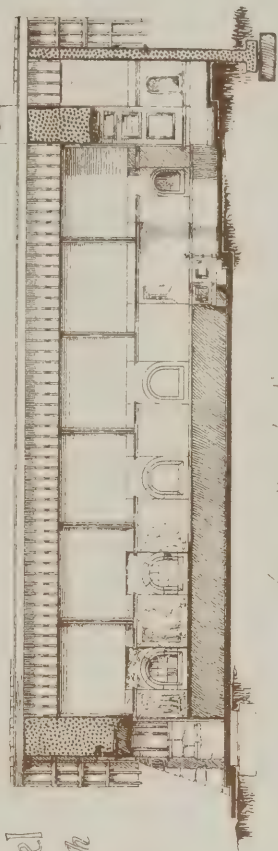


Ashes



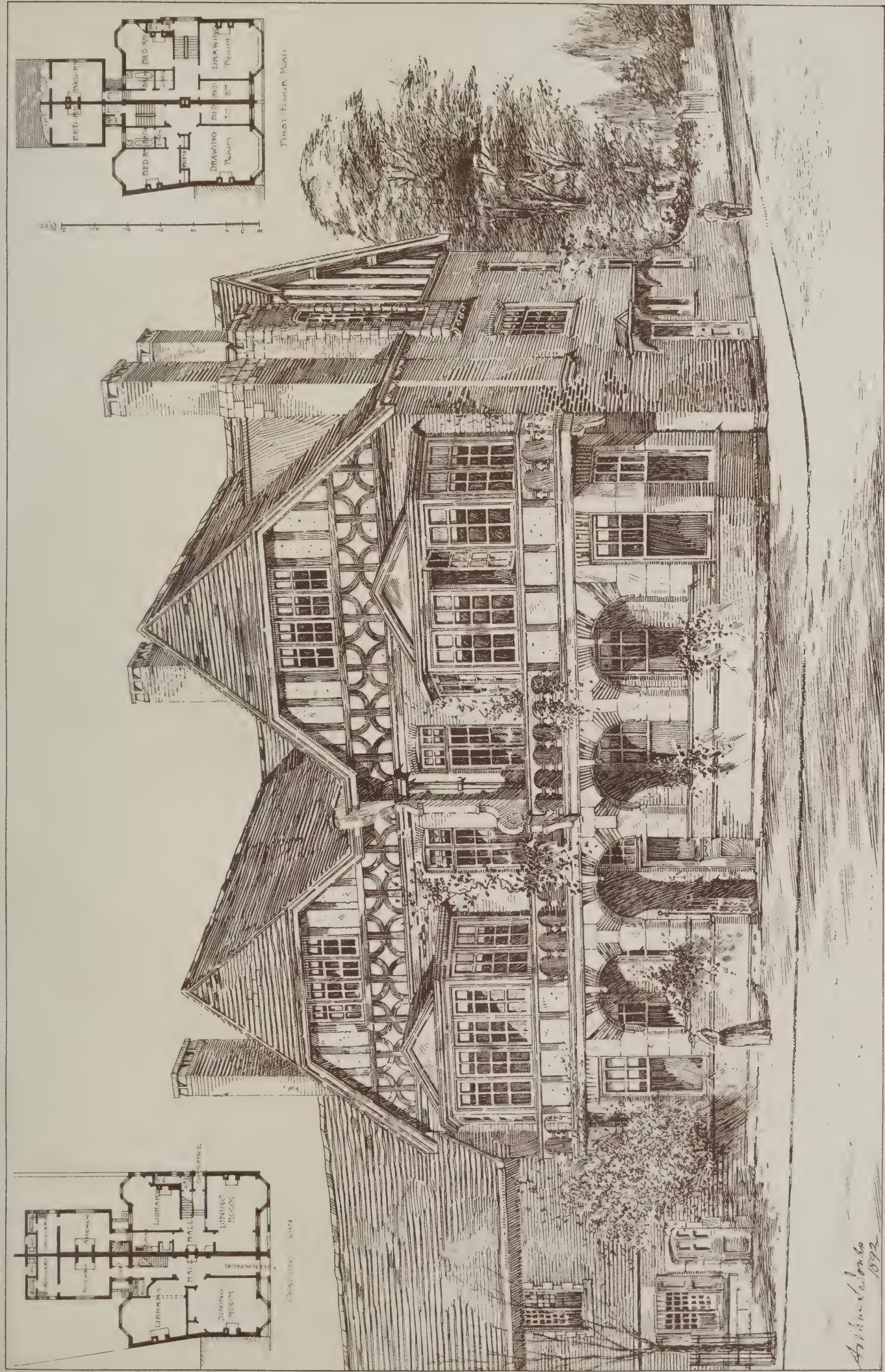
Plan

Proposed Mission Chapel
on Black Heath, Womersley
Near Guildford



Longitudinal Section

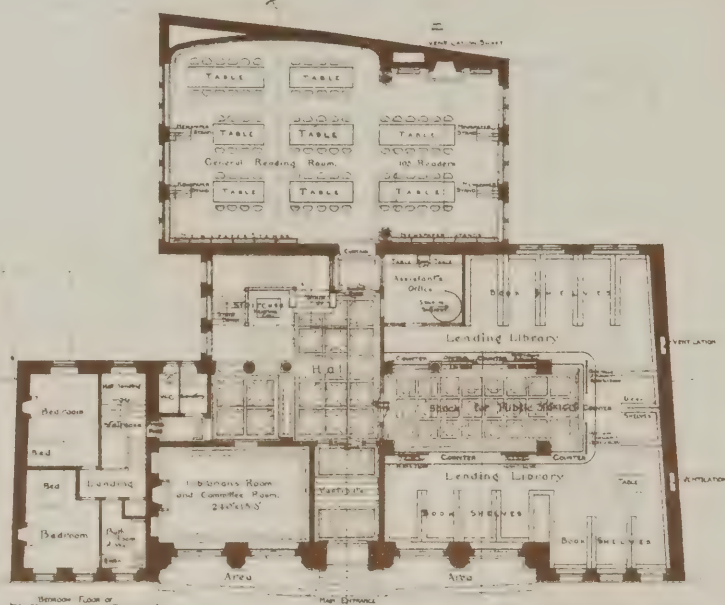
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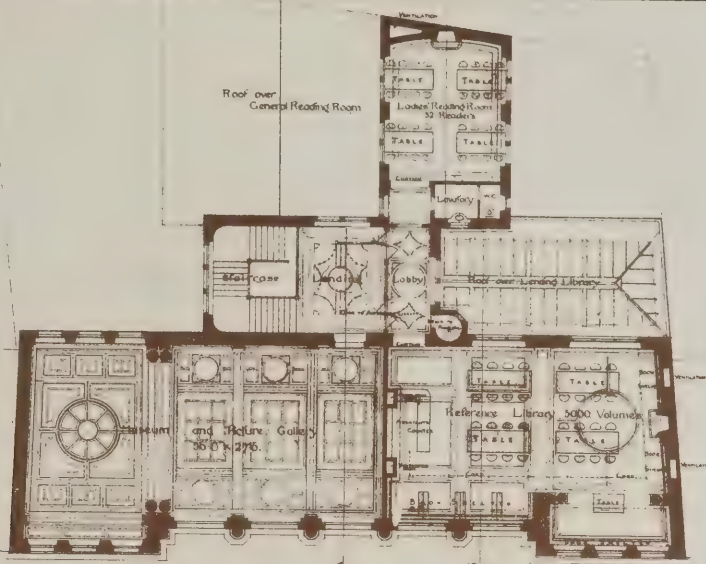
PLAN OF GROUND FLOOR

Scale of 0 to 80



Oct. 7, 1892.

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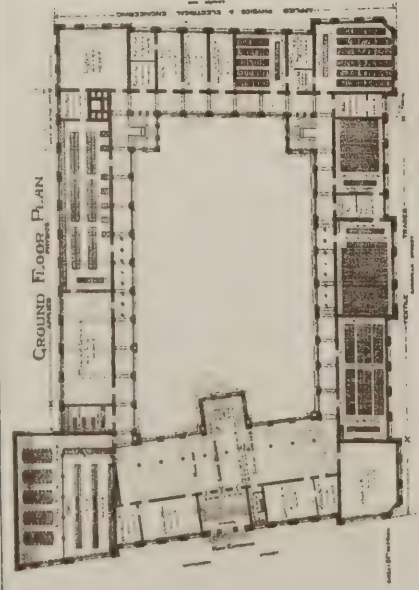


PLAN OF UPPER FLOOR



Campbell Douglas & Morrison
Architects, Glasgow.

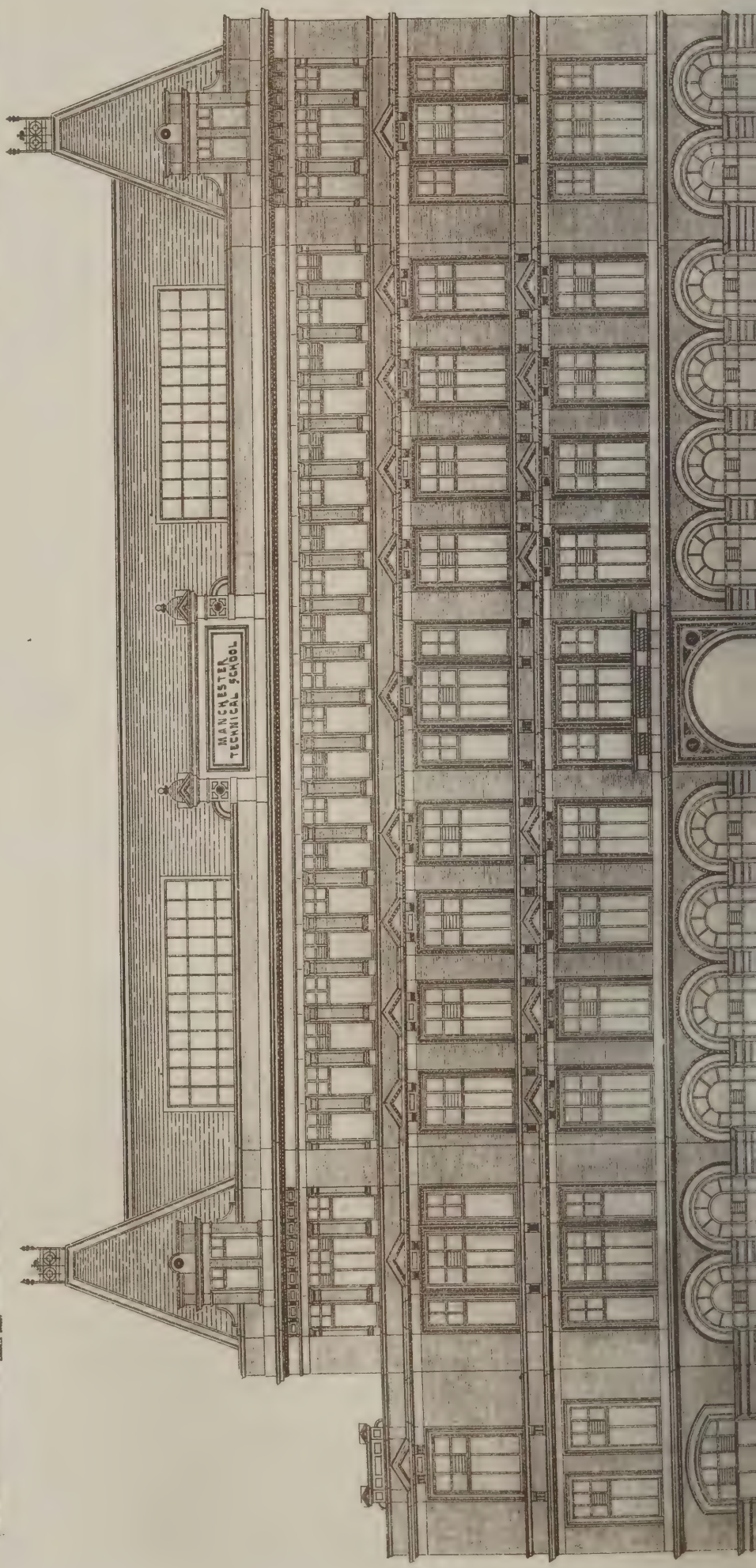
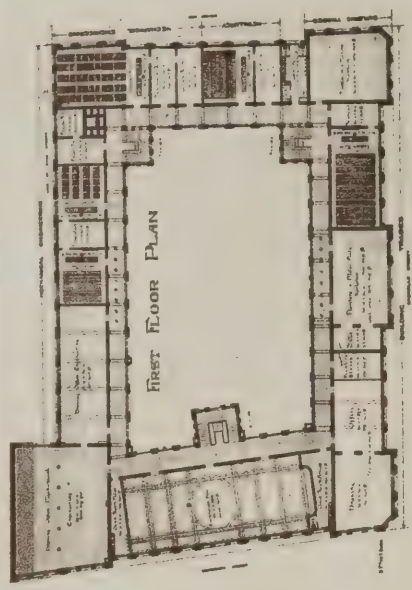
GROUND FLOOR PLAN



FOURTH PREMATED DESIGN

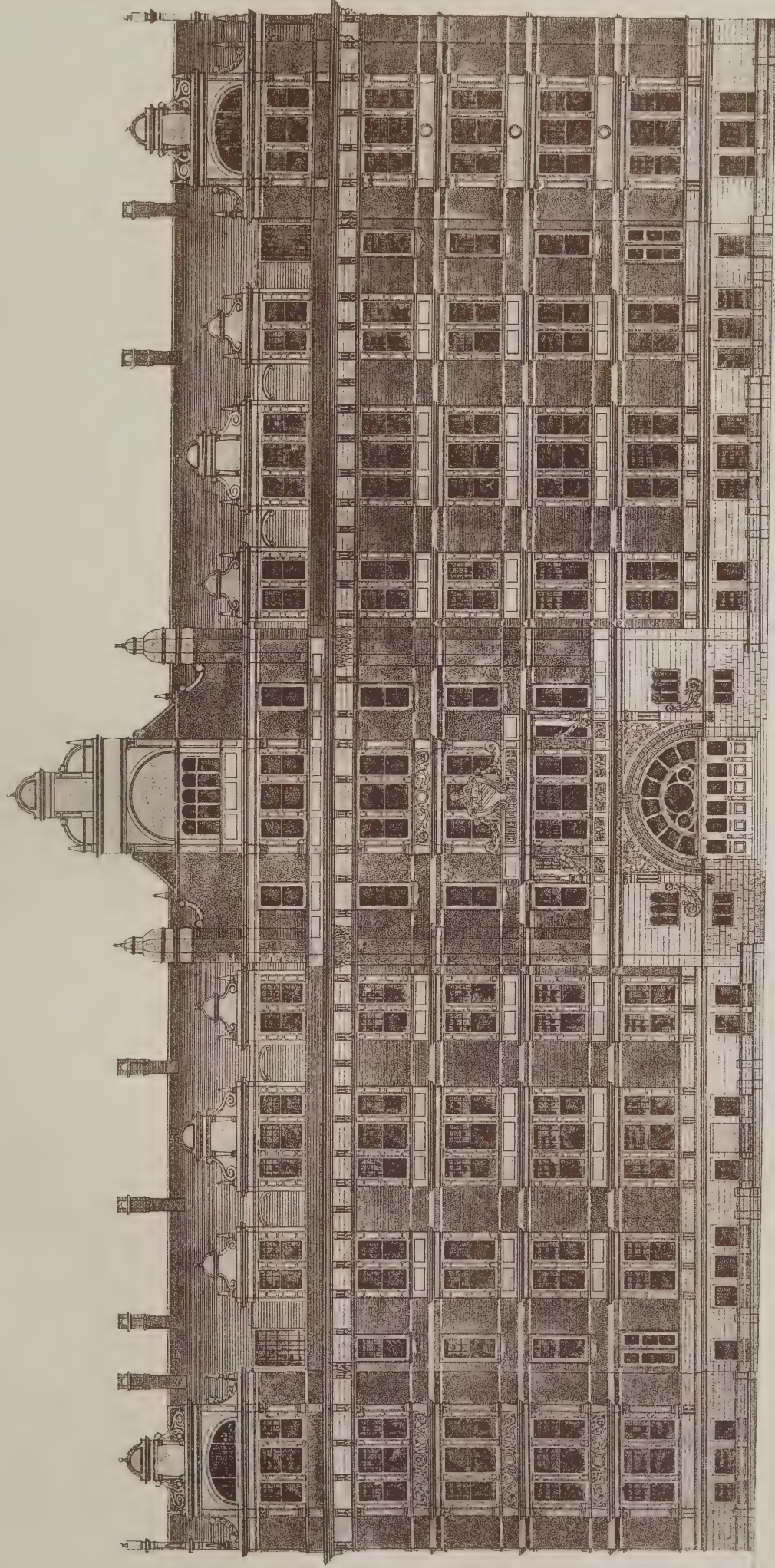
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FIRST FLOOR PLAN



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THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1971.

FRIDAY, OCTOBER 14, 1892.

THE DECORATION OF BUILDINGS.

VERY hazy ideas of the principles of ornament as applied to the decoration of buildings prevail amongst the profession. The fact is, that almost anything is thought to be decorative which has a certain degree of repetition of form, or contrast of colours. A stencilled frieze or a powdered wall, any repeat of a senseless pattern; a little colour and gilding, equally devoid of harmony, is called "decoration." And why? Form and colour appeal to most minds in very much the same way as religious sentiment or music does. Everyone thinks that he understands all about it, and that his own notions of what ought to be are right, notwithstanding all that artists and scholars of every age have done and said to the contrary; and we have now as much bigotry as to what is good and bad ornament as there is in matters of theological belief as to which is the right and wrong. These people are like those text-idolaters who will see nothing beyond their own narrow view of what suits them the best, and who refuse to learn anything of the great past, or the history of the means by which the documents or laws have been formed and handed down. They take to a certain theory of ornament or colour because they know no other, or have made few inquiries as to the different schools that have existed; but all this confusion has arisen from the great "split-up" of the arts, and the notion since current that art and ornament are things apart altogether from utility, and that ornament of any kind can be applied to an object or a building, as an ordinary person without any taste might paper a room and call it decorated.

Perhaps we cannot wonder so much at the general ignorance on questions of art when we consider the number of different ideas put forward by theorists; the want of a knowledge of the principles, and the vague and indefinite teaching that has been followed. When we see one scheme of decoration, say, for a vestibule or a room, totally different to another, both in the kind of pattern and the colour, employed in the same building, we are constrained to ask Which is the right principle? Each decorator can explain in his own manner the principle which has guided him. They cannot both be right, and they may be both wrong. For example, in wall decoration we may have a paper in which the diagonal distribution of pattern as a diaper is adopted in one room, and another of the same height and proportion on which the vertical arrangement of ornament is marked. They cannot both be based on right principles. Or, again, we see one design in which the parts are balanced, another in which they are scattered over the surface. The dogmatic assertions of professional decorators cannot be refuted by the public who pay. Like rival medical theories, they admit of no solution, except that in the latter instance there is the orthodox theory to fall back upon, whereas in ornament the followers of one school are almost as powerful as those of another. One repudiates the other, and the young student is puzzled by the contradictory opinions he finds in books no less than by the absence of all law and principles he finds in actual examples. As an instance, how can he accept, without considerable limitations, the utterances of the two opposite schools, the naturalistic and the conventional? By one we are explicitly told that exactly in proportion as the reference to nature becomes more direct, the art becomes

noble; by the other, that foliage and flowers, as subjects of decoration for our surfaces, are wrong in principle, and degrading. All this is very puzzling, and we cannot wonder that so many efforts by our chief decorative artists should be so completely contradictory and confusing. Modern decoration has failed to harmonise with our great architectural edifices, owing to the want of a general agreement. So long as we tolerate mere literalism which copies nature and applies it as decoration, we cannot expect to find any great ornamentalist such as those which graced the period of the Italian Renaissance, for such a system neither implies invention nor imagination. All ornament must be more or less conventional, and there has been no art without convention. Even the realist when he succeeds uses the very means he affects to despise; he has to adapt a leaf or a flower to a given position, and to treat it after the manner of the material, whether it be of wood, or stone, or metal, or textile fabric. The new directory of the Department of Science and Art gives some advice—good as far as it goes. It deduces laws of ornament from the observation of nature, and of good ornament it shows that the parts of plants are set out on a geometrical basis seen in the section of stalks, buds, fruits, &c.; and in the plans of flowers, that the arrangement of leaves and flowers are also on a geometrical basis. Keeping this law in mind, the ornamental artist can develop it, always bearing in mind the fitness of ornament for its place. We are glad to admit that we do not see such monstrosities now as baskets of fruit on carpets, or modelled representations shaded up on wall-papers; but we find still a want of conventionalising power, which implies a study of plants and flowers and other organic objects. Many designs we see for decoration show a total absence of anything like adaptation, or the selection of the right plants for particular purposes. The material ought to suggest the kind of plant. For textile fabrics, such as cottons and muslins, the delicate growths like poppies, grasses and ferns, and light flowers are certainly more appropriate; for wood and stone, the oak and similar massive plant forms. Adaptation should not overlook the character and growth of the plant. Some leaves and flowers are more suitable for horizontal, some for vertical positions, as they show in their growth these tendencies; other plants and flowers are better for large surfaces of walls, or ceilings. These are principles necessary for all decoration, whether realistic or conventional, and in this wider sense, indeed, all ornament must be natural. Only our great decorative artists have the ability to select the most appropriate and beautiful folial and floral forms, to abstract from them all that is characteristic, and adapt them to the material and position; and for modern examples we may point to the works of Morris, Burne Jones, Crane, and their followers. Panels and inclosed spaces, bands, and friezes are too often left to the taste of the painter or so-called decorator, who is content to fill up the space with meaningless scroll-work, honeysuckle, frets, and other conventional ornament. Whether a panel in a wall or a ceiling, the space is one requiring a skilful arrangement of lines, either of straight lines or curves. The student will find this subject analysed and treated in Mr. Lewis F. Day's "Planning of Ornament," and in Mr. J. Ward's "Principles of Ornament," edited by Prof. Aitchison, A.R.A., from which he may derive some assistance. Persian borders and Italian cinque-cento pilasters and panels, are the best examples to follow, though for plain surface ornament the Saracenic or Moorsque diapers are very appropriate. How many abortive attempts one sees in the mural decoration of churches, devoid of all character and scale. Chancel walls are sometimes decorated by diapers, checkers, and powdering,

but are so mechanically done that they only produce monotony and disappointment when viewed close. The scale is often too large. We are glad to find the subject of the application of ornament in architectural decoration is to be taken up in a course of lectures by Mr. Hugh Stannus, F.R.I.B.A., at the University of London.

Then, also in colouring we find a total disregard of any laws as to primaries, secondary and tertiary colours. How seldom we find the painter-decorator has studied anything but his own taste in selecting the colour or paper of his wall, quite oblivious of the particular tone complementary to the remaining hues employed. The architectural decorator has most to do with secondary and tertiary scales. Citrons and russets and terracotta tints have all their proper relation with their complementaries, which ought to be present, and the tone of each should be balanced by the other colours to produce harmony. We often see a reddish terracotta without its corresponding complementary, the effect of which mars the whole scheme of colour. One colour happens to be in excess, and the whole harmony is destroyed.

SOUTHWARK LIBRARY COMPETITION.

THE designs now on view at the vestry hall, Borough Market, for the proposed public library are seven in number, and show some good, if not ingenious, planning. As we stated last week, the Library Commissioners have given the first premium to Mr. John Johnson, of Queen Victoria-street; the second premium has been awarded to the design of Mr. H. Hardwicke Langston under the motto "Well Lighted," and the third premium to the design of Mr. S. R. J. Smith under the motto of "Q," but we are not informed which design is likely to be carried out. The site is nearly a square—a corner plot situated between Southwark Bridge-road and Union-street, both of those frontages being open. Mr. John Johnson's design places the main entrance in the centre of Southwark Bridge-road front, with the librarian's entrance at the south end, between which entrances is the committee and librarian's room, 19ft. by 15ft. The public hall is spacious, and the lobby and staircase behind the librarian's room derive their light from a skylight. The newspaper room, 57ft. by 23ft. = 1,311ft. super., is ranged along Union-street on the north side, and lighted by six side-windows, besides one at the end; the lending library is in the rear, 37ft. by 34ft. 6in., with the borrowers' lobby in front of main entrance under the staircase. Glazed partitions dividing these rooms are shown, supported by piers or iron columns, which are also introduced between the news-room and staircase-hall. Coil cases are shown for heating along these partitions, and the tables of newsroom are placed crosswise in two rows, each for ten readers. The lighting of the lending library has been effected by a skylight along the rear portion of the room, and by setting back the west boundary wall on the upper floor, the same wall being carried by iron columns in the lending library—an arrangement that is necessitated by the premises built up to the site on the west side. The first floor shows a large reference library extending over the lending library and end of newsroom, 34ft. by 18ft. and 23ft. by 37ft. A youths' reading-room, 23ft. by 19ft. 6in., occupies the front portion at the corner of the two streets, and a suggested magazine-room is placed over the librarian's room and hall, 33ft. by 20ft., with a bay window over the entrance. The staircase is separated from this room by a glazed partition, and a similar partition separates the reference library from the youths' room.

Although the arrangement is compact, there is rather a cramped landing, and the attendant's room would have been more desirable in a central position below. The second floor is given up to the librarian, except the rear portion, which is roofed over. The front elevation is in an ornate Italian style, with a small clock turret over the entrance, but the fenestration and pilasters have a crowded appearance, and we think too much elaboration has been attempted, as in the angle pinnacle at the corner of streets. The Union-street façade is even less pleasing on account of the drop in the roof level. "Well Lighted," by Mr. H. H. Langston, nephew, we hear, of the clerk of the Commissioner, has a centre public entrance in the main frontage leading to a central square hall, with staircase on the left. On the right hand is the newsroom, 34ft. by 27ft., lighted in front and along the Union-street side. The lending library on the rear side has its entrance and lobby facing the hall, and is 50ft. by 24ft., with windows at the north and south ends, the latter obtained by setting in the outer wall on that side and by a skylight which forms a lean-to on the next floor. The private passage to library in connection with that official's entrance on south side is convenient. On the first floor the reference library occupies the space over the lending library and part of newsroom, and is 41ft. by 39ft. 6in., exclusive of landing out of one corner. In front are the youths' and ladies' reading-rooms. The reference library has a lantern light, besides end windows. The external treatment of brick and terracotta is simple, mullioned windows and gables in front, but the elevations have a bare look. The author puts the cost of the building at £4,000, and £1,000 for fittings. The stepping back of the building in the section on the south side has been resorted to for lighting the lower floors.

Mr. S. R. J. Smith's design, which takes the third premium under letter "Q," has undoubtedly the best plan. The entrance is in front at the Union-street end, with the librarian's at the corner; the entrances and staircases are compactly brought together with side-lights, and there is a step entrance from Union-street down to the basement—a very desirable access, unprovided for by other designs. An 8ft. entrance has the borrowers' lobby on the left hand, convenient for the public use, and the remainder of the front is the lending library, lighted by four wide windows, a wood and glass partition separating it from the newsroom, behind which is kept one story high and top-lighted; the cases and desks are placed crosswise. Opposite the entrance is the librarian's room. The first floor has the reference library in front, lighted by windows on the front and back sides, with a gallery round it, a lantern light being shown over the newspaper room. Above are the librarian's rooms. A spiral staff-stairs and lifts are shown. This design is accompanied by plans showing the fresh-air inlets under windows and foul-air extract flues at the ends, Tobin's tubes, and the gas and hot-water arrangements. The external design of three stories in front is of brick and terracotta or stone dressings. There is an order on corbels on the first-floor story, and an attic and high roof. The character is suitable for a library, the return side being of two stories, and the newsroom behind one story. There are two other well-studied sets marked "Q," by the same author; one of these has a centre entrance and hall arrangement, with the lobby on the left; a newsroom, 1,200sq.ft., on right side; and lending library on the left, top lighted, with librarian's entrance at the left corner of front. The reference library (1,500sq.ft.) above is along the front, with youths' room at back of stairs in Union-street in a return wing. Plain, but artistically treated, brick elevations, with elliptical

headed mullioned windows on first floor, are shown. A tower and turret break the outline. The front is set back over the ground story, forming a lean-to roof in elevation. The librarian's room is placed at end of hall on ground floor, thus insuring supervision. A third arrangement puts the entrance to left of front, with large hall and borrowers' lobby to right. The lending library forms a large square room, with windows in front and to Union-street, 1,200sq.ft., the counter projecting into it. The newsroom is at the back, occupying the whole length, and lighted by lantern, a wood-and-glass partition dividing it from hall and lending library. The librarian's entrance is in Union-street side, and is made to project into the lending library at the corner. The latter room is partly lighted by a lantern in the centre. The elevations tinted show a plain plastered front. "1 in a circle" is an artistic Italian design of the astylar type, of stone, with high-tiled and hipped roof, broken by lofty chimney-stacks. A bold eaves-cornice, with deep frieze in relief underneath, and the grouping of windows and a nice entrance doorway give a picturesque and pleasing effect. The plan has merit; the entrance hall and lobby are in the centre, with newsroom on the Union-street side, and a youths' room on the left of entrance, with a square lending library of one story occupying the south-west corner, lighted through a large circular domical glass roof. The reference library is placed along Union-street, with librarian's office and staircase hall above. The latter would be better on the ground-floor, and the domical roof of lending library would be a source of expense in repairing. "A" is another set of plans, the author of which has unwisely followed the oblique lines of side street in the walls, which spoils the plan. The elevation is not improved by the peculiar circular cornered windows divided by mullions.

It is probable the Commissioners may see fit to revise their decision before any steps are taken.

STABILITY OF WALLS ON SOILS.—VII.

Decrease of Unit-Pressure on Successive Offsets Downwards.

AS the area of each successive footing course downwards increases, the incumbent unit-pressure of their loads decreases in a corresponding ratio. Consequently the projection of the successive offsets, assuming them to be of material of uniform transverse strength, may increase in the proper ratio, or the thickness of the footing course may likewise decrease, as the transverse stress acting on the offsets is less at the bottom course than at the top course of the footings.

Fig. 16 shows a series of four-footing courses, numbered from the uppermost downwards. There is a proportionate increase of unit-pressure upwards from the bottom footing course of the foundations corresponding to the projection of the offsets. If the offsets vary in proportion to correspond with the changes of the unit-pressure on each successively, it will be inversely as the unit-pressure. Thus, if the unit-pressure be double, the projection of the offset would be the one half. It is not usual in ordinary practice to make any difference in the projection of the offsets; but in certain cases of massive walling or isolated piers, foundations for columns, stanchions, &c., the upper courses of the footings are made proportionately thicker than the lower ones. In extensive buildings, using flagstones for this purpose which are quarried at a great distance, considerable economy may thus be effected. The bottom course, in all cases, should be extra thick, on account of the difficulty and uncertainty of at all times securing uniformly solid bedding, especially when it consists of "landings" or flagstones of large dimensions, and likewise because of the weakening effect produced on some kinds of stone, brick, &c., by submergence in moist or water-logged soils.

Ratio of Changes of Unit-Pressure.—For the benefit of the tiro, the following example of the

decrease of pressure downwards on the footing courses may be useful. Assume the wall load W, Fig. 16, acting at its base to be 3 tons per square foot of its area. The position of the section giving this area is indicated by the arrow-point. The area of the cross-section at this point, if it be 2ft. wide, is 2sq. ft. per foot lineal of the wall; therefore $3 \times 2 = 6$ tons of pressure per foot run

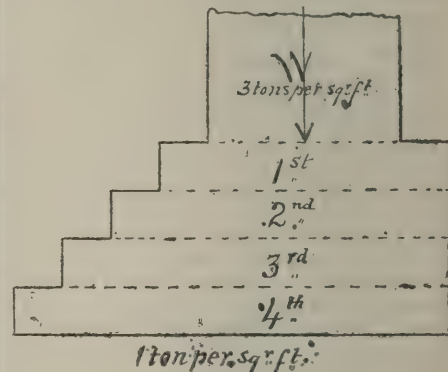


FIG. 16.

of the wall. If the first footing course project 6in. beyond each side of the wall, making its breadth 3ft. lineal, and its area 3sq. ft. per foot run of the wall, then $6 \text{ tons} \div 3\text{ft.} = 2$ tons pressure per square foot over its area. The 2nd, 3rd, and 4th footing course projections add successively 1ft. to 3ft., making the respective footing areas 4, 5, and 6sq. ft. per foot run of the wall. These areas divided into the 6 tons give $1\frac{1}{2}$, $1\frac{1}{3}$, and 1 ton for the corresponding pressures. The above proportions will be seen at a glance in the annexed tabular form. Assume the position of the statical axis of the imposed loads to be indicated by the arrow W, Fig. 16, and that the entire projection of the lowest footing base on the left side of the arrow is divided into six equal parts, two of these projections are in the half-wall, and four of them in the successive offsets of the footing courses.

Area—	Ratio of Base Area.	Pressure in inverse ratio.
Of half-wall.....	= or $\frac{1}{2}$	3 tons per sq. ft.
„ First footing course =	or $\frac{2}{3}$	2 „ „
„ Second „ „ =	or $\frac{1}{4}$	1½ „ „
„ Third „ „ =	or $\frac{1}{5}$	1⅓ „ „
„ Fourth „ „ =	or $\frac{1}{6}$	1 „ „

The projections of the footings on the right-hand side of the figure are similar.

In practice, the proportions of imposed loads to the footing area must be corrected by taking into account the additional loads due to the weight of the materials of which the successive footing courses consist.

Transverse Distribution of Footing Areas.—The pressure of the weight of the wall itself, and of the imposed loads derived from roofs, floors, and special features of the engineering, structural, or architectural design, and from fittings, furniture, storage, live loads, or incidental loads or other source of accumulative weight or pressure, such as the vertical component of wind-force, &c., is discharged upon the footings. The static resultant of this accumulation of pressures marks the static axis of the wall; and when it passes down through the geometrical centre of the wall, the footings should project equally on both sides of the wall; but as this rarely occurs in practice, it is necessary in designing the footings to find the precise position of the statical centre, in order that the footings shall project equally on both sides of the statical plane of the wall. The method of accomplishing this will be considered further on.

Pier Footings.—In the case of isolated pier footings having projections on four or more sides, according to the shape of its horizontal section, the offsets must project equally from the static axis of the imposed loads. The projections must be proportioned to the area resulting from the all-round equal offsets of the successive footing courses when the static axis coincides with the geometrical centre of the horizontal section of the pier; but when, from necessity, arising from any incidental cause, the static axis of the imposed loads is eccentric to the geometric section of the pier, the disposition of the projections must

be governed by the static axis, and not by the geometric centre of the pier.

Rule of Thumb Footings.—It is a common practice in ordinary buildings to project the footings equally on both sides of the lowest portion of the wall as prescribed by the Metropolitan Building By-laws, 1855, first schedule, s. 8, and the Local Government Model By-laws with respect to new streets and buildings, clause 15. The projection of footings, as well as the thickness of walls for various heights and classes of buildings, prescribed as above, adopted at the instance of the late Joseph Gwilt, were based upon rules deduced from the extended observations and deductions of Jean Rondelet of many historic ancient buildings in various countries of Europe.

Story Offsets of Walls.—The usual offsets in the thickness of masonry walls, in brick walls 4½ in., which are made at the top of a story, according to the unsupported length of the wall and height of the building, alters the statical centre of the entire wall from the geometrical centre of the lower portion of the wall from which the footings project. This shifting of the static centre, so far as the wall alone is concerned, is sufficient to make a difference in its static stability when supported by a compressible soil. But, added to this eccentric loading is the difference of the leverage action of the abutting weights of the floors, roofs, &c., which have their bearing on these different receding thicknesses of the wall in the several stages of its height. This geometrical centre of the basement or lowest portion of the wall, which is thus usually taken as the haphazard guide to transverse distribution of the footing courses, is done without any regard to the eccentric leverages imposed by the various sources of loading at the different receding points of their application in the height of the wall. In addition is the further eccentricity which may be produced when the wall is faced with stone or with pressed brick, in either case much denser than the brick backing and filling forming a portion of the structure of the wall, as well as any stone dressings more or less projecting from the face of the wall. Hence the only accurate method to treat the transverse distribution of footings is to ascertain the statical centre of the loaded wall, and to arrange the footings to offset equally on each side of it. The computations for this purpose need not be such an elaborate matter as it would at first appear to the tiro, for the facility increases with the practice of adopting exact methods of estimating, and with their repeated use. Were this done oftener, there would be fewer cases of walls being out of plumb.

Mathematical Rigidity Not Practicable.—In speaking of rigidity with reference to materials of construction, it should be observed that the abstract rigidity of the mathematician, in reasoning about the action of forces upon rigid bodies, disregards all the natural properties of materials. But in applying this line of reasoning to practical structures, the action of the properties of materials through which forces are transmitted or applied, and also the action of the properties of the materials receiving these transmitted or applied forces, must also be considered. All constructive materials are liable to yield more or less to the action of external forces according to their natural properties and the direction in which it is applied, and of the reactions thereto; if transversely, it produces bending (breaking), shearing, and distortion, or, if in a longitudinal direction, it produces stretching (tearing) or contraction (crushing).

Centre of Gravity within Crushing Limit of Supporting Edge of Masonry.—The practical supporting resistance of the materials of the foundation to crushing or rupturing when the weight of a structure is concentrated upon its edge must not be exceeded. In general this is accomplished by keeping the centre of gravity of the mass within the middle one-third of the base. Considerable overhang of a structure may thus take place without incurring danger. Thus, in the case of the Leaning Tower, or Campanile, of Pisa, in Tuscany, the main cornice, which projects 2ft. 6in. from the entablature, overhangs the base 13ft. 8in.—i.e., 1ft. 2in. of a leaning beyond the vertical. The tower is 53ft. diameter at base, and 52ft. mean diameter. The height to the top of the belfry is 183ft. The basement is supported on 15 columns, and is surmounted by six arcades with 30 columns each. Above the top arcade rises the belfry, 27ft. high and about 40ft. diameter, having 12 columns. The main

cornice of the horizontal entablature of the seventh story (counting the lowest story as the first) is therefore 155ft. above the ground level. The overhang of the wall is therefore about one horizontal in 13.88 vertical. The lower story walls are 13ft. thick; the seventh story wall is about half of that thickness. The tower is constructed throughout of marble. The centre of gravity of the wall on the overhanging side is about 5ft. within the edge of the footing. The centre of gravity of the mass is about 17ft. further in, and is about 7ft. out of plumb—that is, it lies within the middle third of the base. To secure stability in the above conditions, the safe supporting power of the soil must not be exceeded. The materials and mode of construction must also be sound and durable.

Bond-stones in Masonry and Brick Piers.—We frequently observe slender piers of brickwork, which sustain heavy loads, to be built without bond-stones covering their entire cross-section at suitable intervals in their height. When there is a maximum unit pressure upon the pier, such bond-stones serve to equalise and transmit the pressure over the entire area of the section throughout its length, and thereby prevent splitting or fracturing. Special care should be taken to impose the loads upon such piers exactly central, so as to be transmitted down through its vertical axis. If loads act eccentrically upon a slender pier, or column, or stanchion, its strength may be reduced to about one-third of its normal strength, which reduction, therefore, may cause failure of the structure, with more or less disaster.

Stability of Masonry Walls: Empirical Deductions.—Stability of buildings depends not only on the stability of the foundation soil for loads acting vertically through the axis of the supporting base, but also on the prevention of loads or forces acting eccentrically or obliquely thereon. This broader condition of stability implies that loads should be centralised axially on the wall or pier, and also that the wall or pier should possess inherent stability of its own to prevent fracture or deflection. Stability of the wall or pier has been empirically assignable by Jean Rondelet in specific degrees, according to the nature of the purpose it is intended to serve. Thus, for the walls of forts, towers, strongholds, stability depends on the massiveness to resist heavy percussion and penetration of missiles and projectiles. For mills, factories, workshops, and buildings in which heavy machinery is in motion, it depends upon a scientific disposition and concentration of the masses of materials at suitable points, so as to readily absorb the vibratory momenta. In dwellings, office buildings, and warehouses the stability of walls is principally dependent upon their ability to resist vertical loads; but in the case of high or prominently exposed structures, it is also liable to the leverage force of wind-storms. Some authorities, as Rondelet, have assigned three classified degrees of stability to independent walls, thus: 1. Those having the least admissible thickness, assumed at one-twelfth of their height, when the stability is not reinforced by cross-walls, floors, &c.; 2, those having a medium safe proportion of thickness to height, which is assumed at one-tenth; and, 3, those having undoubted stability as obtained when the thickness is one-eighth of the height. These proportions are purely empirical. It is assumed that the quality of the materials, the character of the construction, and the class of the workmanship are all of the best for the purpose. The stability of walls also depends on the adequacy of the foundations, and of the supporting power of the soil. In buildings which have cross-walls the Metropolitan Building By-laws, 1855, permit a reduction of the thickness ranging from one-thirteenth to one-sixteenth of the height of the wall.

(To be continued.)

ARCHITECTURE AND BUILDING CONSTRUCTION AT KING'S COLLEGE.

THE younger readers of this journal who are anxious to pursue any branch of their professional education, to qualify for Institute or other examinations, or who wish to complete their knowledge of building construction, will be glad to know of the classes now opened to them at King's College, and something of the facilities for study that are now given at that institution. Considerable additions have been made, as we hinted last week, to the museum and studios of

this architectural school since Professor Banister Fletcher was appointed to the chair. Last year a joint committee was appointed of members nominated by the Council of King's College and by the Court of the Company of Carpenters, and they instituted a scheme which, we believe, has worked well. The Carpenters' Company provided cases of specimens, diagrams, drawings, and wood models, which have been largely supplemented by purchases of valuable casts and drawings by Professor Banister Fletcher. The building trades have liberally contributed to the Museum of Building Construction. The day and evening classes in building construction and architecture have been well attended, and ought to be largely patronised by students. There are also classes for drawing and design, and the Carpenters' Company school for wood-carving ought to be mentioned, a large room being specially equipped for this purpose. Medals, prizes, certificates, and money prizes are annually awarded for these several subjects. The carpenters' and other workshops are replete with tools, apparatus, and models, so that pupils or young men may avail themselves during or after their terms of articledship of these indispensable facilities to learn the special crafts allied to their profession. We recommend every student to obtain the syllabus and particulars of these classes and the prizes that are awarded, which comprise the gold medal of the Carpenters' Company awarded at the end of the course of building construction and architecture in each third year, and Mr. Arthur Cates' annual silver medal.

In looking over the catalogue of the Reference Museum, a new edition of which is just issued, and which shows a collection of over 2,500 architectural illustrations, casts, constructional diagrams, photographs, models, and specimens, a faint idea may be gathered of the extent and scope of the instruction given in architecture and building construction at this college. Professor Fletcher has incurred a large expenditure in selecting illustrations and equipping this invaluable storehouse in which he has been aided by his son, Mr. Banister F. Fletcher. Students desiring a knowledge of the styles cannot possibly do better than consult this museum. The illustrations include plans, sections, diagrams, and casts of each great style—Egyptian, Assyrian, and Persepolitan; Greek, Roman, Romanesque, Byzantine; French, Italian, German, and English Gothic, the Renaissance, Saracenic, Chinese, and Indian timber architecture, &c. These illustrations are all numbered for reference. We do not know where a more comprehensive series of views, plans, and details of all the great Classic temples may be seen, in addition to casts from the actual edifices, of capitals, friezes, panels, and details. What, for example, can be more instructive than the large Doric capital of the Parthenon, and the beautiful Ionic capital from the Erechtheum in the professor's lecture-room?—where may also be seen the cymatium moulding to architrave of the latter, the enriched echinus, the antefixæ ornament from the Parthenon, and a variety of other Greek casts illustrative of the finest period of Hellenic architecture. Drawings and book illustrations may give fair notions, but the full-size cast enables the student to appreciate the actual mouldings in the "round," and the subtle effects of light and shade and reflection. Thus the skylight in the rooms throws the light down upon the capitals we have referred to in the natural manner. Ornament in relief, as in friezes, panels, foliage in capitals, &c., can only be realised to the eye by casts. The English Gothic series of casts contain many of the finest specimens of Norman, Early English, Decorated, and Perpendicular detail, and many of these are hung in the corridors and on one side of the professor's lecture-room. Some fine casts of Renaissance detail from Venice, Florence, and other Italian cities are to be seen, absolutely necessary to the student of this period who has not pursued his studies on the Continent. The constructional diagrams and models form an equally important part of the collection, and these are drawn to large working scales. Thus the details of roof trusses give every part of the construction; the framed floor is equally well explained by enlarged details; and such complicated branches of joinery as boxing shutters, deal-cased frames, panelled doors, details of staircases and hand-rails are illustrated in a manner that no textbook can pretend to do. Complicated timber structures, like timber turrets and steeples, church roofs, domes, and lanterns, and examples of roofs like

those of N. Petherton, Somerset; Long Sutton Church, Guesten Hall, Worcester, Croydon Palace, Staple Inn, &c., are illustrated. Stone, brick, and iron construction and fireproof floors on different systems, including Dennett and Ingle's, Doulton and Peto's, Homan and Rodgers', Lindsay's, Fawcett's, and other recent plans are of immense value to the student. We have before us as we write a very admirable series of photographs just taken by Bedford Lemere and Co., representing the professor's lecture-room, the architectural studio, the corridor, and wood-carving school, which give an excellent idea of the museum and appliances at King's College, including the valuable series of plaster-casts, drawings, and photographs. The models illustrating the elementary operations of building such as bonds of brickwork, floors, roofs, joints in joinery and ironwork, and the specimens of materials, ought to be seen to fully appreciate the practical value of a course of lectures at King's College, where canons of art, precept and principle, of construction are visibly brought to the eye and hand of the student, and where he can "handle and see" what actual construction is.

NOTES FROM EDINBURGH.

THE new Municipal Bill, of which notice is to be given for the coming Session of Parliament, has now been put into nearly final shape, and though it embodies some miscellaneous civic affairs, is mainly an improvement scheme, involving the removal of insanitary tenements upon a larger or smaller scale, widening of thoroughfares, and opening new streets in congested districts. If the provisions sanctioned by the Council are carried out, as they will doubtless be, either under powers obtained by the Bill or the existing Acts for improving the dwellings of the working-classes, the operations resulting will be extensive, going on for six or seven years, and will keep the wages of the builders at their present high-water mark for some time to come. The alterations touch the High-street and districts south of that line, and include no portion of the City on the north. Closes in the neighbourhood of the Lawnmarket will have more light and air, the Cowgate and Westport will be widened at very necessary points, and a new street formed between Earl Grey-street and Gillespie-crescent. These useful changes will not greatly affect the architectural aspect of the portions of the City best known to its admirers; but the improvement at Bristo-street will open up to view the new University Hall, to which the old tenements are in far too close proximity. The amount of expenditure is to be limited to £157,000; but experience of other improvement schemes points to a much larger outlay, which the rates will be called upon to discharge, £8,000 being assumed as the City's share of the annual equivalent grant, and security for repayment of the amount scheduled in course of thirty years. The work under the last improvement scheme, which cost about £400,000, was only recently completed by the erection of tenements in Jeffrey-street. The provisions of the new scheme are, indeed, but an instalment of work that never ends, and many proposals, such as that for widening or rebuilding the North Bridge, purchasing the Music Hall, new municipal buildings, &c., are relegated to a distant future. Sanitary improvements are considered of more essential moment, and it must be allowed that the effect of the last improvement scheme is most encouraging to persevere, the death-rate, with exception of last year, having been reduced from 25 to 18 per 1,000.

The present Lord Dean of Guild, who is a civil engineer of standing and experience, has taken a deep interest in his official duties, and given to the public an interesting historical sketch of this department, and an analysis of its procedure. The new Bill will make provision for remedying some defects of the procedure, and give greater powers to prevent the erection of insanitary houses of smaller size—1,000c.ft. being taken as the minimum for houses of one apartment. The height of tenements will also be better regulated. Nothing is proposed in the way of extending the powers of the court over the details of architectural style. But something might well be done in this direction. The south approach to Edinburgh in the line of Minto-street has always been noted for its ample width and beauty of the fringe of garden ground re-

lieving the somewhat formal range of self-contained villas. This point of vantage is being ruthlessly destroyed by the shopkeeping element, and ere long the whole of the east side will be shut up behind a screen of the most heterogeneous and discordant elevations. Shops and shop-front architecture, generally designed by the contractor, are, as a rule, erected without any knowledge of the style from which details are taken, and many curious specimens are thrust upon the eye, which would be more offensive had the windows no better attractions than their architecture—which is truly the architecture of the window.

Matters at their worst, however, generally mend; and something to good purpose, it is to be hoped, has recently been done to improve the prospects of good architecture and the taste for it in the formation of a new art school, which will stand in the same relation to the similar school now for many years carried on by the Board of Manufactures as the University bears to the ordinary School Board school or others of like character. The attempt to enlist the sympathies of the R.S. Academy in favour of a course of instruction for advanced pupils in the scientific study of art in its varied practical applications utterly broke down. The result has been the formation of this new scheme, which has found sufficient patronage in the way of subscriptions to make a beginning this year. The object in view is to impart information—in the principles of artistic design—in architecture, sculpture, carving, and decorative detail in all the industrial trades. Rooms have been granted by the Board of Manufactures, very suitable for the purpose in view, being the rooms vacated on removal of the Antiquarian Museum to its proper home. Classes will be regularly formed, and occasional lectures given on the higher aspects of the various subjects. Dr. R. Anderson has been engaged to find a good selection of casts, models, &c. The student will have new library and travelling scholarship, and bursaries to stimulate their efforts. The advantages of such opportunities of acquiring information by methods so much superior to the haphazard study of principles of art embodied in a perplexing multitude of books, many of which are difficult to procure, are incalculable, and if the scheme is supported as it deserves to be, there can be little doubt of its meeting a want of which the architectural student has had much reason to complain.

The new University Hall is making progress with floor and roof. The basement chambers, lined with white glazed brick, are completed, with the heating apparatus, consisting of a series of vertical steam-pipes, placed on each side and immediately in front of the space beneath the platform. The ceiling, which is of timber, is only a little way towards completion, and the eye of the dome is still unglazed.

The new West Kirk is so far advanced as to be ready to receive the roof. It bulks much more largely in the landscape than its precursor, which was of goodly size, and with its large apse and transept projections has, from the Mound, a look of St. Peter's about it, which well becomes it as the Mother Church of the modern city. There is nothing in the style finally adopted of very ornate character, and as the walls are well-dressed rubble work from Hailes quarry, with simple white stone dressings, the semi-rural situation of the edifice has been carefully respected, and when completed, the superiority of this method to a design in polished ashlar will be still more conspicuous. Though somewhat low, the site allows of the building being very fairly seen on its upper part from the high level of the streets adjoining.

Another very conspicuous addition to the architecture of Prince's-street is to be seen in a nearly completed state at the other end of the thoroughfare, and arrests the eye, on entering from the Waverley station, by force of contrast to all other architectural elevations. It comprises business premises and shop-front, confined within the narrow limits of one of the old original tenements, with the large frontage of the Edinburgh Hotel one side, and a very much lower one on the other. The style is in the main Late Decorated or Perpendicular Gothic, with great superfluity of surface cusped arcaded decoration, and fantastic arrangements of details, with eaves, cornice, and some other details of pronounced Classical design, built in courses of red and white stone, with crocketed finials shot up into the tops of the windows, which are devoid of

cusps. A large shop-window of elliptic form is the most conspicuous feature of the ground floor, and its arch-moulding has been decorated with Gothic square leaf ornaments—much too large, and looking dangerously near the point of dropping off. The whole speaks more eloquently of the skill of the draughtsman than the designer.

The days appear to have arrived when architects, as well as other trades, must advertise. The Empire Theatre of Varieties, now nearly completed for Mr. Moss in Nicolson-street, is situated behind the street, a huge brick building, but has its entrance to the street emphasised by the erection of a small square tower, with copper dome, in Moorish Gothic, surmounted by a large figure, in heroic size, of what appears to be the tragic Muse. The public are informed in large letters of the fact that Frank Matcham, Esq., London, is the architect. The interior is spacious, and tastefully decorated in so far as plaster-work can make it so.

WOOD VAULTING UNDER RINGERS' ROOM IN THE TOWER, WINCHESTER CATHEDRAL.

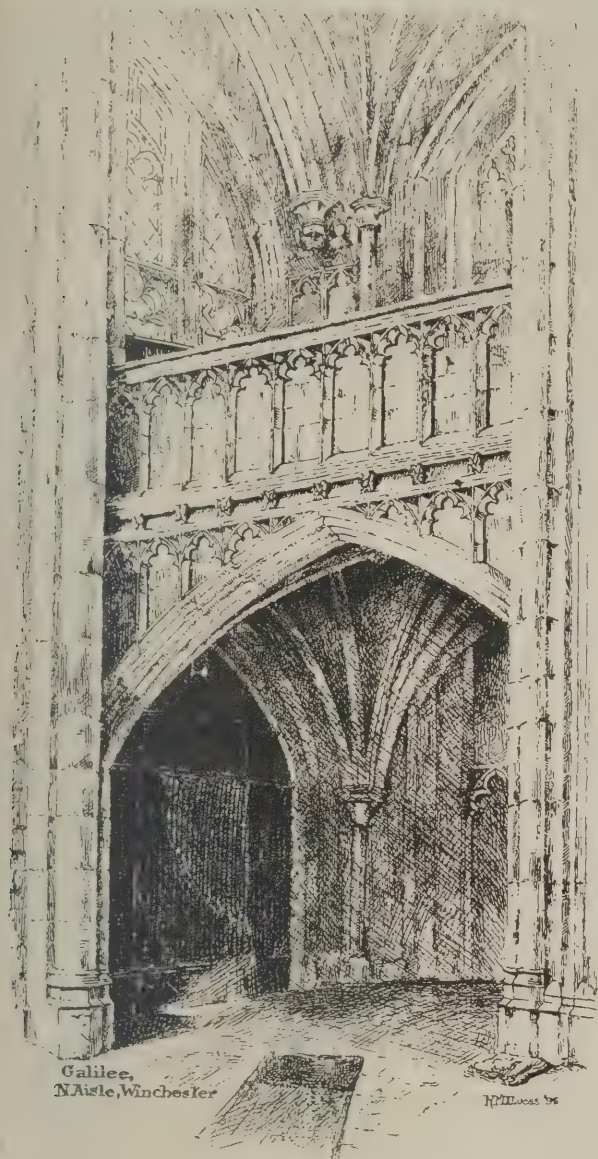
[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

THE date of this vaulting is told in the inscription round the inside of the bell-hole: SINT DOMUS HUJUS PII REGIS NUTRIIT REGINAE NUTRICES FIE (May pious kings and pious queens be the foster-parents of this church), the large letters standing for 1634. The bosses, except two, which are modern, are carved as emblems and memorials of Charles I. and his time. If a suggestion, long ago made by the cathedral architect, Mr. John Colson, were carried out, and the lantern—which now makes a miserable belfry—restored to its original use, this flimsy "chip-vaulting" might be fixed at the

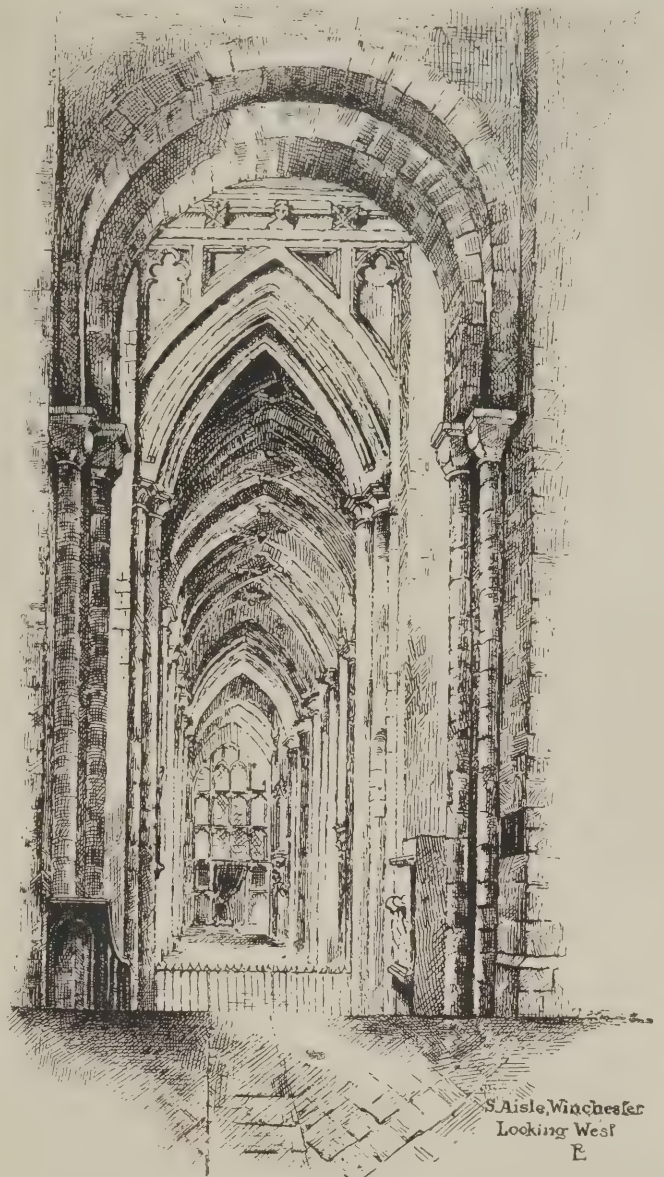


top, in which position the overpowering bosses would be less prominent, and the graceful fan-ribs would spring more freely unstraightened by their badly-fitted panels, whose features would be dimmed, if not lost, at the more distant height.

R. L.
[The words, "threatened with destruction" were inserted on our plate under a misapprehension, and we are glad to find that the information sent us is, so far, incorrect. The vaulting is only to be removed and refixed at a higher level.—Ed.]



Galilee,
N. Aisle, Winchester



S. Aisle, Winchester
Looking West
E

BRICKS AND JOINTS IN BRICKWORK. No. I.

THE writing of these articles was suggested by a recent case at arbitration before Henry Currey, F.R.I.B.A. as arbitrator, extending over three days, chiefly on the subject of joints in brickwork, and in which the writer was a witness. It is only in such cases as the above that a profuse knowledge of in themselves small practical matters are properly valued, a statement advanced lest this and the articles to follow should be thought unnecessarily profuse in detail.

For some few years past the London stock proper has had a rival in the brick market, in the shape of the Fletton brick, advertised as a superior stock brick, the interior work of the General Post Office now building being of these bricks. The first quality of Fletton bricks are unquestionably good, well-finished bricks, possessing the qualities and characteristics in make peculiar to most pressed bricks—viz., density or compactness of structure, weight, sharp well-defined arrises, and well-finished faces, combined with truthfulness of form. These bricks, like most others, vary much in quality, the inferior kinds being known to the practised eye by a condition which in the ordinary London stock brick would be described as "shuffy," derived from the word "shuff," applied to the most inferior class of bricks produced by clamp-firing. The Fletton brick, however, being made under entirely different conditions to that of the ordinary stock, and being kiln-burnt instead of clamp-burnt, is much above the level of the "shuff" proper found in stock bricks. The edges of such of the Fletton bricks are broken

away, the beds of the bricks having a general appearance of a want of cohesion, and when broken in two presenting a loose and frequently a cracked section, showing the bricks to be made from a strong refractory clay, which, in such particular instances, has not been sufficiently pugged, an evidence of which, in the shape of core or stones, is sometimes found in these bricks. The writer has known instances of core in some of the best clays breaking the shafting of the pugging machine during the process of tempering the clay. Mr. Kirkaldy has reported very favourably of the Fletton brick with respect to its resistance to crushing; but for exterior facings, as compared with stock bricks, it has the disadvantage of not having been in use sufficiently long (at least, in the Metropolis) for an opinion to be safely expressed as to its weathering capabilities. It is well suited for interior facings intended for distemper; but for plastered walls its smooth face, the result of being pressed in a metallic mould, does not afford the same amount of clinging surface or "key" for the plastering as an ordinary London stock brick. It may be said that the rough cut mortar joints over the whole area of the wall afford sufficient "key" to uphold the wall plastering in position, irrespective of any adhesion on the faces of the bricks. In cases of this kind it is safest to judge by comparison. Fletton bricks are cheaper than good London stocks, and take less mortar in building, a consideration which accounts for the London builder being an ardent advocate of their use.

Some specifications provide against the use of bats in the walls unless occurring as legitimate bond, which practically means the exclusion of

the use of bats, the cases in which they would be required as legitimate bond being few indeed. The clause may also be understood as one of these conditions or guards with which the architect finds it necessary to hedge himself about when dealing with the modern competitive builder, in some instances remarkable for his astuteness in finding out the weak points of a specification, and bringing his sharp practice to bear on them with a view to prospective extras as a means of pulling him through on a low-priced bill of quantities, and whose idea of building seems to be the throwing together of so much crude or wrought material, as the case may be.

The quantity of bats in a freight of bricks is generally a good criterion as to their hardness, provided the bricks have been loaded fairly from the clamp—that is to say, taken fairly as they stand without sorting. The softer bricks get very much broken in the different operations of handling in transit to the job. Another surer sign of soft inferior bricks is the great amount of brick-dust present in the bottom of the cart or boat when unloading the bricks, due to the attrition of their soft faces, good, hard bricks making little or no dust; a large amount of dust present at once exciting the suspicion of the practical man as to the quality of the bricks. In a recent case at law in connection with the roofing-tile trade it was contended, and ultimately ruled, that $2\frac{1}{2}$ per cent. of defective tiles is the recognised maximum quantity allowed in every freight. A similar rule, by tacit acceptance, we believe applies to the quantity of bats in a freight of bricks—the maximum proportion being two bats to every four unbroken bricks—

or, using a term of the trade, two bats to every "hand of bricks," the bricks, for convenience sake, being handled five at a time, the two bats counting as one brick. In this way 80 per cent. of whole bricks are obtained. The use of bats is often a vexatious question, and the cause of much friction on the building between the representative of the contractor on the one side, and the representative of the architect on the other. A practice of the writer in the supervision of brickwork is not to object to the use of bats if three whole headers intervene between every two bats, by which arrangement 75 per cent. (seventy-five per cent.) of the heading courses are whole bricks. But with every alternate header a whole brick, no danger need be apprehended under ordinary circumstances of building, provided the work be well flushed up every course, for brick walls are seldom, if ever, found to fracture longitudinally, for two reasons—viz., that fractures in brickwork are, as a rule, due to defective foundations, which defects generally show themselves in a direction transverse to the wall; and that the longitudinal bond or lap of the brickwork is only 2½ in., while the transverse bond or lap is 4½ in. The weakness of a wall, and of its foundations, is in a line at right angles to its line of direction, or the line in which the least resistance to fracture is offered. Large walls and piers are too often regarded by the builder as legitimate receptacles of the smaller material of building—an idea not alone peculiar to the bricklayer, nor to present-day practice, but one also held—in some instances at least—by the Medieval builders, who built their great hearts into the sculptured stones, and evidence of which may be seen in the remaining ruins of St. John's, Chester, and in the account of the survey of Peterborough Cathedral by John L. Pearson, in which he assigned the dangerous condition of the tower to be due to the fact that the great piers were little better than cased masonry filled in with rubble or unbonded stones.

PRICES.*—XLIX.

(All Trade Discounts have been taken off, and Profit added.)

IRONMONGER (continued).

ZINC WINDOW PLATES—		£	s.	d.
6 in. wide and flat on face	per ft. run	0	2	3
7 ditto ditto	ditto	0	2	10
8 ditto ditto	ditto	0	3	3
9 ditto ditto	ditto	0	3	8
10 ditto ditto	ditto	0	4	3
11 ditto ditto	ditto	0	4	6
12 ditto ditto	ditto	0	4	16
6 in. wide and convex shape	ditto	0	3	8
7 ditto ditto	ditto	0	3	10
8 ditto ditto	ditto	0	4	6
9 ditto ditto	ditto	0	4	10
10 ditto ditto	ditto	0	5	3
11 ditto ditto	ditto	0	5	10
12 ditto ditto	ditto	0	6	4
6 in. wide and ogee shape	ditto	0	3	8
7 ditto ditto	ditto	0	4	3
8 ditto ditto	ditto	0	4	9
9 ditto ditto	ditto	0	5	3
10 ditto ditto	ditto	0	5	9
11 ditto ditto	ditto	0	6	6
12 ditto ditto	ditto	0	7	6

Engraving and extras the same as to brass plates.

DOOR-PLATES, unfixed—
Brass polished plates, including screw holes.....per sq. in. 0 0 03
Engraving as before.

Mahogany backing, with quadrant edges and screwing plates on, 3s. per square foot; but no charge less than 3s. for a backing.

Zinc plates, polished and including holes, per in. super. 0 0 03

WATER BARS, unfixed—
½ by 1 wrought-iron bar, cut to lengths, per ft. run 0 0 3

Ditto galvanised ditto ditto 0 0 4
Ditto for casements opening outwards ditto 0 0 8
Ditto ditto galvanised ditto 0 0 10
Ditto ditto brass ditto 0 2 6
Comyn Ching's brass water bar each 0 3 4
Ditto copper ditto ditto 0 3 9
Elliot's Simplex, in steel per ft. run 0 2 10
Hill's brass for casements opening inwards ditto 0 5 6
Ditto ditto outwards ditto 0 3 0
Smith and Stevens weather-tight Janus

sill-bar in brass 18 in. per ft. run 0 7 6
Ditto 24 in. ditto 0 6 6

And for every foot longer, 6d. per foot less.

In stoutest metal extra per ft. run 0 1 0
In copper ditto ditto 0 0 6

Fig. 7 extra strong, 12s. per foot run in brass for stone, and 10s. for wood.

Stevens and Co's hook cell bar in iron per ft. run 0 1 2
Ditto ditto galvanised ditto 0 1 7
Ditto ditto brass ditto 0 3 9
Ditto ditto copper ditto 0 5 6

18 in. Adams's patent sill bar for case-ments opening inwards.....		each	£	s.	d.
24	ditto ditto ditto	ditto	0	11	6
36	ditto ditto ditto	ditto	0	13	6
48	ditto ditto ditto	ditto	1	2	9
60	ditto ditto ditto	ditto	1	6	0
72	ditto ditto ditto	ditto	1	7	0
1 in. Diamond corrugated lattice wire-work for windows 18 gauge, fixed..... per ft. super.			0	0	10
1 in.	ditto 17 gauge	ditto	0	0	11
	ditto 18 ditto	ditto	0	0	8
	ditto 17 ditto	ditto	0	0	10
	ditto 16 ditto	ditto	0	0	11½
	ditto 15 ditto	ditto	0	1	3
	ditto 14 ditto	ditto	0	1	4
1 in.	ditto 18 ditto	ditto	0	0	7
	ditto 17 ditto	ditto	0	0	8
	ditto 16 ditto	ditto	0	0	10
	ditto 15 ditto	ditto	0	0	11½
	ditto 14 ditto	ditto	0	1	3
	ditto 13 ditto	ditto	0	0	7
	ditto 12 ditto	ditto	0	0	8
1½ in.	ditto 11 ditto	ditto	0	0	10
	ditto 10 ditto	ditto	0	0	11½
	ditto 9 ditto	ditto	0	1	3
2 in.	ditto 14 ditto	ditto	0	0	7
	ditto 13 ditto	ditto	0	0	8
	ditto 12 ditto	ditto	0	0	9
	ditto 11 ditto	ditto	0	0	11½
	ditto 10 ditto	ditto	0	1	2
	ditto 9 ditto	ditto	0	1	3
2½ in.	ditto 14 ditto	ditto	0	1	1
	ditto 13 ditto	ditto	0	0	6
	ditto 12 ditto	ditto	0	0	7
	ditto 11 ditto	ditto	0	0	8
	ditto 10 ditto	ditto	0	0	9
	ditto 9 ditto	ditto	0	0	11½
3 in.	ditto 14 ditto	ditto	0	0	6
	ditto 13 ditto	ditto	0	0	6
	ditto 12 ditto	ditto	0	0	6
	ditto 11 ditto	ditto	0	0	8
	ditto 10 ditto	ditto	0	0	9
1 in. Diamond tied lattice wire-work fixed, No. 14 B.W.G. mesh . . . per ft. super.			0	1	2
	ditto 13 ditto	ditto	0	1	3
	ditto 12 ditto	ditto	0	1	5
	ditto 11 ditto	ditto	0	1	7
	ditto 10 ditto	ditto	0	1	9
1½ in.	ditto 9 ditto	ditto	0	2	2
	ditto 14 ditto	ditto	0	1	0
	ditto 13 ditto	ditto	0	1	1
	ditto 12 ditto	ditto	0	1	3
	ditto 11 ditto	ditto	0	1	5
	ditto 10 ditto	ditto	0	1	7
1½ in.	ditto 9 ditto	ditto	0	1	10
	ditto 14 ditto	ditto	0	0	10
	ditto 13 ditto	ditto	0	0	11
	ditto 12 ditto	ditto	0	1	0
	ditto 11 ditto	ditto	0	1	3
	ditto 10 ditto	ditto	0	1	5
	ditto 9 ditto	ditto	0	1	9
2 in.	ditto 14 ditto	ditto	0	0	7
	ditto 13 ditto	ditto	0	0	8
	ditto 12 ditto	ditto	0	0	9
	ditto 11 ditto	ditto	0	0	11
	ditto 10 ditto	ditto	0	0	13
	ditto 9 ditto	ditto	0	1	0
	ditto 8 ditto	ditto	0	1	4
2½ in.	ditto 14 ditto	ditto	0	1	9
	ditto 13 ditto	ditto	0	0	7
	ditto 12 ditto	ditto	0	0	8
	ditto 11 ditto	ditto	0	0	9
	ditto 10 ditto	ditto	0	0	10
	ditto 9 ditto	ditto	0	1	5
	ditto 8 ditto	ditto	0	1	9
3 in.	ditto 12 ditto	ditto	0	0	7
	ditto 11 ditto	ditto	0	0	8
	ditto 10 ditto	ditto	0	0	9
	ditto 9 ditto	ditto	0	0	10
	ditto 8 ditto	ditto	0	1	0
4 in.	ditto 12 ditto	ditto	0	0	6
	ditto 11 ditto	ditto	0	0	7
	ditto 10 ditto	ditto	0	0	7
	ditto 9 ditto	ditto	0	0	8
	ditto 8 ditto	ditto	0	0	10
6 in.	ditto 11 ditto	ditto	0	1	0
	ditto 10 ditto	ditto	0	0	6
	ditto 9 ditto	ditto	0	0	7
	ditto 8 ditto	ditto	0	0	9
STRAIGHT Lattice wire-work, with frame and cross-bars fixed—					
1 in. mesh No. 16 gauge		per ft. super.	0	0	11
	ditto 15 ditto	ditto	0	1	0
	ditto 14 ditto	ditto	0	1	2
1½ in.	ditto 13 ditto	ditto	0	1	5
	ditto 15 ditto	ditto	0	0	10
	ditto 14 ditto	ditto	0	0	11
	ditto 13 ditto	ditto	0	1	1
	ditto 12 ditto	ditto	0	1	2
7 16 in. ditto	ditto 15 ditto	ditto	0	0	8
	ditto 14 ditto	ditto	0	0	9
	ditto 13 ditto	ditto	0	1	0
	ditto 12 ditto	ditto	0	1	2
1 in.	ditto 15 ditto	ditto	0	0	8
	ditto 14 ditto	ditto	0	0	9
	ditto 13 ditto	ditto	0	0	10
1½ in.	ditto 12 ditto	ditto	0	0	8
	ditto 14 ditto	ditto	0	0	9
	ditto 13 ditto	ditto	0	0	10
2 in.	ditto 12 ditto	ditto	0	0	8
	ditto 11 ditto	ditto	0	0	9
	ditto 10 ditto	ditto	0	0	10
	ditto 9 ditto	ditto	0	0	11
3 in.	ditto 13 ditto	ditto	0	0	8
	ditto 12 ditto	ditto	0	0	9
	ditto 11 ditto	ditto	0	0	10
	ditto 10 ditto	ditto	0	0	11
4 in.	ditto 12 ditto	ditto	0	0	8
	ditto 11 ditto	ditto	0	0	9
	ditto 10 ditto	ditto	0	0	10
	ditto 9 ditto	ditto	0	0	11
6 in.	ditto 11 ditto	ditto	0	0	8
	ditto 10 ditto	ditto	0	0	9
	ditto 9 ditto	ditto	0	0	10
	ditto 8 ditto	ditto	0	1	1

	£	s.	d.
14 by 12 ash bucket, black	each	0	8 0
14 by 14 ditto ditto	ditto	0	8 6
16 by 14 ditto ditto	ditto	0	9 8
18 by 14 ditto ditto	ditto	0	10 3
14 by 12 ditto galvanised	ditto	0	10 0
14 by 14 ditto ditto	ditto	0	11 3
16 by 14 ditto ditto	ditto	0	12 3
18 by 14 ditto ditto	ditto	0	13 6
24 by 29 by 37 galvanised dust-bin with sliding door to front	ditto	1	3 0
27 by 20 by 37 ditto ditto	ditto	1	9 0
30 by 21 by 37 ditto ditto	ditto	1	14 0
Plain brass sheets from No. 8 to No. 26 gauge	per lb.	0	0 10
Copper sheets in sheets of 4ft. and 2ft. 5lb. to the sheet	ditto	0	1 0
6lb. ditto ditto	ditto	0	0 11
7lb. ditto ditto	ditto	0	0 10
8lb. and over ditto	ditto	0	0 9

Any cutting on these brass or copper sheets extra.

30in. tinned blower for smoky chimney, unfixed	each	0	1 9
33 ditto ditto ditto	ditto	0	2 0
36 ditto ditto ditto	ditto	0	2 4
39 ditto ditto ditto	ditto	0	2 8
42 ditto ditto ditto	ditto	0	3 0
45 ditto ditto ditto	ditto	0	3 4
48 ditto ditto ditto	ditto	0	3 7
51 ditto ditto ditto	ditto	0	4 2
54 ditto ditto ditto	ditto	0	4 9

Add 8d. each for hinging up to 49in. long, and 1s. each for lengths above this.

LIGHTNING CONDUCTORS, unfixed—

Copper cord 1½ circumference	per foot run	0	0 6
Ditto 1 ditto	ditto	0	0 5
Ditto 1½ ditto	ditto	0	0 4½
Ditto 2 ditto	ditto	0	0 4
Ditto 2½ ditto	ditto	0	0 3
Ditto 3 ditto	ditto	0	0 2½
Ditto 3½ ditto	ditto	0	0 2

1 copper-wire lightning conductor, including copper holdfasts and straight terminal points complete, unfixed	ditto	0	1 1
ditto ditto	ditto	0	1 6
ditto ditto	ditto	0	2 0
by 1-12 solid copper flat strip lightning conductor, including all as last	ditto	0	0 10
1 by ditto ditto	ditto	0	0 11
1½ by ditto ditto	ditto	0	1 1
2 by ditto ditto	ditto	0	1 3½
2½ by ditto ditto	ditto	0	1 6
3 by ditto ditto	ditto	0	1 10

Solid copper point with three attractors, copper elevating tube 5ft. long, coupling and holdfasts for steady rod	per set	1	10 0
3in. straining-bolt, with brass insulators and holdfasts complete	ditto	0	5 3
ditto ditto	ditto	0	6 0
ditto ditto	ditto	0	7 3
Annealed glass insulators and galvanised holdfasts	ditto	0	16 6

BLIND FURNITURE, unfixed—

Beechwood ends	per dozen	0	0 6
Boxwood ditto	ditto	0	1 0
1 3in. cast brass ditto	per pair	0	0 3½
2 ditto ditto	ditto	0	0 4½
2½ ditto ditto	ditto	0	0 5
3 ditto ditto	ditto	0	0 6
3½ ditto ditto	ditto	0	0 6
4 ditto ditto	ditto	0	0 7½
4½ ditto ditto	ditto	0	0 11
Cast brass cups, take ends	ditto	0	1½
Ditto ditto	ditto	0	2
V brackets, copper brazed	ditto	0	2
Strong tinned brackets	ditto	0	2
Strong brass ditto	ditto	0	2
D-shaped ditto, extra strong brass	ditto	0	5
1 3in. Cope's patent globular ends and brackets combined	ditto	0	1 8
1½ ditto ditto	ditto	0	1 10
2 ditto ditto	ditto	0	2 10
2½ ditto ditto	ditto	0	2 11
3 ditto ditto	ditto	0	2 2
3½ ditto ditto	ditto	0	2 8
4 ditto ditto	ditto	0	3 0
4½ ditto ditto	ditto	0	3 6
1 3in. Winchester's independent spring roller-blind furniture	per set	0	1 0
2in. ditto ditto	ditto	0	1 2
Endless blind cords, per dozen cords, green, buff, white, or red	per dozen	0	4 6
Harrison's rack pulley, each	from 2d.	to 6d.	
4in. Showell's patent ditto	each	0	4
5in. ditto ditto	ditto	0	6½
China knob, extra	ditto	0	1
4in. Cartland's patent	ditto	0	4½
5in. ditto ditto	ditto	0	5½
Priestland's patent	from 3d.	to 6d.	
"Perfect" rack pulley	each	0	6½
Ditto reeled	ditto	0	7½
Vertical screw pulleys, each	from 7d.	to 8d.	
Hogan spring pulley	each	0	7

CASTORS—			
1in. strong socket castors of burnished brass	per set	0	2 0
1½ ditto ditto ditto	ditto	0	2 4
2 ditto ditto ditto	ditto	0	2 6
2½ ditto ditto ditto	ditto	0	3 2
3 ditto ditto ditto	ditto	0	3 9
1 ball castor (socket)	ditto	0	3 4
1½ ditto ditto	ditto	0	3 9
2 ditto ditto	ditto	0	4 0
2½ ditto ditto	ditto	0	4 8
3 ditto ditto	ditto	0	6 3
3½ ditto ditto	ditto	0	9 6
4 ditto ditto	ditto	0	13 0
ditto (screw)	ditto	0	3 3
ditto ditto	ditto	0	3 6
ditto ditto	ditto	0	3 9
ditto ditto	ditto	0	4 3
ditto ditto	ditto	0	5 9
ditto ditto	ditto	0	9 3
ditto ditto	ditto	0	12 6

SASH LINES—	No.	3	4	5	6	7	8	9	10	11	12
flax sash line, called best ... per 144 yards		0	7	6							
4 ditto ditto	ditto	0	8	9							
5 ditto ditto	ditto	0	11	9							
6 ditto ditto	ditto	0	13	6							
7 ditto ditto	ditto	0	15	0							
8 ditto ditto	ditto	0	16	9							
9 ditto ditto	ditto	0	18	6							
10 ditto ditto	ditto	0	11	0							
3 ditto ditto extra super	ditto	0	15	0							
4 ditto ditto	ditto	0	17	0							
5 ditto ditto	ditto	0	1	1							
6 ditto ditto	ditto	0	1	6							
7 ditto ditto	ditto	0	1	8							
8 ditto ditto	ditto	0	1	12							
9 ditto ditto	ditto	0	1	16							
10 ditto ditto	ditto	0	1	19							
11 ditto ditto	ditto	0	2	2							
12 ditto ditto	ditto	0	2	6							

Metal protected waterproof sash cord for sashes up to 28lb. weight... per doz. yards		0	6	0
Ditto ditto 56	ditto	0	8	0
Ditto ditto 112	ditto	0	10	0
Ditto ditto 168	ditto	0	13	9
Hookham's steel ribbon sash line for sashes up to 40lb. per ft.		0	0	2
Ditto ditto 75	ditto	0	0	3
Ditto ditto 150	ditto	0	0	4½
Above these weights	ditto	0	0	6

(These prices are for not less than 100ft. run.)

1½lb. worsted blind line, buff, green, or blue	per gross yds.	0	5	0
2 ditto ditto	ditto	0	6	0
2½ ditto ditto	ditto	0	7	6
3 ditto ditto	ditto	0	8	10
4 ditto ditto	ditto	0	11	0

Scarlet and crimson 7½ per cent. more.				
1½b. thread lines, flax, duck, or white	ditto	0	3	6
1½ ditto ditto	ditto	0	4	0
2 ditto ditto	ditto	0	4	9
2½ ditto ditto	ditto	0	5	6
3 ditto ditto	ditto	0	6	9

Green or red 7½ per cent. more.				
Sewn ladder tapes for Venetian blinds, brown, duck, or white	per 72 yards	0	12	0
Ditto ditto green or red	ditto	0	13	6
Carr's woven ladder tape, good quality, brown	per 72 yards	0	13	0
Ditto ditto white or duck	ditto	0	14	9
Ditto ditto buff, green, or red	ditto	0	15	9
Ditto ditto extra quality brown	ditto	0	15	9
Ditto ditto white or duck	ditto	0	18	0
Ditto ditto buff, green, or red	ditto	0	19	3

Beaumont's patent Venetian blind action for two cords in iron	per dozen	0	4	0
Ditto ditto for three cords	ditto	0	5	6
Ditto ditto for two cords, brass	ditto	0	6	3
Ditto ditto for three cords	ditto	0	8	6
Marshall's two cord	ditto	0	3	3
Ditto three cord	ditto	0	4	3
Ditto four cord	ditto	0	4	3

SUNDREY—				
Sash weights, cast iron	per lb.	0	0	1
Ditto ditto special	ditto	0	0	2
Ditto ditto lead	ditto	0	0	4½
Greenwood's draught stop in stained wood mouldings	per ft. run	0	0	3
Ditto in hard wood	ditto	0	0	5
Plain beaded vulcanised rubber	ditto	0	0	4
Automatic draught excluder, 2ft. 10in. long, unfixed	each	0	3	9

Add 1½d. per inch in length.				
Slater's draught preventer for doors up to 36in. wide	each	0	6	6
Ditto ditto up to 42 ditto	ditto	0	7	6
Best Scotch glue per lb.	ditto	0	0	9
Ditto French medal	ditto	0	0	7
Glass paper (best)	per quire	0	1	2

ERRATUM.—In No. 49, under iron letters for fascias, those 5in. high should read ½ thick.

A NEW CLOSET-SEAT.

WE beg to call attention to a newly patented closet-seat and bath top manufactured by Messrs. Wright, Sutcliffe, and Son, brassfounders and sanitary engineers, Globe Sanitary Works, Halifax, which possess many sanitary advantages. The closet-flaps are made in mahogany, walnut, pitchpine, or other woods, but the lower flaps of the seats and the surface of the bath tops are covered with a tough, waterproof, non-conducting material freed from all impurities by being subjected to a chemical and mechanical process. The advantages claimed are that the seats are warm, soft, and comfortable, that they are not affected by scouring or washing, are non-porous, durable, and tend to influence a cure in such cases as rheumatism, lumbago, sciatica, hip disease, &c. The tops do not crack, and for baths we should say this soft, non-porous surface must be a boon superior to the polished or varnished wood used for the purpose. The size and shape of these tops can be made to any paper template. Several examples of hinged seats and bath tops are illustrated. These are of polished mahogany, walnut, or pitchpine backs, with side hinges, showing the patented material over the actual seat made to match in colour the wood. Self-lifting hinged seats are also made with lever and weight, and the price ranges from 14s. to 25s. Sutcliffe's patent sanitary w.c. seats and bath tops will be welcomed by all invalids and those afflicted by rheumatism.

PRIZE DISTRIBUTION AT KING'S COLLEGE, LONDON.

THE annual distribution of prizes and certificates to the students in the architecture and building construction classes and the wood-carving classes at King's College, the trade classes at Chapel-street, W.C., and the amateur classes at Kensington, W., took place last (Thursday) evening at King's College, Strand, when there was a large attendance of students and their friends. The chair was taken by the principal, the Rev. Henry Wace, D.D., who referred to the substantial pecuniary aid afforded to these classes by the Carpenters' Company, remarking that had it not been for the support thus given, it would have been impossible for the college to have established evening instruction in building construction, constructional drawings, or the architectural studio. He mentioned that even the outlay on the wood-carving studio had been met by the Company, who also found all the money necessary for carrying it on, including the prizes. He had much pleasure in adding that the Carpenters' Company had promised to allot during the forthcoming year £200 each to King's College and University College.

Mr. Seymour Lucas, A.R.A., then delivered an address to the students, in the course of which he remarked that, as one of the judges, it had given him great satisfaction to note the evident progress of the students at King's College; but he had been particularly struck with the excellence of the work turned out at the Chapel-street classes, where both the models and drawings surprised him by their technical qualities. He then distributed the prizes in accordance with the following list:—

FIRST YEAR.—A. W. Makovski, £4 and silver medal; R. O. Fieldon, £3 and bronze medal; F. Clark, £2; Wearing, certificate of distinction; H. J. Mather, certificate of distinction; W. H. Gurney, certificate of approval; S. E. Trill, certificate of approval.

SECOND YEAR.—Trimmell, £4 and silver medal; Allberry, £3 and bronze medal; E. C. P. Monson, £1; H. T. Adlard, £1; A. G. Dixon, certificate of distinction; T. A. Watson, certificate of distinction; F. W. Bateman, certificate of approval; A. A. Dixon, certificate of approval.

EVENING CLASSES.

ARCHITECTURE AND BUILDING CONSTRUCTION.—S. Jefferey, silver medal and £4; E. C. P. Monson, bronze medal and £3; J. R. Johnston, £2; C. T. Aston, certificate of merit; F. C. Higgins, certificate of merit; T. C. Yates, certificate of merit; H. M. Lawson, certificate of merit.

CONSTRUCTIONAL DRAWING.—C. T. Aston, £3; S. Jefferey, £2; A. C. Long, £1; F. Mayell, certificate of merit; F. C. Higgins, certificate of merit; H. M. Lawson, certificate of merit.

QUANTITY CLASS.—Woodward, £3; E. Searchfield, £2; H. C. Cregeen, £1; S. Jefferey, certificate of merit; J. R. Johnston, certificate of merit; H. Allberry, certificate of merit; P. Ross, certificate of merit.

STUDIO.—Pearce, silver medal; Jordan, bronze medal.

Professor Banister Fletcher, J.P., F.R.I.B.A., in proposing a vote of thanks to Mr. Lucas, gave some encouraging statistics as to the progress that was being made by the classes at King's College. He observed that in the session 1890-91 there were 25 students attending the lectures and 11 in the drawing-classes; these numbers increased in the next year, 1891-2, the session just completed, to 30 at the lectures, 19 at the two classes on construction, 29 at the quantity class, and 4 at the studio. For the new session, that of 1892-3, 38 had entered for the lectures, 30 for the constructional classes, and the applications for the quantity-class, studio, and the wood-carving classes, which had not yet recommended, were all larger than in previous years. The new work for the present year included preparation for the examinations of the Sanitary Institute. Not only were the classes developing, but the library had been increased from 1,300 to 2,500 volumes during the year, and it would be seen that a series of architectural photographs to large scale had been hung in chronological order. He ventured to assert that the King's College Classes now provided all that was necessary for the training of the young architect.

The vote of thanks was seconded by the Master of the Carpenters' Company (Mr. Jacobs), and carried by acclamation, and was briefly acknowledged by Mr. Lucas.

SHADOWS IN PERSPECTIVE.—VI.

WE are now going to study the construction of shadows cast by rays of light coming from before the observer. It is evident that before putting in the shadows of a drawing we have to consider the best effect that can be produced by

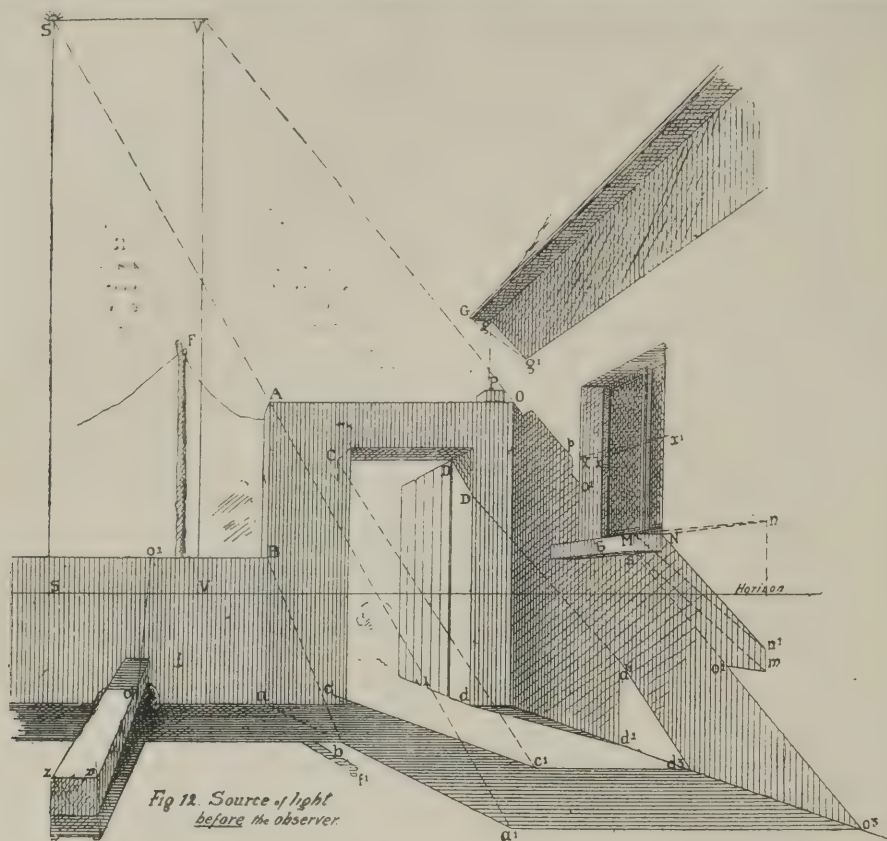


Fig. 12. Source of light before the observer.

their means. We have, as we have said before, three positions of the source of light to choose from: that sending its rays parallel to the plane of the picture, and which we have already studied; the rays coming from before the observer, and, again, those coming from behind the observer. If we have a drawing disposed as in Fig. 12, which we have kept very simple, in order to better explain the construction of the shadows, we will at once notice that shadows found according to the first system would make no effect. If coming from the left hand there would be very little shadow, and if from the right hand the shadow thrown by the building would cover the whole drawing. In this and such cases we will see that if we suppose the source of light to be situated before the observer we shall obtain effective shadows. We will, therefore, suppose the sun to be before the observer, and at any given distance above the horizon. We shall understand at once that the rays of light (unlike those coming parallel to the picture plane) are no longer parallel to each other, but will follow the same laws of perspective as used for the drawing.

Let us first decide the position of the sun, at any distance above the horizon, say at S, Fig. 13. The rays of light striking the angles of the wall A B are, of course, not parallel to each other, but diverge in proportion to the distance of these points from each other. We have in Fig. 13 a surface of wall, A B, at right angles to another wall, X x, and we wish to find the shadow cast by A, B against the ground and wall planes. We must find the projection of S on the horizontal line at s. For the shadow of A a, it is evident that the intersection of the lines from S and s passing through A a will give us the shadow a, a 1 of A a. S, a 1, s is a plane containing the rays of light and passing through A a. Another plane from S s passing through B b would give us the shadow of B b against the ground at b, b 2, the shadow of the crest of the wall, A B, would fall on the ground from a 1 to b 2. But this plane is intersected by the wall X x at B b, the shadow will, therefore, follow the ground as far as the wall at b 1, and from thence be cast against the plane of the wall. But this shadow must itself be in the plane of the wall; we have, therefore, to turn the plane S, b 2, s on its axis, B b, until it becomes one plane with the wall X x. The plane of X x contains the vanishing point, v, the projection of v to V on the horizontal line from S will therefore be the new position of s S, and the shadow line, B, b 1, will be the line drawn from point V, passing through B, and

meeting the ground at b 1 on the horizontal line from a 1. We see, therefore, that the shadow thrown against the wall should be in the plane of the wall, and on the line from point V. If the drawing was put into perspective with two points, one at v and the other to the right, the point V would naturally be on a line drawn from S to the vanishing point to the right.

We will now find the ordinary shadows of Fig. 12, which is in parallel perspective. The

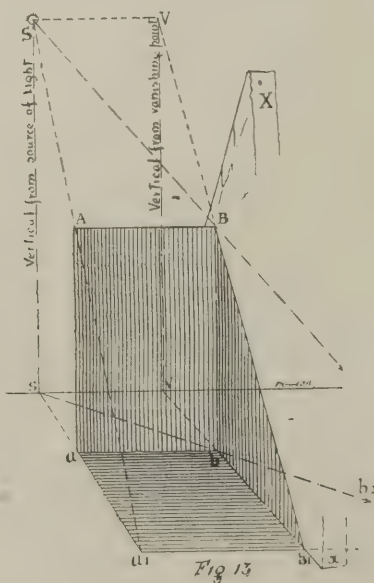


Fig. 13

position of the sun we will suppose to be at S, and its projection on the horizontal line at s, and the projection of the vanishing point v will be at V on the horizontal line from S. To find the shadow of A a against the ground, we must draw from s a line passing through a as far as a 1, and another line from the source of light, S, through A, meeting a, a 1 at a 1. From B a line from S will give us b, the shadow of B; the horizontal from b will be the shadow of the crest of the wall, and b, a 1 that of B A. The shadow of the crest of the wall A O will be the horizontal line drawn from a 1, meeting the wall plane of the building

at o 3, and from thence on the wall to O. o 3, O is the line drawn in the direction V O from the point V. The shadows of the angles of the open doorway are found in a similar manner. The lines from S s passing through the outer angle C c of the doorway meet at c 1, making C, c 1 the shadow of C c. From c 1 we draw the horizontal line c 1 and 3. The shadow of the lintel at D being thrown against the side of the doorway must be drawn from the point V as far as D D, but from D the shadow-line must be drawn from point S, meeting at d 1, the vertical d 2, d 1 drawn from d 2, where the shadow-line drawn from v through d meets the walls. From point d 1 the shadow of D d is against the wall, and must therefore be drawn from the point V, and meets the ground at point d 3. The proof that the construction is correct is that the lines on the ground and wall planes should meet at the same point, as at d 3 and o 3. We therefore see that the point V is not always necessary for the construction of the shadows, for having obtained the points d 3 and o 3 by means of the horizontal lines from c 1 and a 1, we have only to join the different points on the wall plane in order to have the shadows. The use of the point V is, however, always advisable. The shadow of the projecting eaves is found by means of the lines drawn from S and V, passing through G and g respectively, and meeting at g 1; the line from g 1 from the vanishing point completes the shadow. The projecting window-sill intersects the shadow-line O, o 3, and also casts a shadow of its own. The lines from S and V passing through M and N respectively meet at n 1, and give us N, n 1, m the shadow of M N; the line drawn from m to the vanishing point, and meeting s, o 3 at o 2 given us m, o 2, the shadow of the lighted portion of the sill M S. A horizontal line from s beneath the sill will give the point and shadow S (drawn to the point V) on the advanced plane of the sill. The window will be entirely in shadows as seen by the constructional lines X x, x 1. The shadow of the log of wood may be left for the student to construct; the shadow of the crest of the wall will fall on the raised plane of the log at o 1. The pole F f, although appearing well above the wall, will, however, owing to its distance therefrom, cast only the short shadow at f 1. The brick on the wall above the doorway at P casts a lengthened shadow, owing to the slight distance separating the points S and V. It is easily understood that the further the point S is moved to the left the shorter will be the shadow of P, and, again, the greater the elevation of point S the shorter the shadows on the ground will be, and inversely. The position of this point, therefore, should be carefully studied before commencing the shadows of a drawing, in order to obtain the best effect possible. The student would do well to put the Fig. 12 into ordinary perspective by means of a second vanishing point to the right, taking care, however, to notice that the point V will be in that case on the line drawn from S to the second vanishing point.

ARTHUR VYE PARMINTER.

CHIPS.

The annual meeting of the Ruskin Society of London is to be held this (Friday) evening, in the Governor's Room of the Charterhouse, by permission of the master, when Canon Elwyn will point out and describe the chief features of interest in the ancient buildings of that foundation. The programme of this "Society of the Rose" for the coming winter includes some very interesting lectures, which will be delivered at the London Institution.

A subscription portrait in oil of Sir James Maitland, Bart., of Sauchie and Barnton, convener of the county of Stirling, was presented to him on Friday. The portrait, which is a full-length one, has been executed by Sir George Reid, P.R.S.A., and will hang in the council chamber at the County Buildings of Stirling.

Messrs. Maxwell and Tuke, of Manchester, have been selected as the engineers to the Douglas Head Marine Drive.

The memorial-stone of a new Congregational chapel, at Newton Heath, Manchester, was laid on Saturday. The building is situated off Thorpe-road, Newton Heath, with a frontage to Jessie-street. It will be mainly a brick structure, Runcorn sandstone in conjunction with Accrington red bricks being somewhat freely used. Accommodation will be provided for about 330, and the cost will be £1,900. The architect is Mr. S. Fell, of Manchester, and the builders are Messrs. Moore and Son, Eccles.

CONTENTS.

The Decoration of Buildings	517
Southwark Library Competition	517
Stability of Walls on Soils.—VII.	518
Architecture and Building Construction at King's College	519
Notes from Edinburgh	520
Wood Vaulting under Ringers' Room in the Tower, Winchester Cathedral	520
Bricks and Joints in Brickwork.—I.	521
Prices.—XLIX.	522
A New Closet-Seat	523
Prize Distribution at King's College, London	523
Shadows in Perspective.—VI.	523
The Building News Directory	523
Our Illustrations	525
Archaeological	525
Architectural and Archaeological Societies	525
Wayside Notes	544
Engineering Notes	544
Llanelli Town-Hall Competition	545
Obituary	545
Competitions	546
Building Intelligence	546
Correspondence	547
Intercommunication	548
Legal	548
Legal Intelligence	549
Water Supply and Sanitary Matters	549
Our Office Table	549
Trade News	550
Tenders	550

ILLUSTRATIONS.

FIRST PREMIATED AND SELECTED DESIGNS FOR THE LLANELLY MUNICIPAL BUILDINGS.—SELECTED DESIGN FOR THE POPLAR FREE LIBRARY.—WOOD VAULTING UNDER TOWER OF WINCHESTER CATHEDRAL.—HASELEY HALL, WARWICKSHIRE.—RESIDENCE AT TORONTO.

Our Illustrations.

LLANELLY TOWN-HALL COMPETITION.

(DESCRIPTIONS of the premiated design and that actually adopted will be found on p. 545.)

SELECTED DESIGN FOR POPLAR PUBLIC LIBRARY.

THIS building, illustrated by plans, elevations, and sections, is an example of a type of plan differing in some respects from that generally adopted. The site selected has a narrow frontage to the main road, and a large piece of cheap land at the back. The commissioners wished, as we understand, for a building which could be attended to by a very small staff, and decided that all the departments should be on one floor, and commanded from the lending library. Everyone entering or leaving the building will be seen by the attendants at the counter, and each room will be under the observation of the staff at short intervals—when books are being handed out in the reference room, or fetched from the bookcases adjoining the newsroom. Top-lighting is avoided in the rooms for readers, ordinary windows in the walls and windows in a sort of clerestory being preferred. The newsroom is arranged for 100 persons, the size being about 40ft. by 24ft.; the rear portion of the room will have tables for readers of magazines, &c. The entrance to the newsroom is in full view from the entrance-hall. The reference room is about 52ft. by 30ft., giving seats for 100 readers, each being allowed 2ft. of table. The room will be very quiet, as it is out of the reach of the noise of street traffic and of the lending library. The hall will be used for university extension lectures and similar purposes; it will seat about 200 persons. The architects, Messrs. Clarkson, of Great Ormond-street, and 146, High-street, Poplar, have prepared for 40,000 volumes in all. Books are now being collected by the librarian, Mr. Henry Rowbutt, at No. 149, East India Dock-road; a thousand volumes have been presented by Mr. J. Passmore Edwards, the proprietor of the BUILDING NEWS, the *Echo*, and other journals, and we believe further donations will be welcome. The librarian's residence in the new building will be placed next the road in upper floors, and will consist of two rooms, kitchen, and offices on the one pair, and four bedrooms on the two pair story, the entrance doorway being in the next portion of the front next East India Dock-road. That front will be in Portland stone. The building will be wired for the electric light, as that light will be available shortly for the public buildings at Poplar; the heating to be low-pressure hot-water, with boiler in the basement and radiators in the rooms.

WOOD VAULTING UNDER RINGERS' ROOM, WINCHESTER CATHEDRAL.

(See description and further sketches on pages 520, 521.)

HASELEY HALL, WARWICKSHIRE.

SITUATED four miles to the north of the county town, Haseley is a primitive little rural village in the heart of Warwickshire, not without historical associations, and with a population of about a hundred and fifty souls. The Haseley Hall estate, which lies between the estates of Wroxall Abbey and Haseley Manor, and formerly belonged to the late Sir Edward Antrobus, Bart., who was lord of the manor of Haseley, was purchased by Sir James Sawyer, M.D., about two years ago. This beautiful demesne, richly wooded and with picturesquely undulating pastures, adjoins the high road from Warwick to Birmingham, the road forming the western boundary for about a mile. On its eastern side the estate is skirted by a goodly stream, the Inchebrook, which supplies the borough of Warwick with water, and passes its waters into Shakespeare's Avon as a tributary of the Sowe. The extensive alterations and additions have been carried out by Mr. T. Rowbotham, builder, Coventry-road, Birmingham, from the designs, and under the superintendence of, Messrs. Wood and Kendrick, architects, West Bromwich.

RESIDENCE OF D. R. THOMSON, Q.C., LVII. QUEEN'S PARK, TORONTO, CANADA.

THIS house is situated in what might be called "Architects'-row," the five or six residences adjoining being designed by as many different men. The lower portion of the building is of dark brown stone in rock-faced random work, and the upper portion of brick faced with red pressed brick of dark colour. The front is timber-framed, with brick filling in, and the gables of dark red tiles. The exterior woodwork is painted in shades of brown to harmonise with the colour of the stone. The interior is finished in hardwood throughout, the drawing-room in hazel or sweet gum, the hall and dining-room in quartered oak, the library in cherry, and the first and second floors in black ash. The basement is fitted up with a laundry, and contains store-rooms, fuel and boiler rooms. An additional bath-room is provided on the second floor. Every room and hall in the house is heated with hot water, the radiators being indicated by an X and the coils by dotted lines. The boiler is a cast-iron sectional one of the "Daisy" pattern, made in Montreal, being a powerful and economical heater, burning anthracite coal. The following items of cost may be of interest to English readers:—Mason, brick, and plastering, 6,938-80dols.; carpenter and joiner, 6,841-53dols.; tinsmith, 91dols.; slater and tiler, 470dols.; pavement, 132-58dols.; carving at entrance, 20dols.; plumbing and heating, 2,205-29dols.; grates and tiles, 320 50dols.; bells, 47-75dols.; terracotta, 194dols.; painting and glazing, 1,386-47dols.; mantels, 276-78dols.; grading, 28dols.; total, 18,952-70dols. Messrs. Langley and Burke, of Toronto, are the architects.

The theatre at Castleford, Yorks, is being reconstructed from plans by Mr. A. Hartley, architect, of that town, in accordance with the requirements of the County Council for the West Riding. Stone staircases are being provided, also a fireproof proscenium wall and new exits. Messrs. Wilson and Son are the contractors.

The installation of the electric light at Ardrossan Harbour has been completed. It consists of seventeen arc lamps of 3,000 candle-power each, distributed around the harbour and in the coal elevators and Caledonian Railway Station. The dynamo and engine are fixed in the hydraulic engine-house. The work has been carried out by Messrs. Mayor and Coulson, of Glasgow, under the superintendence of Messrs. Strain, Robertson, and Thomson, the Harbour Company's engineers.

On Wednesday last the Bishop of Shrewsbury reopened St. James's Church, Horsley Fields, which has undergone renovation. The work carried out includes the removal of the north and south galleries, and the stone pulpit has been taken down and placed at the south-west angle of the chancel. The enlarged organ has been erected in the bay of the north aisle and the exterior of the building restored. The work has been carried out by Messrs. G. and T. Perry, Wolverhampton, and the alterations to the organ by Messrs. Nicholson and Lord, Walsall. Mr. T. H. Fleeming, Wolverhampton, was the architect. The cost has been £500.

ARCHÆOLOGICAL.

ROCHESTER.—The recent discovery of the foundations of the old east gate of Rochester was discussed at the meeting of the Rochester city council on Wednesday evening, and it was decided to instruct the city surveyor to prepare plans for a subway, the construction of which would enable visitors and others interested to inspect the old tower. The town clerk advised that the city wall was the property of the corporation, and he pointed out that where owners of property had built up to the wall in other parts of the city they had been compelled to pay rent. On the other hand, the clerk to the governors of the Free School holds that the portion of the wall in question belongs to the governors, who have never paid any rent. It was finally decided that the wall should not be pulled down without the consent of the corporation. At the same meeting it was resolved that some important repairs should be carried out in the castle, and a suggestion was made that money should be borrowed to roof it in—the roof not to be visible from the exterior—and that other steps should be taken to insure the preservation of the ruins.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—The first sessional meeting of the Manchester Society of Architects was held on Tuesday week, the president, Mr. Salomons, in the chair. Mr. F. W. Bedford, A.R.I.B.A., read a paper on "Some Account of the Arts in Sicily," which was illustrated by lantern views and sketches. A large collection was exhibited of drawings made during a year's tour in Italy by the lecturer as the Owen Jones travelling student of the R.I.B.A.

CHIPS.

It is the intention of the directors of the Great Western Railway Company to spend £20,000 in enlarging and improving the accommodation at their station in Bath.

The old colours of the First Battalion of the Buffs were handed over to the Dean and Chapter of Canterbury on Monday and deposited in the Warriors' Chapel in the Cathedral. They have been fitted up near the Buffs' Memorial Window.

The township commissioners of Bray, Co. Dublin, are carrying out extensive improvements to the harbour, including the extension of the north and south piers. Messrs. Comber and Strype are the engineers.

On Saturday Lady Margaret Cecil laid the foundation-stone of a new parish mission room in Warington-road, Prescot. The building is being erected at a cost of £1,800. The plans have been prepared by Messrs. Wolfall and Eccles, architects, Castle-street, Liverpool, and Mr. Peter Taylor, of Prescot, is the contractor.

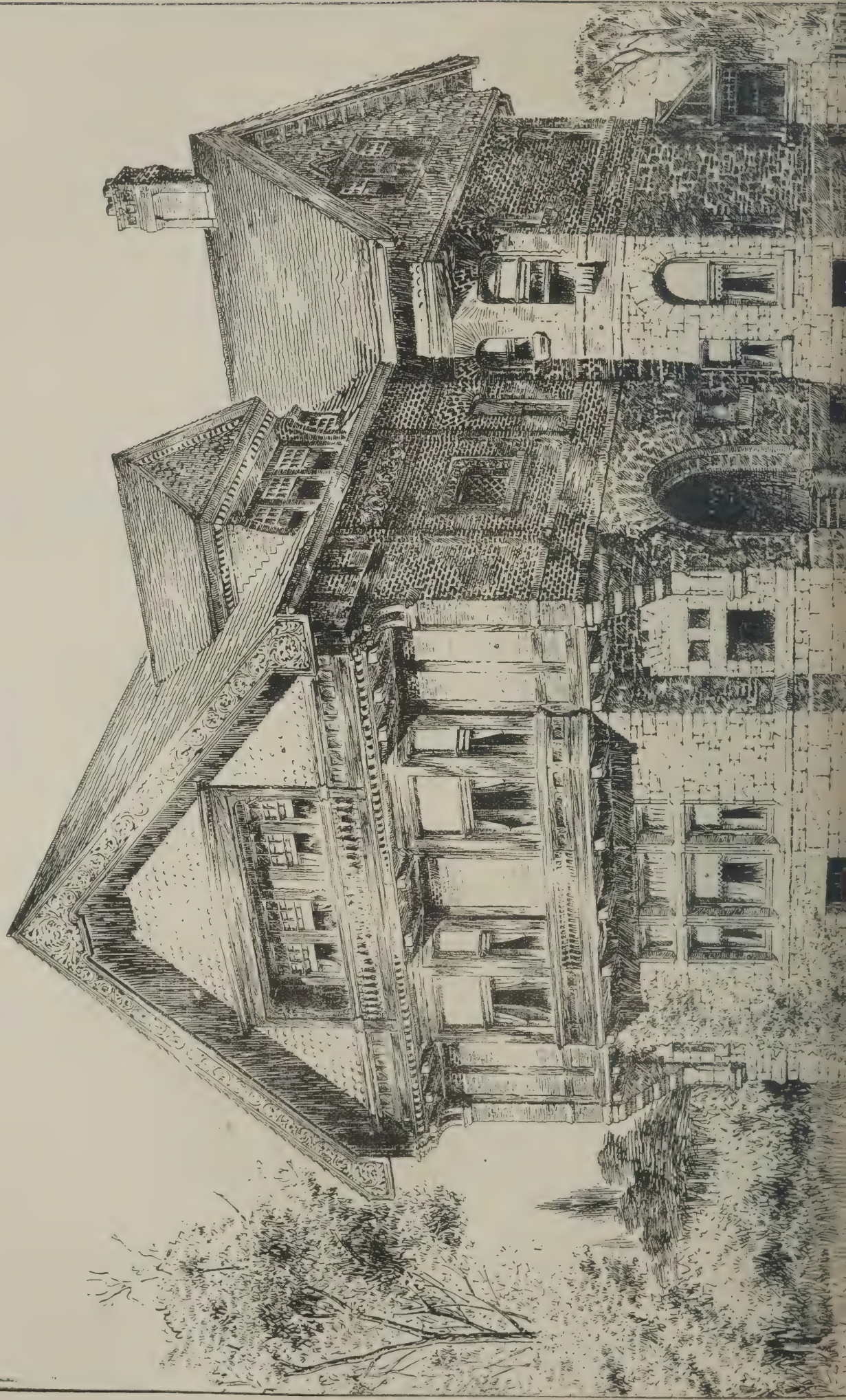
The Corporation of Dublin have decided to promote a Bill in the next Session of Parliament for amending, enlarging, and defining the powers of the Corporation as to borrowing and application of money borrowed, and for confirming and providing for the expenditure of money on the Dublin Main Drainage and on the extension and improvement of the Dublin Corporation Water Works. One of the objects of the measure will be to raise £250,000 for providing artisans' dwellings.

A new bridge has just been erected over the Scottish River Avon, near Blackstone Junction. The bridge has been constructed at the joint expense of the Linlithgowshire and Stirlingshire authorities. It has a clear span of 50ft. and consists of two main lattice girders.

Owing to the serious depression in the South Staffordshire iron trade, the workmen employed by Messrs. Cochrane and Co., bridge and girder manufacturers, Woodside, near Dudley, have met their employers, and, in order to assist them to compete in the iron markets, have consented to submit to a reduction of 5 per cent. in wages all round. The workmen number nearly 1,000.

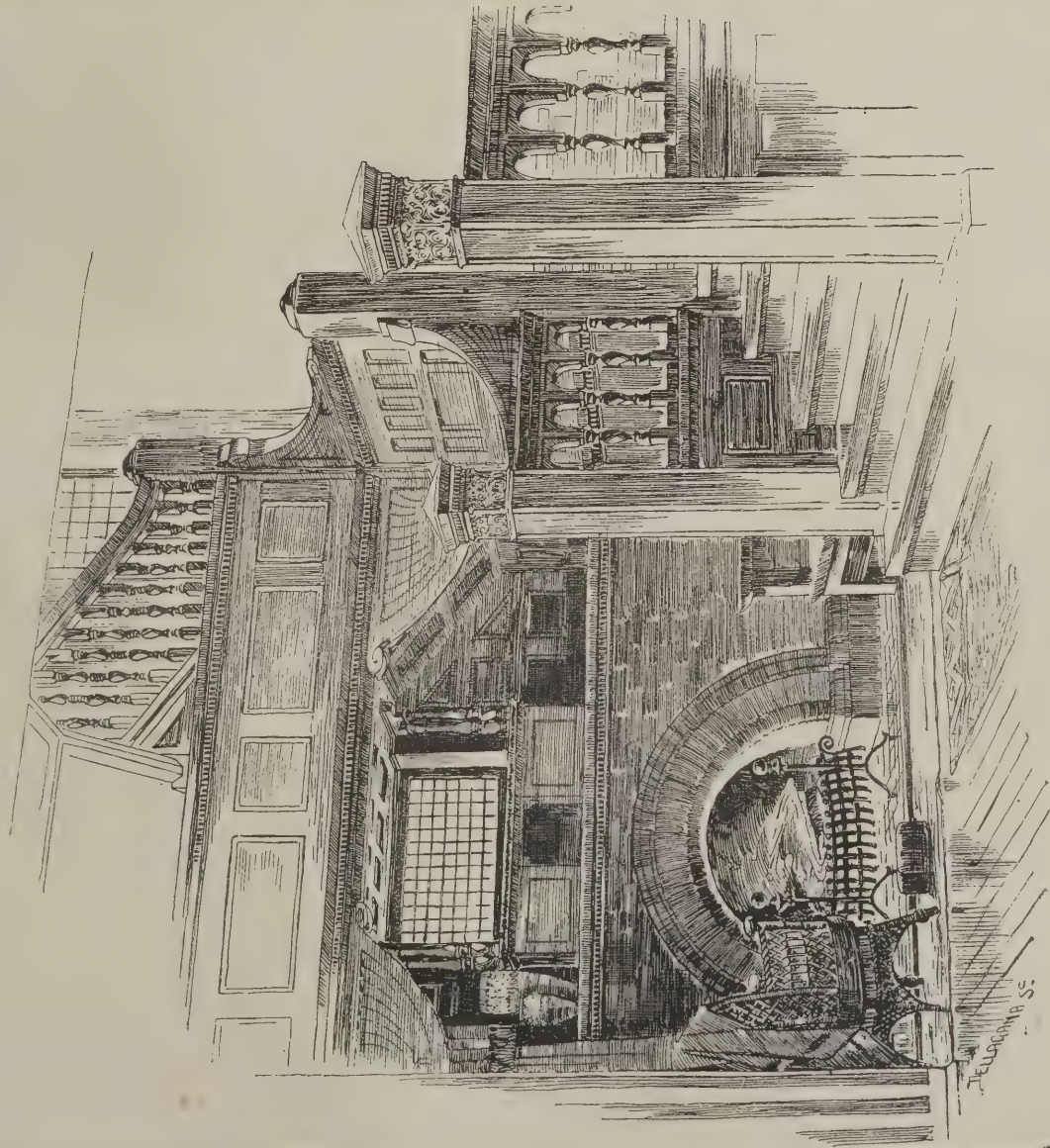
The new public park at Portobello was opened on Saturday. The park, which consists of a field of about sixteen acres, is situated on the north side of the North British Railway, between Hope's-lane and Joppa.

The employees of Mr. James Evans, builder, of Norwich and South Walsham, were entertained at supper last week by Messrs. Charles Havers and Son, ironmongers, in celebration of the roof-raising of their new premises, which are in course of erection from plans prepared by Mr. A. C. Havers, architect, Bank Plain, Norwich.

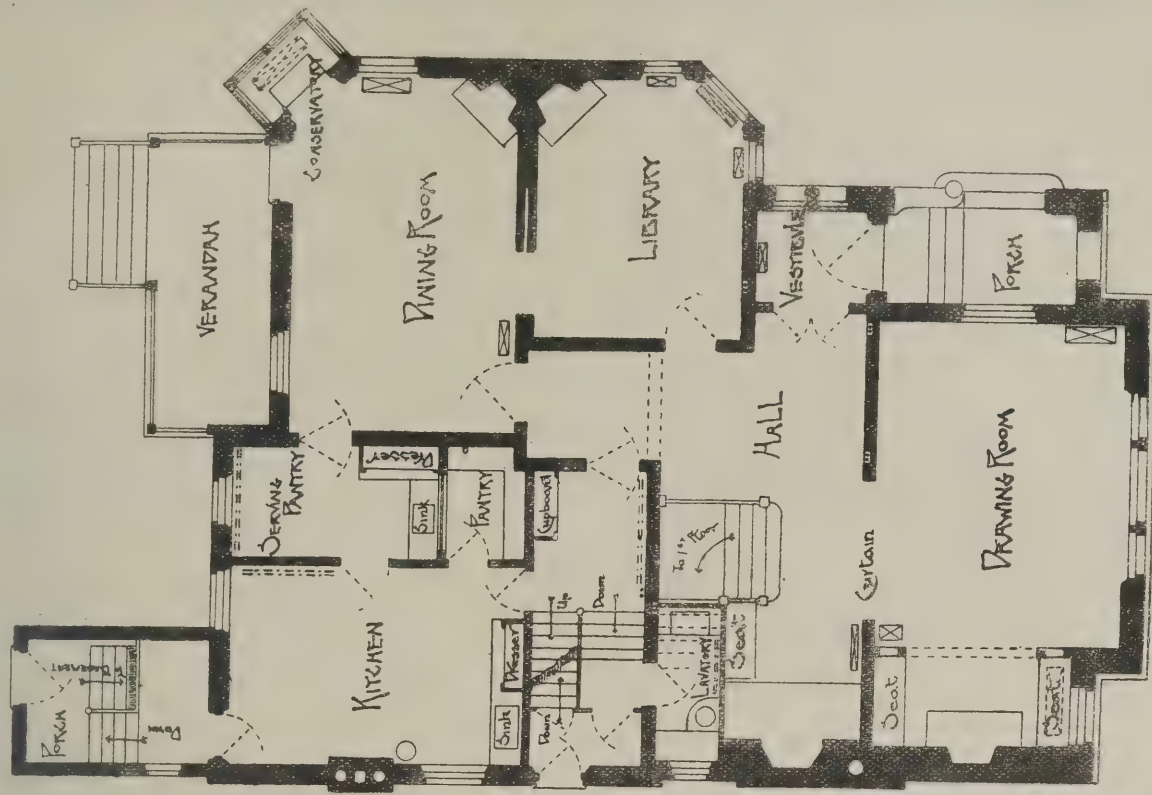


W. H. VICTOR DOND DEL

THE RESIDENCE OF D. E. THOMSON ESQ. Q. C.
AT TORONTO CANADA. MESSRS LANGLEY & BURKE ARCHTS
TORONTO



LANGLEY AND BURKE ARCHTS



GROUND FLOOR.

WAYSIDE NOTES.

TWO new literary works of interest to the architectural profession are about to be published. One is an early effort of Mr. Ruskin to reduce to something like order the ill-defined principles of architectural design, and the other is the promised selection of essays that Mr. Murray has been occupied in printing. The former work will certainly deserve attention, and may perchance contain many practical hints on design for which we look in vain in much of the letterpress of Mr. Ruskin's beautiful book on matters architectural. It may be that we shall not feel any compunction to place implicit faith in the correctness of the deductions made by the author, seeing that the work was produced when he had scarcely arrived at man's estate. But the early impressions of great men have the stamp of genius, and are always interesting. In later—later as to date of production—works, Mr. Ruskin has said much with regard to rules of composition, but the information is of a desultory kind, and generally lost in a vast deluge of beautiful language which, however interesting or instructive, is not, strictly speaking, practical and workaday. In a certain sense, too, Mr. Ruskin has revoked any of his earlier views on the principles of design. I think that it is in a late edition of the "Seven Lamps of Architecture" that there is a footnote to the effect that laws and principles of composition are as nothing compared with the correctness of the workers who have produced the actual building.

There should be somewhat of a thrill in the architectural world at the announcement of the near publication of the essays *re* "Architecture: an Art or Profession." I note that the "Art" comes first in this case, and, like a shadow, would, if we did not already know things, foretell events. I fancy that on the publication of this work all the fat will soon be in the fire, and things will be lively at Conduit-street. Another attack will be made on No. 9, and the Institute particularly harried. If that body frankly avows itself to be an *Institute of Architects*, and neither by title nor special wish an *Institute of Architecture*, its position will remain, as heretofore, impregnable. So long as bread-and-cheese has to be earned in the capacity of an architect, there is ample right to uphold the existence of an Institute of Architects. It may be that the writers of essays on high architecture are above the common necessities of life, and live in an atmosphere of intellectuality. They therefore would fail, naturally enough, to recognise the claims of anything but an Institute of Architecture. In which event the wisest and most consistent course would be to found such an institute which should be kept pure and uncontaminated from contact with common architects and commonplace architecture. And I don't say but what such an institute might not find a great many things in its way that would worthily occupy its attention.

I have a copy of the *Victoria Daily Colonist* for Sept. 13, and therein find a perspective view of "The New Christ Church Cathedral, Victoria, B.C.," Messrs. Evers and Keith, architects. I fear that I have not taken sufficient note of the various illustrations which you have given of this competition, and do not call to mind the nature of the accepted design; but the illustration in the *Victoria Daily Colonist* makes the building, so far as regards its general grouping of features and outline, remarkably commonplace. Of its detail one cannot judge by such a drawing; but I should imagine that it would require a lot of good work to compensate for the apparent lack of originality and ingenuity in its composition. But we must not criticise from data so insufficient as that afforded by a slight and not over-artistic sketch. As to the realisation of the design, I read that the plans have been approved by the general committee, and that tenders will be now invited, while the work of construction will be undertaken in sections. The following will be of interest—uncommon interest, possibly—to the second and third premiated competitors:—"It was resolved that these plans should be finally adopted, and the bonus paid to the successful firm. There was some discussion about the payment of the second and third bonuses, which were on plans prepared in England. It appears that there are certain conditions in the terms of the contest which the competitors failed to comply with. The matter

was referred back to the plans committee, with power to act." It is most probable—unless any have subscribed to a local journal for a season—that this is the first intimation of this meeting of the committee that English competitors will have had, and I should rather like to know how it will strike premiated competitors Nos. 2 and 3.

The Dean of St. Paul's having been approached with reference to the interment of the late Mr. Woolner, R.A., in the cathedral, although expressing personal sympathy with the application, thinks that every perforation of the bed of concrete upon which the cathedral stands involves an appreciable injury to its foundations, and is, therefore, averse to interments within the building as far as possible. One feels strong sympathy with the Dean's views. Some day, perhaps, interments within buildings will be discontinued, and remembered only as one of other barbarisms of olden times. Certainly, interments that interfere with the stability of a fine national monument or cathedral should not be undertaken. We know that the Dean of St. Paul's has every reason to suppose that his views are founded on fact. If St. Paul's floats on a sort of raft or vast tray, it will not do to make any hole in the tray, or otherwise the floating power will be reduced. It is an old tale, this, about St. Paul's, and no doubt worthy of every credence. At any rate, we had best be on the safe side, and not have the Cathedral tumbling about our ears.

Readers will have noticed Mr. Loftus Brock's communication to the *Times* respecting an antiquarian discovery at Rochester. During the rebuilding of the old Free School at that town, now in progress, efforts have been made to trace the form of the old east gate of the city, which formerly stood close to the site of the school, and some excavations made have revealed the form of a huge circular tower, the existence of which had been previously known to a few investigators. Mr. Loftus Brock thinks that it is one of two towers which originally flanked a central gateway, the base of the second tower being supposed to remain beneath the present roadway on the opposite side. The work is found to stand on the ruined wall of a still earlier tower of larger size, the masonry of which agrees with the Norman walling of the castle, and evidence is thus, for the first time, obtained of the existence of masonry defences to the city anterior to 1225. I am glad to hear that the Corporation of Rochester have decided to protect the remains, and render them accessible to those interested.

With the Tower Bridge approaching completion, the river-side residents and others lower down the Thames are naturally thinking that they too should have some means of communication. Another Tower Bridge being out of the question, the County Council Bridges Committee have prepared a scheme for a ferry at Rotherhithe, at a cost of £418,000 the provision to consist of three steamers, each of which will make a round journey in 20 minutes, and capable of carrying 14 vehicles and an "unlimited" number of passengers, whatever that may mean. This scheme of the Bridges Committee received much criticism in council, and has been referred back for further consideration. To us the idea seems useful, and there should be quite sufficient traffic to make the undertaking worth realisation. Tunnels are costly, and apparently difficult things to construct, and more bridges must not be placed across the Thames below the Tower Bridge until, indeed, London has developed into a totally different city.

GOTH.

Engineering Notes.

POLQUHOLICH, N.B.—A new suspension foot-bridge across the Dee at Polquhlich, about two miles above Ballater, was opened on Saturday by the Duchess of Albany. The bridge is the gift of Mr. Alexander Gordon, London, a native of the district, and is of the stiffened lattice girder type. It is 195ft. in length, with a breadth of roadway of 4ft. The height of the roadway above the water is 12ft. The foundations are all of concrete, and go down below the river bed. Those for the towers rise 9ft. above water level to keep the iron superstructure clear of the river during flood. The lattice towers are of steel,

and 23ft. in height. Two 5in. steel iron cables, with a breaking strain of 70 tons, carry the bridge. The roadway is stiffened by two side lattice girders, standing 3ft. 9in. high, while the flooring is covered with wrought-iron chequered plates. Messrs. Abernethy, Aberdeen, were the designers and contractors, and the bridge cost about £500.

THE NEW WIRRAL RAILWAY.—The first sod of the new railway across the Wirral peninsula from Birkenhead to the Dee Bridge will be cut by Mr. Gladstone on Friday in next week. The directors of the Manchester, Sheffield, and Lincolnshire Railway, who are constructing the line, seek to obtain a connection between their system beyond the Dee Bridge and the Birkenhead docks for mineral and goods traffic. For that purpose a main line will be constructed from the Dee Bridge, and will join the Seacombe, Hoylake, and Deeside Railway at a point near the Birkenhead Docks Station. The picturesque but inaccessible district of Wirral will be opened out by the construction of the new line. It is intended to place six stations between Birkenhead and the Dee Bridge, the names of which will be Bidston, Upton, Prenton (or Landican), Heswall, Neston, and Burton.

PROJECTED KETTERING AND RUGBY RAILWAY.—A meeting of the Traders' Association was held on Thursday in last week to consider the advisability of agitating for a second line of railway to the town. A sub-committee had, with Mr. Thos. Hennell, engineer, of London, made a personal survey of the district, and they recommended that there should be a railway from Kettering to Rugby *via* Rothwell, Harrington, Kilmarnock, Naseby, Welford, and joining the L. and N. W. Railway at Stanford; that the railway should have an independent station on the east side of Kettering; and that a guarantee fund of £2,000 be formed to cover the expenses of promoting a Bill for this route in the next session of Parliament. The engineer stated that the line would be about 19 miles in length, and he estimated the cost at about £300,000. The committee's recommendations were adopted.

PROPOSED NEW RAILWAY FROM MANCHESTER TO GLASGOW, VIA NEWCASTLE.—Influential meetings have been held this week in Newcastle and Sunderland to consider the details of a proposed new railway, probably, although the parentage is not yet avowed, an offspring of the Manchester, Sheffield, and Lincolnshire system. According to the plans as explained by Mr. Baker, joint engineer with Mr. Cooper to the promoters, the proposed line will run from Manchester to Newcastle, and on to Glasgow, and it is expected that there will be a saving of about forty-eight miles between Newcastle and Glasgow, and from twenty to twenty-five miles between Newcastle and Sunderland and Manchester. The new line will pass through Darlington, and then through the populous mining district of Houghton-le-Spring, thence to Sunderland. The Wear would be bridged at Deptford, and the line would run *via* Workington to Newcastle, a saving of about one mile and a half, as compared with the present North-Eastern route. From Newcastle, a rich agricultural portion of Northumberland would be served, and Hawick, on the borders of Scotland, on the way to Glasgow. Two bridges over the Tyne are spoken of—one at Hebburn, in order to obtain direct access to the Albert Edward Docks, and the other for the main line higher up the river. It is also proposed that there shall be a loop-line coming through Stockton, Hartlepool, Seaham Harbour, and on to Sunderland. If access can be gained to the docks at Sunderland, a greatly developed business with Yorkshire, Lancashire, and the Midlands would probably result. The project, which is estimated to cost ten millions, will undoubtedly be strongly opposed by the North-Eastern Company, on whose preserves the promoters seek to poach. Mr. Cooper, the joint engineer, is also the engineer to the east-to-west route between Manchester and Sutton, of which the first section is now being made.

In the City of London Court, on Friday, William Barnes, a youth, obtained £175, for injuries sustained in consequence of a defect in the machinery of J. Tyler and Sons, Limited, brassfounders, 2, Newgate-street, by whom he was employed. Both of his arms were broken, one of his legs was dislocated, and it was stated that he would probably be disabled for life. The defence was that the plaintiff had no right to touch the machinery.

LLANELLY TOWN-HALL COMPETITION.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

WE publish both the first and second premiated designs in this competition, awarded in accordance with the report of the referee, Mr. Chas. Barry, F.R.I.B.A. The plans and elevations bear witness to the justice of his award. The second design has been selected for execution by the town council, and Mr. William Griffiths, F.S.I., of Llanelly, is the architect appointed for the work.

Selected Design.—Mr. Griffiths' building is to be erected in the park, and is a free treatment of the Classic style, adapted to the use of the local stone, and aims at a dignified and substantial appearance. The main entrance faces Salamanca-road, and an entrance is also provided on the south side specially for officials connected with the court. The external walls are to be of dressed rock-work of local stone, the dressings and carvings to be of Box Ground. The floors to be fireproof on the Dennett's system, the entrance-hall, portico, and corridors to be laid with marble mosaic, the other floors to be of wood blocks. The ground floor is for the use of the court and rooms in connection therewith. The collectors' department is also placed on this floor, as being most used by the public. The court or town-hall is placed in the centre, being easily accessible from corridors 6ft. wide, and provides, together with the gallery, public accommodation for 300 in addition to the court officials. The hall is lighted by five large windows in the west end and three large lights in the ceiling, with small windows running below the frieze, and, being near the ceiling, can be utilised for ventilation. To the left, and in direct communication with the bench, is the judge's retiring room, and to the right the jury retiring room. The dock is connected to the cells by a private flight of stone steps. The barristers' room, witness room, and solicitors' room are convenient and easy of access to the court. The registrar's offices, with book room, are placed on the north side and in close proximity to the high bailiff's office. Extensive lavatory accommodation is provided both for the officials of the court and the public. The first floor is arranged for the various offices in connection with the Local Board—viz., the surveyor's department (three rooms), the town clerk (three rooms), with a book room for daily use (a large strong room being provided in the basement), medical officer's and inspector's room. The council chamber, 38ft. 3in. by 21ft. 3in. by 16ft. 6in. high, lighted by three large arched windows (the middle one gives access to a balcony), a sub-committee room and waiting-room for deputations, lavatories, &c. The corridors are lighted by top lights. In the basement are situated the photographer's room, strong room, and caretaker's apartments, with direct access to the boiler-room, so as to insure proper attendance to the heating apparatus. The cells and police room are approached by a private entrance on the west side. It is proposed to heat the building by means of radiators, and the ventilation on the Tobin's system, with outlets for vitiated air connected with flues to the main ventilating trunk, and carried along the roof and discharging in the small clock tower.

First Premiated Design.—Messrs. F. W. Simon and Tweedie, architects, of Edinburgh, are the authors of the design placed first. Their report says:—"A central entrance gives access to a spacious vestibule or entrance-hall, from which diverge to the right and left two main corridors, giving access right round the town-hall. The corridor and apartments to the left are devoted to the court business, and those to the right to municipal business. The two departments are thus kept quite distinct, and can be cut off by means of swing doors and glazed screens when the town-hall is used for court purposes only. The main staircase leading to the first floor is centrally placed immediately facing the entrance. On the first floor, again, the departments are kept distinct, and the various apartments are grouped together. The council chamber and the three clerks' rooms and waiting-room occupy the main front. The county court accommodation occupies the left-hand corridor, and the surveyor the right hand. The town-hall is so arranged that it can be used for general meetings, when the dock and the whole of the seating will be removed and deposited in a store in the basement under the hall. From the dock

a staircase leads to an underground passage communicating with the two waiting-rooms or cells for prisoners. These are on the ground level, and can also be approached from the corridor at the back of the hall, and form the yard separating the main building from the caretaker's house. The prisoners' van can be driven into this yard, and prisoners placed in the cells to await their turn in the dock. It was thought desirable to place the caretaker's house on the ground-floor level, forming an annexe at the rear, and grouping with the main building. Thus the inconvenience of placing the caretaker in some remote corner of the roof is avoided, and he has easy access all over the building externally and internally, and full command of the cells and basement. Lavatories and w.c.'s are placed throughout the building in convenient places for private and public use. The design is based on the English Renaissance, which lends itself so well to a picturesque and effective treatment. The buildings externally would be faced throughout with stone, with freestone dressings, the roofs being covered with slates, with ornamental terracotta ridges. The entrance-hall is treated with columns and panelled and decorated ceiling, the staircase being richly balustraded. The corridors and offices will be of simpler design, a richer treatment being reserved for the council-chamber, with high dado, and coffered and panelled ceilings. The town-hall will be panelled to a height of 9ft., and above that be divided into large panels by pilasters with moulded capitals and rich wall-head cornice, from which will rise the elliptical ceiling, richly panelled, and divided by deep moulded ribs, with pendants at their intersection. The construction of the floors will be of steel joistings embedded in concrete, and the roof construction of town-hall will also be of steel. Open fireplaces are provided in all the offices, but the town-hall and entrance-hall will be heated with hot water. Special attention will be paid to the ventilation of the town-hall. A large ventilator is being placed in the centre of the roof with a Bunsen draught inducer communicating with a trunk carrier along the top of the ceiling, with foul-air openings into same at various points. Inlets will be provided for admitting fresh air over hot-water coils. We have carefully gone into the cost of the buildings, and estimate that they can be executed in a first-class manner for a sum of £10,000. With reference to the request to state architects' fees, we take it that the board desire to be assured that the architects' usual fees—namely, 5 per cent. commission on the cost of the building—will be held to cover all charges for professional services from commencement to completion, and that the board only desire to decide the competition on the merits of the plans sent in."

OBITUARY.

WE regret to announce the death of Mr. James Fowler, F.R.I.B.A., J.P., of Louth, the well-known church architect, which took place on Monday. Mr. Fowler had recently recovered from a long illness, but succumbed to a chill taken when on a visit to Grimsby on Thursday last week. Mr. Fowler was born in 1829, and was a pupil of the late J. Potter. He was from 1871 to 1886 diocesan surveyor for Lincoln, and erected and restored a large number of churches, his new works including St. Mary's, Newington, S.E. (see illustration in the BUILDING NEWS for Sept. 24, 1875), Holy Trinity, Wanstead (illustrated by us May 23, 1890), St. Swithin's, Lincoln (a building having a fine spire), St. Andrew's, in the same city, St. Mary's (Lonsdale memorial), Lichfield, and St. Michael's, Louth. Among his restorations may be named St. James's, Louth, Heckington, and Bolingbroke churches, the old Bishop's Palace at Lincoln, Browne's Hospital, Stamford, and Dingley Hall, Northants. He also built the Grammar School and Savings Bank at Louth, Market Rasen School, and built and enlarged the halls at Morton, Langton, and Dalby. Since 1864 he had been a Fellow of the Royal Institute of British Architects, and served on its council 1886-1890. Until this autumn, when ill-health prevented him joining the party at Taunton, he took an active share in the excursions of the Architectural Association, of which body he had been a member for the past eighteen years. Among his published works are "The Ancient Monastic, Ecclesiastic, and Domestic Edifices of Lincolnshire," and "The Churches of the Middle Ages." In the

town of Louth Mr. Fowler was a prominent and highly-respected figure. He filled many public offices in the borough, and five times served as mayor, and on one occasion, in 1886, presented to the corporation a gold mace. He was also warden of the Grammar School, a magistrate and alderman for the borough, chairman of the Louth Court of Sewers, and president of the local Conservative Association. We gave a portrait and biography of Mr. Fowler in our issue of July 4, 1890.

Mr. Thomas Woolner, R.A., the well-known sculptor, and one of the few survivors of the pre-Raphaelite brotherhood, died very suddenly on Friday evening, aged 66 years. Born at Hadleigh, Suffolk, he became, when in his nineteenth year, a pupil of William Behnes, the painter and sculptor, whom he soon excelled both as a draughtsman and an executant. His first exhibit at the Academy was "Queen Eleanor sucking the Poison from Prince Edward"—a work which attracted much attention when shown in 1843—and other imaginative works followed in successive years. In 1850 he joined with Millais, Dante Gabriel Rossetti, and Holman Hunt in originating the short-lived periodical, *The Germ*, to which he contributed several poems, which have frequently been reprinted in later years. The two years 1862 to 1864 were spent at Melbourne, where, among other works, he executed a colossal bronze statue of Captain Cook, now a feature of Hyde Park, Sydney, and the bust of Edward Wilson, of the *Melbourne Argus*, purchased by subscription, and placed in the Public Library of the latter city. After his return, Woolner almost abandoned his idealisations, and confined himself to the more remunerative work of executing statues of public men, and his commissions comprised nearly all the most eminent men of his time. His life-size statues include Lord Macaulay, Sir Bartle Frere, Dr. Whewell, for Cambridge; Lord Lawrence, for Calcutta; Lord Palmerston, for Palace-yard; Lord Frederick Cavendish (a recumbent effigy), for Carmel Priory Church; Bishop Fraser (in bronze), for Manchester; and Lord Chief Justice Whiteside, for Dublin. Among his busts are those of Thomas Carlyle, Cardinal Newman, Charles Darwin, Rajah Brooke, Professor Sedgwick, Sir W. Hooker, Richard Cobden, Sir Thomas Elder, Charles Dickens, Canon Kingsley, W. E. Gladstone, and Lord Tennyson. His most conspicuous failure was the George Dawson statue, for Birmingham, which was removed from its original position; but generally his works were characterised by conscientiousness and thoroughness. He was elected an Associate of the Academy in 1871 and an Academician in 1874, and from 1877 to 1879 he held the Professorship of Sculpture in that institution. His diploma work, executed in 1876, was a figure of Lady Godiva about to mount her horse. He leaves a widow and five children.

The death of Dr. Edward Bickersteth, who only resigned the deanery of Lichfield ten days before his decease, should not be suffered to pass unnoticed in our pages, for the construction and successful completion of the restoration of the west front of his cathedral, effected at a cost of £41,000, under the supervision of Mr. J. Oldrid Scott, were entirely due to his persistent and untiring efforts. Only three weeks since a statue of Dr. Bickersteth, executed some years since by Mr. Ingram, of London, was placed, by order of the Chapter, in the niche that had been left vacant for its reception in the arcade above the west portals of Lichfield Cathedral.

Mr. Charles Macdonald, Froghall Granite Works, Aberdeen, died at his residence on Saturday night. He was an extensive exporter of polished granite to various parts of the world, especially to the colonies. Some time ago Mr. Macdonald, who was much interested in benevolent and educational work, made a gift of a convalescent home, which is maintained at Culter, in connection with the Aberdeen Sick Children's Hospital.

Mr. William Thompson, who had been twice Mayor of Lynn, senior partner in the firm of Thompson, Patrick, and Woodward, timber merchants, died at Glaisdale, Yorkshire, on Tuesday evening, aged 61.

Messrs. E. B. Martin and W. Fiddian have been appointed engineers to the recently constituted board of drainage for the Upper Stour.

COMPETITIONS.

AMBLESIDE.—In the competition for Assembly Rooms at Ambleside, the designs of Mr. Robert Walker, architect, of Windermere, have been accepted by the committee.

NORWICH SCHOOL BOARD.—The above board, at their meeting on Friday last, the 7th inst., awarded the three premiums in the Avenue-road School competition to the authors of plans as follows: First, Mr. C. J. Brown, architect, Norwich (surveyor to the school board), selected to carry out the works; second, £50, Messrs. George J. Skipper, F.R.I.B.A., and F. W. Skipper, architects, Norwich; third, £25, to Mr. W. Landless, architect, Leeds. There were 32 sets of plans submitted.

PADDINGTON.—A very considerable addition is to be made to St. Mary's Hospital, Cambridge-place, on an extensive site in Praed-street, and a limited competition is being held, the following architects having prepared plans—viz., Messrs. H. H. Collins, Henry L. Florence, Stephen Salter, Searle and Hayes, and Keith D. Young. The new buildings will form the Clarence memorial wing. No award has been made as yet, and it is not decided at present who the referee will be. The site is already cleared for the most part, and the buildings when erected will have a very important frontage.

SHEPTON MALLET, SOMERSET.—We understand that in this competition for local board offices and technical school the authors of the selected design under motto "Mid-Somerset" were Messrs. George J. Skipper, F.R.I.B.A., and F. W. Skipper, architects, Norwich. The design placed second, under motto "Merlin," was by Mr. Silcox, of Bath.

STOCKTON-ON-TEES.—At the last meeting of the Stockton School Board, a report by Mr. E. R. Robson, F.S.A., architect to the Education Department, as assessor on the designs submitted in competition for the higher-grade school, was read. Mr. Robson had placed first the designs of Mr. Bottomley, architect, of Middlesbrough, whose motto was "Respect Finem"; Messrs. Clark and Moscrop, Darlington ("Ad Rem"), next; and Mr. Richardson, of Stockton ("Martin Chuzzlewit"), third. The report was adopted.

WALSALL PUBLIC BATHS.—At Thursday's meeting of the Walsall Town Council a resolution of the baths sub-committee was brought forward that the premiums for the three best sets of plans for the baths be awarded—the first to the author of the design bearing the motto "Expert," the second to the author of the design bearing the motto "Mermaid," and the third to the author of the design bearing the motto "Health." The first premiated plans provided for swimming-baths 30ft. by 80ft. and 25ft. by 60ft., with 33 slipper-baths, suite of Turkish baths, and offices; the second for swimming-baths 30ft. by 85ft. and 25ft. by 64ft., with 30 slipper and Turkish baths, and offices; and the third for swimming-baths 30ft. by 82ft. 6in., and 25ft. by 62ft. 6in., with 30 slipper and suite of Turkish baths. The mayor, in proposing the adoption of the recommendation, urged that "Expert's" plan was the best, adding that if it could not be carried out for the specified sum (£7,000) the council would have the right to set the award aside. An amendment was proposed that the assistance of a professional assessor should be got, and it was pointed out that "Expert" proposed to encroach upon the front land, which was to have been sold to bring back part of the purchase-money of the site. Mr. Stead, in seconding the amendment, said "Expert" ought to be disqualified, because certain statements at the end of his paper showed that his name might be ascertained by anyone who chose to look for it. The mayor and others said they did not know the names of the authors of the plans. Mr. Stead said he knew the names of two of them, and an alderman said the names were generally known. Mr. Hughes added that the remark at the end of the paper was that "Expert" had within a certain number of years designed the Camberwell Baths, and all that was needed to find out the name was to refer to the professional journals. Mr. Baker considered that the borough surveyor, whose opinion had been taken, ought to be regarded as a professional assessor. Considerable discussion followed, but the amendment was rejected by 23 to 2, and the motion was carried by 22 to 3. The sealed letters were then opened, and the successful competitors were found to be: "Expert," Mr. Horace T.

Bonner, 29 and 30, King-street, Cheapside, London; "Mermaid," Mr. H. H. McConnell, Walsall; "Health," Mr. Samuel Loxton, Walsall. The premiums awarded were fifty, thirty, and twenty guineas respectively, and 25 sets of plans were submitted. The general purposes committee were empowered to consider whether either, and if so which, of the plans should be carried out, and whether any modifications should be made.

WIDNES.—The special committee of the Widnes Local Board, acting on the advice of their assessor, Mr. Hartley, of Liverpool, have awarded the design of Messrs. Woodhouse and Wilmoughby, of Manchester, the first premium for the proposed free public library and technical school. The second premium has gone to Messrs. Briggs and Wolstenholme, Blackburn, and the third premium to Mr. C. O. Ellison, Liverpool. The competition was an open one.

CHIPS.

On Thursday morning in last week a fire broke out at the large builders' yard of Messrs. Hayward and Wooster, Walcot-street, Bath, the firm whose tender for constructing the new municipal buildings in that city was recently accepted. A large workshop, used by joiners, and stores underneath, having a frontage of 100ft., was the seat of the fire, and this building was totally destroyed, while an adjoining smith's shop, a quantity of valuable timber, and some machinery were burnt. Messrs. Hayward and Wooster estimate their loss at £3,000, but it is covered by insurance. No cause for the outbreak is known.

Mr. C. E. Savery, M.S.A., has just completed the designs for screen and reredos to be erected at St. Peter's, Keighley, Yorkshire.

We understand the Roundhay Electric Tramway Co., of Leeds, have instructed Mr. Wm. Landless, architect, of Leeds, to get out the necessary plans in connection with the introduction of the system in a large town some distance north from Leeds.

A new eight-days illuminated turret striking clock has been presented to the new Market Hall, Gainsboro'. The makers are Wm. Potts and Son, of Guildford-street and Cookridge-street, Leeds.

The new Catholic Schools, Hull, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

The tender of Messrs. Atherton and Latta, of Poplar, amounting to the sum of £18,000, has been accepted for the erection of Ward's School for Girls.

The new church of St. Augustine, situate in Queen's-road, Newland, Hull, was opened by the Bishop of Beverley on Monday. The architect is Mr. G. Gilbert Scott, F.S.A., and the edifice consists of one wide nave and one aisle. It is in the Late Decorated style, built of brick, with stone facings, and the arcades are of red Hollington stone. The interior roof is of pine, of parabolic shape. A chamber and gallery are constructed for the organ on the north side of the church. The tower is a massive structure; but want of funds prevents its completion at present. The seats are of pitch-pine. The cost was nearly £7,000.

The enlarged Technical School at Burnley was formally opened by the Mayor on Monday. The scheme has been carried out by the corporation, acting in concert with the directors of the Mechanics' Institute. About two years ago a new wing was added to the latter, at a cost of £7,000, providing a series of class-rooms, replete with all modern appliances, and now by the Technical School accommodation will be found for 500 more students, making about 1,400 in all. The school is in the old municipal buildings, which almost adjoin the Mechanics' Institute, and the whole of the interior has been reconstructed. The building is two stories in height. The cost of the newest alterations is nearly £4,000.

The London County Council adopted, on Tuesday, after a long discussion, an instruction to a committee to prepare a Bill to obtain Parliamentary powers for constructing a ferry across the Thames between Rotherhithe and Ratcliffe, the actual expense being estimated at £418,000. The subject will, however, come up again at the next meeting of the Council. It was also decided to widen the northern approach to the Woolwich Free Ferry, at an estimated cost of £31,000.

New printing works are in course of erection at Ashford, Kent, for Messrs. H. D. and B. Headley, by Mr. Henry J. Jeffery, M.S.A., architect and surveyor, Ashford, and Mr. Knock is the builder. Satisfactory progress has been made, and it is expected the building will be finished by the end of this month.

Building Intelligence.

DARTFORD.—The Roman Catholic Bishop of Southwark has recently visited the Industrial School kept by the Presentation Brothers and laid the corner stone of the new chapel. The building will be of 13th-century character. Brick will be used throughout for the exterior, and the roof will be slates, and the plan consists of a nave 53ft. long by 26ft. 6in. wide, and a chancel 23ft. by 17ft., separated from the nave by a simple moulded arch. On either side of the chancel will be two smaller arches, opening into recessed spaces for the stalls of the members of the Brotherhood. The roof of the chancel will be boarded and panelled with moulded ribs, at the intersection of which will be bosses. The altar will be reached by three steps above the general chancel level, and will consist of a simple stone mensa, gradine, and retable, above which will rise panelled and decorated reredos, surmounted by a projecting flat panelled baldachino over the altar. The floors will be laid throughout with wood-block paving. There will be ventilation on the Boyle's system, and the warming will be effected by steam, in connection with that of the rest of the buildings. The architect is Mr. Frederick A. Walters, F.S.A., of Westminster.

DUBLIN.—The new fish and vegetable markets will be opened on the 1st of November next. Outside the markets a large staff of corporation workmen are at work in widening Mary's-lane to 40ft. There are three entrances on the Mary's-lane side, one at either corner, and the central or principal one directly opposite Halston-street. The latter is of the Corinthian order, with columns, capitals, and entablature, surmounted by two figures representing Justice and Honest Trade. In the centre are the city arms. The markets are 330ft. long in the clear, with a width of 195ft. The area is spanned by eight comparatively low roofs, which are supported on 56 cast-iron columns and malleable iron girders. The floor of the markets is divided into ten large beds, which are concreted. The markets are crossed longitudinally and transversely by a couple of leading roads for carts, with a roadway across each end for vehicles delivering produce. Refreshment rooms, separate, have been provided for men and women and lavatory accommodation is also furnished. The superintendent is provided with a house and stores. Hydrants are provided all over the floors, with a supply of water for cleansing purposes. The work has been carried out under the supervision of the borough surveyor, Mr. Spencer Harty; Mr. Wilson was the architect, and Messrs. William Connolly and Son, of Upper Dominick-street, were the contractors. All the iron-work was executed by Messrs. Lysaght, of Bristol.

HARTLEPOOL.—The first section of the restoration of the tower and buttress of St. Hilda's Church, Hartlepool, has just been completed. It consisted in underpinning the tower and buttresses. The tower foundations were found to consist of round boulder stones, evidently taken from the sea-shore, and thrown in with nothing but loose soil to serve as mortar. It is not surprising that with such a foundation the tower soon after its erection (early in the 13th century) should begin to show signs of weakness. To rectify this defect, the six massive buttresses seem to have been built, but their foundations were little, if any, better than those of the tower. The foundations of the southern buttresses were made up of worked stones, filled in with soil. Amongst them were found several pieces of moulding of great interest and beauty. The foundations of the northern buttresses were of quite different material, apparently taken from the rocks on the coast, filled up with small stone chippings without any mortar. The work which has just been completed has been to take out a few feet at a time of the old rubble foundation, and to substitute for it a sound foundation of hard bricks and cement. The whole area has in this way been covered, the new foundations resting upon the rock. In order to accomplish this it was found necessary to excavate to a depth of from 6ft. to 8ft. Mr. C. Hodgson Fowler, F.S.A., of Durham, is the architect, and Mr. T. Carse has superintended the works as clerk of works. The second section of the restoration is the opening out of the eastern arch of the tower, and repairing the groined ceiling in the tower.

MORLEY, YORKS.—The foundation stone of the

Municipal Buildings was laid on Saturday by the Mayor. The buildings will comprise Municipal Offices, Town-hall, Council Chamber, Borough Court, and Police Department. The site is bounded on the east by Queen-street, on the south by Albion-street, on the north by Wellington-street, and on the west by a new road, 30ft. wide. On the ground floor there will be, on the left of the principal entrance, the town clerk's and borough accountant's offices, to the right the borough surveyor's and nuisance inspector's offices; along the north corridor are to be the borough court, magistrate's retiring room, and magistrates' clerk's rooms, with the witnesses', solicitors', and magistrates' clerk's office to the rear. The town-hall is to be on the first floor at the south-west corner, and will be 90ft. by 46ft. and 36ft. high. At the northern end will be an orchestra the full width of the room, under which are to be retiring rooms, at the opposite end a large gallery, with a balcony on each side, the total accommodation being for 1,200 persons seated. The second floor will have a large waiting hall or gallery, giving access to all the rooms. On this floor will be the reception room, with a small committee room attached, the council chamber, with councillors' ante-room and retiring-room and Mayor's parlour, with waiting room and large committee room, the latter being connected with the reception room by folding doors. On the lower ground floor rooms are being provided for the different municipal departments. The police department is to the north, and immediately under the magisterial portion on the floor above. A doorway from the prisoners' corridor will lead to an exercise ground. At the north-west corner will be the caretaker's house. Underneath a portion of the large hall will be the minor hall, to seat 600 persons, 70ft. long, 46ft. wide, and 16ft. high, with a platform at one end. A general kitchen will be provided, with scullery attached, constructed in the roof, on the south side. It is proposed to heat the large rooms by hot water on the low-pressure system, and the offices with open fireplaces. The whole of the ashlar used in the building is to be from the Morley Quarries, lined with brick throughout. The designs from which the building is being erected were prepared by Messrs. Holtom and Fox, of Dewsbury, and were selected from a number of competitive designs sent in. The contractors, and the amounts of their contracts, are as follows:—Masonry, Messrs. J. Schofield, Sons, and Co., Leeds, £12,456; plumbing, Mr. Thomas Storey, £890; joiners' work, Messrs. James Clegg and Son, £3,084; plastering, S. Johnson and Son, Mirfield, £1,060; ironwork, Messrs. Firth and Clay, Dewsbury, £348; slating, Messrs. J. Atkinson and Sons, Leeds, £288. The total amount of the contracts is £18,126. Mr. Henry Clarke is the clerk of works.

NEWCASTLE-UNDER-LYME.—St. George's Church has just been reopened, after undergoing restoration. The church, when built in 1828, had but a small recess to receive the communion table. Ten years ago, amongst other alterations, the floor of the easternmost bay of the nave was raised two steps, and had choir-stalls placed upon it to form a chancel. The objects of the present alterations have been to emphasise the chancel organ-space and the south aisle of the chancel, and to render the church more bright and comfortable. Wood vaulted ceilings have been substituted for the plaster ones over the chancel organ-space and south aisle of chancel, and these are divided from the plaster ceilings of the nave and aisles by wood traceried trusses. Over the communion-rail a traceried stone arch has been erected, and a wood ceiling has also been put over the communion end of the chancel. To still further form the chancel, oak screens have been erected, inclosing the south aisle of the chancel. The reredos-framing on the east wall of the chancel has been continued as wall-panelling along the north and south walls; in it are formed a credence niche and a sedilia, and the walling above has been lined with stone. New stone tracery has been inserted in four windows on each side of the church, and these windows, with two exceptions, have been filled with new leaded glazing, having coloured borders, and filling in to tracery. One of the excepted windows will be filled with stained glass. The interior walls and ceilings have been painted and decorated. A new stone porch is being erected on the south side of the church. The painting and decorating has been done by Mr. Wellings, of Newcastle. The screens, alterations to organ-case, and the

wall-panelling (all in oak) are the work of Messrs. Edwards. The whole of the other work has been executed by Mr. T. Godwin, of Hanley. Messrs. R. Scrivener and Sons, of Hanley, were the architects.

PAIGNTON.—The High Sheriff of Devon laid on Friday the foundation stone of St. Andrew's Church, Sans-road, Paignton. Messrs. Fulford, Tait, and Harvey, of Exeter, are the architects of the church, the first portion of which is about to be erected. The contract for this section, which comprises the sanctuary, choir, morning chapel, priests' and choir vestries, and base of tower, was secured by Mr. E. P. Bovey, of Torquay, for £2,562. The cost of the whole building is estimated at £6,550. The style is French of the 14th century. When completed, the church will accommodate 600 persons, in addition to the clergy and choir. The building will be executed in local red rock, with Box Ground stone dressings externally, and Ham Hill stone dressings internally. The flooring of the chapel and vestries will be of wood blocks, and that of the chancel will be laid in marble mosaic, while the steps to the sanctuary and the columns supporting the arches will be of Devonshire marble. Behind the altar space is provided for the erection of a reredos at a future time. The roof over the chancel and morning chapel will be of oak, while that portion of the latter which is situate in the tower will be covered by groined stone vaulting. The building will be heated with hot water, the chamber for which is included in the present contract. Mr. J. Pullen is clerk of the works.

CHIPS.

The east window of the chancel of Uppingham Church has just been filled with stained glass, representing the Ascension. The outlay has been £375.

The foundation-stone of a new Baptist tabernacle has been laid in Templemore-avenue, Belfast. The building when completed will accommodate 500 persons. The cost is estimated at about £2,500.

It is proposed to construct a vehicular bridge across the Mersey from Widnes to Runcorn. The corporation of Widnes have decided to seek Parliamentary powers to enable them to contribute £30,000, conditional on the town of Runcorn contributing a similar amount. The Lancashire County Council and the Cheshire County Council will also contribute towards the undertaking.

The Free Library at Whitechapel will be opened by Earl Rosebery on Saturday in next week, the 22nd inst. Mr. Arthur Hemmings, of the firm of Potts, Sulman, and Hennings, is the architect.

Mr. Joseph Rideal-Smith, architect, Craven Edge, Hopwood-lane, Halifax, has had the misfortune to fall down the bedroom stairs in his house and fracture his collar-bone. Mr. Smith is progressing favourably.

The town council of Hyde, Lancs, have decided this week to co-operate with the council of the local Mechanics' Institute in providing plans for a proposed technical school, the total cost of the works not to exceed £7,000.

On Saturday, John Farley, builder, of Truro, applied to Judge Granger at the Truro Bankruptcy Court for his discharge. His Honour said the Official Receiver had reported very strongly against the debtor, stating that the bankrupt had committed several defaults, and that his conduct had generally been most unsatisfactory and reckless. The discharge would be suspended for four years.

An extension of dressmaking premises in Coney-street, York, was opened on Monday. The façade of the new building is French Renaissance in style, and has a central oriel window carried from the first floor to roof level. The first floor is arranged as show and work rooms, with, at the rear, a dining-hall, having an open-timbered roof, and on the floors above are dormitories. Mr. W. G. Penty, F.R.I.B.A., of York, is the architect, and the chief contractors were Mr. T. Rawling for brick and stonework and Mr. G. Mansfield for joiners' work.

At St. Paul's Church, Wolverhampton, a memorial stained-glass window was unveiled last week. The subject is "Dorcas," and the artists were Messrs. S. Evans and Sons, of West Smethwick.

Steady progress continues to be made with the erection of the Blackpool tower. Messrs. Maxwell and Tuke, of Manchester and Bury, the architects and engineers, report that two of the tower legs are now erected to a height of 55ft., and a third one to a height of 30ft. The whole of the steelwork for the completion of the third leg, and for the gallery girders and arches, is now delivered at Blackpool, and up to the present time over 600 tons of iron and steel has been delivered.

Correspondence.

A.A. "BROWN BOOK."

To the Editor of the BUILDING NEWS.

SIR,—Noting your remarks on the above last week, I think if you look at the reports on the classes, &c., held last session, you will wonder with me where the "encouragement" mentioned by the committee is to be found. To my mind, a more discouraging record would be hard to find. Out of a total membership of some 1,200, the greatest number joining a class in the different divisions is 50, the average under 20!

In fact the A.A. is fast becoming an association of the many for the benefit of the few, very few. The new scheme is only possible for pupils. The architects' assistants, who compose the majority of the membership, are unable to give the time, and not always the money necessary. Besides, they are not so foolish as to give 20s. for what they can get for 10s., even with the inducement of allowing a discount on taking a quantity. In my humble opinion if the A.A. is to be a success, the fees must be reduced to a more democratic basis (they are much too high now, as they were low before), and the classes arranged so that a member who has little time to spare could join one or more without feeling he has dropped on sufferance among a superior order of beings who are undergoing a systematic cram.

Surely, Sir, it is better for members to study a few subjects than do nothing or go elsewhere.—I am, &c.,
AN OLD MEMBER.

COMPETITION AT LLANELLY.

SIR,—Your sensible remarks anent the way this competition has been conducted by the local authorities will be endorsed by every sensible architect. It seems a perfect farce to ask an architect of reputation to arbitrate, and then actually, when his decision is given, set to work to see if it agrees with local notions as to the designs selected being the best!

In this particular instance, as soon as Mr. Barry's decision was given, the competitors were asked to allow their designs to be exhibited in public, the names of the competitors being withheld, and I presume this was done. I can see no reason why, if competition designs are to be exhibited in public, the names of the unsuccessful competitors should be withheld. There is nothing *infra dig.* in being beaten in a fair fight; but it is most discouraging to not feel sure that the decision of the arbitrator will be loyally adhered to by the promoters of a competition.

I, in common with many other architects, refuse to go into any competition without a professional assessor; but I have recently found out to my cost that this is no safeguard to fair dealing, as the assessor's award may be set aside after all, if not in accord with local views.—I am, &c.,
C. E. SAVERY, M.S.A.

LAND SURVEYING.

SIR,—The diagram in my letter in your issue of August 5 was meant to be neither a perfectly new case nor a perfect facsimile of the lower half of Fig. 5. Being led by the clerical error in "Northman's" letter of July 15 to suppose his figures erroneous, I tried to find the relation between the variations of the two check lines by an approximate method. I did this because I did not want to use the calculus, by which alone could the accurate relation have been found.

Thinking that "Northman" wished to argue on general principles rather than on particular cases, I took F half-way between A and B for ease in calculation, the difference from its position in Fig. 5 being small. Now, the relation of variation of the two check lines alters when the error changes, and so, as is general in such cases, I took the error to be zero, or YA and Y_a coincident; this is similar to "proceeding to the limit" or "differentiating" in the complete process. The method was only approximate, as F was not in its right place, and E was considered fixed. Finding from his next letter that "Northman" evidently did not understand this method, I took his exact figures for the basis of my letter in your issue of September 23, to the conclusions expressed in which I still adhere (briefly, that the sacrifice in accuracy, which I fully admitted, was compensated for by ease and quickness of measurement). Having taken his exact figures, surely the approximate method can be left.

With regard to Fig. 4, the misunderstanding has arisen from the fact that while I measured from B to C, "Northman" measured from C to B. The direction of measurement should perhaps have been stated, though a check line, such as E D, has been thought by competent authorities to be sufficient check on a triangle such as A B C. The examples in the article on chaining were given from actual fields, as I thought it would be more interesting to the students; but perhaps it would have been better to have given the stock fields and lines of the textbooks.—I am, &c.,
Gravesend, Oct. 12. G. W. COBHAM.

Intercommunication.

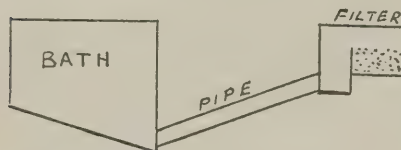
QUESTIONS.

[10869].—**Tennis Courts.**—Will any of your readers kindly explain the best method of laying a gravel tennis court, what the foundations should be, and how it should be drained?—JERSEY.

REPLIES.

[10833].—**Timber and its Position.**—I would suggest that your correspondent, "E. S.," gets a piece of seasoned balk timber, have it split down the centre, and then place each piece vertically in a bowl of water, reaching to about a quarter of their height, one in the natural position in which it grew, and the other the reverse way. Let them stand in a warm room for a time, and then notice which shows signs of moisture on the top first. I would also advise him to read some authorities on timber and its growth: he would then obtain better information on the subject than I can give him through the columns of your interesting paper.—SIDNEY F. HARRIS.

[10852].—**Tidal River Bath.**—I note that above query has not yet been replied to, and on reading it through can understand why. "Tidal Water" has not given sufficient data to work upon. He has omitted to state two necessary factors—viz., the length of pipe from the filter to bath, and the level of bottom of bath with respect to water level at outlet from filter at commencement of the hour. A simple outline sketch would be advisable, as for example, thus—



Will "Tidal Water" kindly supply this information?—N. B. D.

[10857].—**Testing Drains.**—"C. E. H.," on p. 512, approves of the use of ether, and considers it better than peppermint. Both the ether and peppermint tests, however, appeal only to the sense of smell, and many people are very deficient in that sense. Further, these mere smell tests are very indefinite, and with them it is often difficult to localise, and to judge of the extent or character of the leakage. The smoke-test, again, applied with a proper machine and with sulphur mixed with the cotton waste, appeals to both the senses of smell and sight, and often shows at once where the fault is. This is very useful where the fault is small, and prevents reckless and unfair condemnation of fittings. Where the fittings are really bad, then the smoke filling the premises gives ocular demonstration which it is difficult to get over. The ether and peppermint tests are too indefinite, in my opinion, for a court of law: with them fittings have been condemned in a mass, while all that was wrong was a small accidental perforation of the soilpipe with the point of a nail, which, when discovered, was rectified in a few minutes with a drop of solder.—W. P. BUCHAN.

[10864].—**Measuring Fees.**—The builder is supposed to pay half the fees for measuring up extras, unless otherwise agreed.—H. H.

[10865].—**Ornament.**—"Student" could not do better than attend the classes on Applied Art at the London University. The first necessary is to select good ornament, and for this purpose the Architectural Museum, Westminster, King's College Museum, and especially the South Kensington Museum should afford excellent examples for drawing and study in "Student's" leisure hours. For books, Owen Jones's "Grammar of Ornament" and the works of Wornum and Ruskin are recommended; but I should advise "Student" first to go through a course of lectures and to study Ward's "Principles of Ornament" for the elementary principles. Ornament should be taught by a proper method. Copying ornament from books and buildings promiscuously, and trying to design it, before acquiring a general knowledge of art, is unsatisfactory and misleading. A study of nature, especially plant form, is absolutely essential.—G. H. G.

[10866].—**Conductor for Lightning.**—Providing the earth is moist, a conductor should (after having been brought out from the line of the building about 20ft.), where practicable, be taken to a depth of from 5ft. to 6ft., and the end should be riveted to a copper plate (being in proportion to the size of the conductor employed). It is desirable to surround the wire and the plate with coke (from two to three bushels), as it tends to prevent the copper from very rapid corrosion in a moist situation, and at the same time provides a large conducting mass. The above suggestions are in accordance with some of the greatest acknowledged authorities on lightning conductors. It is, however, impossible to lay down

for "Architectus" any very definite rule without knowing the particulars of the situation of the proposed conductor, which might be influenced by any of the immediate surroundings, such as adjacent water or gas mains, in either of which cases the conductor should be attached.—C. E. H. A. and S.

[10868].—**Conductor for Lightning.**—According to one authority, the conductors should terminate in earths, offering each about 18sq.ft. of external surface: these may consist of copper plates about 3ft. square, riveted to the conductor's ends, and buried in the wet soil from 15 to 25ft. from the building. When the water-level is deep, special wells should be sunk for the earth plates, and these wells ought to be carried down several feet below the water-level in the driest seasons, and the lower portion of well should be built dry. The above are quoted from Rules for Buildings where the manufacture of explosives is carried on, and are issued by the War Department, so they are perhaps unnecessary for ordinary buildings. Each rod should be connected to earth by the shortest path outside the building, and if practicable it is well to carry the conductor down that face which is most exposed to prevailing wet. "Architectus" may consult Anderson's work or the new work on Lightning Conductors by Oliver D. Lodge, D.Sc., LL.D., &c., published by Whittaker and Co.—B. FRANKLIN.

[10867].—**Sliding or Lifting Shutters.**—I have seen good examples of both. The lifting shutter casing is rather draughty, but really forms a good fresh-air inlet sometimes. It is hung in precisely the same way as sliding sashes in front of the sash frame, and is really a boxed frame or casing in which the two shutters slide side by side or one in front of the other. A flap shuts down over the casing when the lifting shutters are not in use. The upper rails of both when down are level with the window sill. A framed back is placed in front of the casing. The upper shutter is nearest the back, and the other inside between the parting bead and a bead fixed on to the inside lining of sash frame. Sliding shutters which slide laterally have recesses or boxes on each side, the disadvantage of which is they occupy a large space on each side of the window, which cannot be always obtained. I prefer the lifting shutter for a country house. The casing or boxing has usually to be sunk below the floor level, and there should be a cement or non-porous material for the outside and bottom of casing.—G. H. G.

CHIPS.

At the monthly meeting of the local board of Warminster, held on Monday, £50 was granted to the surveyor (Mr. Long) on account of extra services rendered by him in connection with the installation of the new engine, &c., at the Waterworks. It was reported that the actual cost of the new works would be £1,520, as against £1,550, the loan sanctioned for that purpose.

The Right Rev. Bishop Smith, Bishop of Dunkeld, laid on Monday the foundation stone of the new Convent of Our Lady of Mercy, which is to be erected at Lawside, near Dundee.

Alterations have been made to the union workhouse at Lincoln, embracing the ventilation, which is now carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

At Tuesday's meeting of the Middlesbrough County Council, a long discussion arose on an amendment moved that a minute, requesting Mr. C. H. Howell, architect, of London, to come to Middlesbrough to meet a sub-committee on the subject of accepting a commission for the erection of the proposed asylum, be not confirmed. Eventually the minute was confirmed, and it was further decided to submit a number of sites to Mr. Howell to report upon.

The Bristol Town Council decided on Tuesday, by a majority of 42 to 2, to promote a Parliamentary Bill to carry out the dock extension scheme at Avonmouth and Bristol. A resolution pledging the council to the Corn-street and Broad-street site for municipal buildings was rescinded, and a special committee was appointed to consider and report as to the relative area, cost, and advantages of other sites available. By a casting vote it was resolved to spend £1,200 on improving the accommodation of the Bristol Council-house; but notice to rescind this was given.

A coffee tavern has just been built in Phoenix-street, Lancaster, from plans by Mr. E. Howard Dawson, A.R.I.B.A., F.S.I. The work has been carried out by local tradespeople at a total cost of £2,000.

At the meeting of the Kettering Board of Guardians on Monday, Mr. J. A. Gotch, F.S.A., presented plans for additions to the workhouse, including a new infirmary, and he was instructed to prepare alternative plans to include a new board-room.

The proposed memorial in Winchester Cathedral to the late Bishop Harold Browne is to be a recumbent effigy of the deceased Prelate, and a committee has been formed to collect the necessary subscriptions.

Memorial stones of the new free library and public baths and wash-houses for Westminister were laid on Wednesday week. Mr. F. J. Smith, of Great George-street, S.W., is the architect, and Messrs. Lough, Simpson, and Co., of Brompton-road, are the builders.

Legal.

THE PRIVATE STREET WORKS ACT, 1892.

CASES are constantly arising over disputed points as to the paving, &c., of new streets and the liabilities of owners of frontages under the Public Health Acts. So complex is the subject that a book dealing with it separately and, as far as possible, exhaustively has come to be required. In "The Law and Practice of Paving and Making Good Private Streets," by Mr. William Spinks, A.M.I.C.E., &c. (Spens, 125, Strand), we have such a work. In his third edition, just issued, the author has added as an appendix the very important Private Street Works Act, 1892, of last session. This statute, which is to be read with the Public Health Acts, can now be adopted by any urban sanitary authority after certain formalities, and when adopted it will supersede those well-known sections, 150-152, of the Public Health Act, 1875, upon which they have hitherto had to depend. In the same way the Local Government Board may extend the new Act to rural districts. Mr. Spinks has clearly taken great care to bring his book down to date, and to note up all decided cases. He has also given some notes upon the new Act, which has in law been in operation since the date of its passing, on 25th June last; though, of course, it has not yet had time to be generally and practically adopted. Seeing that this adoption conveys many and various advantages as compared with the sections of the Public Health Act, 1875, it is pretty sure of a welcome by most of our urban sanitary authorities; and, therefore, its provisions will become of very general and pressing interest to all concerned in building operations.

The new Act provides for a provisional apportionment of the estimated expenses among the premises liable to be charged, so that objections can be taken by parties interested before the work is begun, instead of after it was completed, as under the older plan. The statute opens a very wide question when it declares in section 10 that the urban sanitary authority may consider in its apportionment of the expenses the greater or less degree of benefit to be derived by any premises from such works, and may also take into account the amount and value of any work already done by the owners or occupiers. This clause will afford a means of equitably adjusting the apportionment, without being bound by the iron rule of frontages. Powers are also given for including necessary incidental works in the estimates for paving, &c., and for charging a 5 per cent. commission for surveys and superintendence. Another important section is that under which an urban authority may, if it thinks fit, contribute the whole or portion of the expenses of any private street works, and pay the same out of the general district rate. Section 19, which gives power to the urban authority to adopt a private street which has been properly paved, &c., as a public highway, is also likely to be extremely useful. In short, there is a good deal in this new statute well worthy of careful attention.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

A SUFFERER.—DRAINS.—WARRANTY.—This question really turns on matters of fact and evidence. If you can prove the landlord's express warranty as to the drains and the sanitary condition of the house as stated, you would have a good ground of action, and you should sue him for damages for breach of his express warranty as to the state of the drains, and upon his false representation as to its sanitary condition. You should at once consult your solicitor.

ARCHITECT.—REMUNERATION.—The usual rule is that if the intended building is abandoned after the completion of working plans and specifications, the architect should get 2½ per cent. commission, and that if it has gone as far as delivery of tenders he should have 3 per cent. But this is of course subject to any bargain that may have been made.

The judges at the International Exhibition which has just closed at Douglas, Isle of Man, have awarded the gold medal of honour as well as a diploma for excellence of work as exhibited in sculptured alabaster and carved oak to Mr. Harry Hems, of Exeter.

LEGAL INTELLIGENCE.

GARDENS AS ENCROACHMENTS ON STREETS.—At the Manchester county police court on Saturday Mr. Oliver Heggs, builder and contractor, Levenshulme, was charged with infringing the Public Health Act. The offence alleged was that in contravention of the by-laws of the Levenshulme local board, the defendant omitted to make two streets which he had laid out in Levenshulme—Carrillgrove and Worsley-grove—36ft. wide. Evidence was given to the effect that when defendant originally submitted his plans to the board's surveyor the distance from house to house in these streets was 36ft., but it was indicated that gardens were to be made on this scheme in front of the houses. The plans were rejected. Subsequently they were resubmitted without the provision for gardens, and the board approved them. After the houses were built the defendant, however, caused gardens to be made, which reduced the width of one street to 15ft. 6in., and of the other to 18ft.—In cross-examination the board's surveyor admitted that many streets in Levenshulme made since the by-laws were framed had gardens in front which reduced their width to much less than 36ft., one of these belonging to a member of the local board. While admitting the offence, defendant's solicitor urged palliation on account of both streets being *cul de sac*. He contended that the houses were more cheerful and picturesque on account of the gardens, and that no injury was occasioned to anyone. The case was adjourned for a month to see if some compromise could be arranged.

HALF COSTS OF WALL TO BE PAID WHEN UTILISED.—At the Brompton County Court on Wednesday week, before the deputy judge, Mr. Cooper Wyld, Henry Fowler, builder, of 47, Davisville-road, Shepherd's Bush, sued Robert Julian, also a builder, living at Ashchurch-grove, for £25 for trespass. The plaintiff deposed that in 1880 he erected four houses in the Davisville-road, and the property was inclosed by a wall. Some time after the defendant put up houses on land which adjoined, and plaintiff then asked him to pay half the cost of the wall, £25. Defendant offered £15, and plaintiff refused. Plaintiff communicated with the defendant again, and he was then told that Mr. Julian did not intend to pay anything. Defendant: I offered him the £15, I know, and then a gentleman who had bought one of Mr. Fowler's houses said it was his wall, and I ought to pay him. I wrote to my solicitor, and he advised me to repudiate the liability. Mr. Stevens, the district surveyor, said the defendant was responsible to the extent of £23. Judgment for the plaintiff for £23, and costs.

DAMAGE AGAINST A BUILDER.—At the Southwark County Court on Monday, before Judge Holroyd and a jury, Mrs. Sellwain, the wife of a carman, of Darwin's-buildings, Old Kent-road, sought to recover £30 from Mr. Amos Eaton, a builder, of 5, High-street, Whitechapel, as damages for personal injuries sustained by her through the negligence of his servants. Some bricks fell from a building in course of erection by defendant in Middlesex-street upon plaintiff, injuring her shoulders and back. The jury awarded £25 damages, and costs were allowed.

ARCHITECTS NOT PERSONALLY LIABLE.—*Constantine v. Brown.*—At the City of London Court, on the 5th inst., T. J. Constantine, of 61, Fleet-street, claimed £215s. 6d. of the defendant, Edward Brown, architect and surveyor, of 5, Elder-street, Spitalfields, for cleaning out an old range and putting in a new one. The defendant said he gave the plaintiff the order in his capacity as architect for the owner, a Mr. Proctor. He had given the plaintiff many previous orders, and they always looked to his (defendant's) clients. He was not personally responsible. Mr. Commissioner Kerr: An architect does not make himself personally responsible. You must sue Proctor. Judgment for the defendant, with costs.

ARBITRATION AT EDINBURGH.—The proceedings in the arbitration between the Corporation of Edinburgh and the North British Railway Company as to the price to be paid by the latter for the ground taken by them in Princes-street Gardens, have been closed so far as the taking of evidence is concerned. The oversman in the reference is Lord Shand; Mr. Dunlop, Westminster, is the arbiter for the corporation; and Mr. James Davidson, Saughton Mains, acts as arbiter for the railway company. The witnesses heard on the later days, since our report of last week, p. 513, included Hamilton Beattie, architect, Edinburgh; B. Hall Blyth, C.E., Edinburgh; James Barr, C.E., Glasgow; Wm. Ormiston, ordained surveyor, Edinburgh; Haldane Beattie, builder, Edinburgh; H. E. Milner, landscape gardener, Westminster; Wm. Thomson, Cravenfords; and David Low, horticultural builder, Edinburgh. The arbiters, Messrs. Dunlop and Davidson, held a private meeting on Tuesday in Dowell's Rooms, Edinburgh, with the object of adjusting their decision. After consideration of the case extending over three hours, they were unable to agree as to their valuation, and the matter will accordingly be referred to Lord Shand, the oversman.

WATER SUPPLY AND SANITARY MATTERS.

NORTHAMPTON.—At a town council meeting held at the Guildhall on the 3rd inst. it was resolved, by a majority of 17 votes to 6, to adopt Mr. Bailey Denton's report to increase the area of the Sewage Farm by the purchase of 200 more acres of land, and to purify the sewage of the town by means of wide irrigation and intermittent filtration, and not to have recourse to the "international" system of sewage purification by means of ferrozone and polarite beds.

CHIPS.

The marriage of Mr. Ralph Nevill, F.S.A., of Rolls-chambers, W.C., to Mary Beatrice, daughter of George T. Tweed, of Honiton, took place on Wednesday at St. Barnabas, Kensington.

The health of M. Paul Dubois, Director of the School of Fine Arts, Paris, who has been ill for some time past, underwent a sudden change for the worse on Tuesday evening. His condition causes great anxiety.

The memorial-stone of the institute in connection with the Canal Boatmen's Friendly Society of Scotland, which is at present being erected at Port-Dundas, Glasgow, was laid on Tuesday. The premises are being constructed at the corner of Port-Dundas-road and Dobbie's Loan. There will be a coffee-room and library, rooms for committee, and a hall capable of seating 250. There are also on the basement floor a recreation hall and drying-room, and also a kitchen and lavatories. Messrs. John Honeyman and Keppie, Glasgow, are the architects. The cost of the ground, building, and furnishings will be £5,000.

Mr. Arnold Taylor, Local Government Board Inspector, held an inquiry at the Rochdale Town Hall, on Thursday, as to an application by the Rochdale Corporation to borrow £65,000 for gasworks purposes (the provisional order having been already granted), and £12,000 for street widening and improvement.

A new peal of bells hung in the tower of Machynlleth parish church as a memorial were consecrated on Friday. The tower originally contained three bells, which were cast in 1745, but two of them had been cracked for some time past. The work of casting the bells was intrusted to Mr. Barwell, of Birmingham.

The decorations of St. Saviour's church, Falkner-square, Liverpool, have been completed under the superintendence of Mr. Charles Aldridge, F.R.I.B.A. In the dome of the chancel where the decorations have culminated, are seven circular panels representing the Four Evangelists, also St. Peter and St. Paul. In the centre of these is a stained-glass panel of the Saviour. These have been painted by Mr. Lonsdale. The alterations have been carried out by Messrs. Shrigley and Hunt, of Lancaster.

Two houses in Cumberland-walk, Tunbridge Wells, have just been remodelled to form a vicarage for King Charles's Church. Mr. Ladds was the honorary architect, and Messrs. C. S. Strange and Sons were the contractors.

M. E. Signol, a well-known French painter of sacred subjects, has died at an advanced age. A pupil of Blondel and Baron Gros, he obtained the Prix de Rome sixty-two years back. Between 1838 and 1844 he did much work for the embellishment of the galleries at Versailles. His "*Femme Adultère*," now in the Luxembourg, was the most popular picture of the Salon of 1840. In that year he was employed in decorating the Madeleine, and he subsequently worked in other Parisian churches. To the Universal Exhibition of 1855 he contributed largely.

About fifty members of the Architectural Association visited St. Alban's Cathedral on Saturday week, and were conducted over the building by Mr. James Neale, F.S.A.

A bust of the late Miss Constance Naden, daughter of a Birmingham architect, and mounted on a black marble pedestal, has been placed in the Mason College at Birmingham. Mr. William Tyler, of London, was the sculptor.

A new organ, built by Messrs. Young, of Manchester, at a cost of about £300, has been placed in the Rishworth Baptist Chapel.

The memorial-stone of the new markets for Halifax was laid on Friday. The work is being carried out from plans by Messrs. Leeming and Leeming, of London and Halifax, selected in competition. Mr. Charnock is the contractor. The mayor, when laying the stone, mentioned that the land had cost £44,106, the contract for the erection of the arcades leading from Russell-street was let for £12,548 16s. 10d., that for the general market for £4,045 6s. 2d., whilst architects' commission and other extras would amount to £4,329, giving a total for the buildings of £60,923, or about £20,000 in excess of the original estimates.

Our Office Table.

THE change of venue of the annual conversation of the Architectural Association from Westminster Town Hall to Mr. T. E. Collcutt's recently-completed Imperial Institute at Kensington proved a great attraction, and the number of members and their lady friends welcomed to the Institute by Mr. H. O. Cresswell, as president, and the committee, on Friday evening, was nearly double that of recent years. For such a gathering the Institute is not an ideal building, although adapted for its normal purpose. The lack of a general assembly hall as a rendezvous for acquaintances is a great drawback. The staircase is not monumental in scale, and too much space is taken up by the wide corridors. Truth to tell, beyond the arrangement of the building itself, there was little to interest the crowd of visitors. Mr. J. L. Robinson's photographs of the recent Taunton excursion were on view in the temporary committee room at the further end of the highest floor, and on the first floor the eastern wing was occupied by the exhibition of Indian art metal work, soon, it is understood, to be dispersed. The western wing of the building is given over to a trade display of Oriental fabrics, where the plentifully distributed cards of the various firms, and the placards "All these goods are for sale," clash with one's conception of what should have been the outcome of all the touting and squeezing for funds for a national memorial of her Majesty's Jubilee, and are unworthy of the *prestige* even of a nation of shopkeepers. At present the Imperial Institute only represents India, none of the Colonies showing any exhibits. In the comparatively small end room of the western corridor on the first floor entertainments were given at intervals during the evening by Dan Godfrey's orchestral band, and also by the body of artistes calling themselves the Spanish serenaders, who gave some excellent songs and instrumental selections.

MANY who have little sympathy with hero and relic worship will, nevertheless, feel satisfaction in the assurance just given that Nelson's old flagship, the *Foudroyant*, will be brought back to this country and permanently moored in the Thames as a specimen of our hearts-of-oak navy and as a Nelson museum. A guarantors' committee has procured the ship for £5,000, and it is intended to offer her to the nation as a gift, refitted with masts and riggings of the type used a century since. The Teutonic successors to Daniel Quilp have already removed her upper deck, but the rescuers of the old tub assert that they will have no difficulty in securing and replacing the original timbers, and even though the vessel ought to be labelled "Made in Germany," it will be a picturesque and interesting object on the Thames.

THE new School of Applied Art in Edinburgh will be opened on Friday in next week. The school is started under favourable auspices. The Board of Manufactures for Scotland has granted rent free two of the largest rooms in the Royal Institution as a school-room and lecture-hall; the City Council of Edinburgh has voted a grant of £1,000, and other subscriptions to the extent of nearly £1,500 have been raised chiefly by professional men and craftsmen in the city. The school is established, according to the prospectus, for the purpose of "imparting to architects, decorators, sculptors, wood-carvers, metal-workers, silversmiths, plasterers, bookbinders, printers, glass-painters, &c., a knowledge of art design as applied to industries." This winter, in commencing operations, it is intended that the basis of the teaching shall be an education in common in Classic, in Renaissance, and Mediaeval arts. The education in the new school will begin practically where the instruction given in the local Board of Manufactures School of Art leaves off; and will embrace for its leading feature continuous instruction in art styles from the Classic period until now. Dr. Rowand Anderson, who, with Mr. Inglis, has selected the nucleus of a collection of casts, will act as director of the classes, assisted by Mr. Frank Simon and Mr. John Watson as draughtsmen, and Mr. Robert Innes as modelling assistant. The library of the Edinburgh Architectural Association has been removed to the new school, and will, with the art library formed by the Board of Manufactures, be available free for consultation.

At the close of the paper read by Mr. Okoshi

at the opening meeting of the Japan Society on Wednesday evening, at the Society of Arts, Sir Edward Reed in the chair, on "The Proverbs and Popular Sayings of the Japanese People," a demonstration was given of a series of wall-pictures, bronzes, carvings in ivory and wood, objects in lacquer, and ancient New Year's cards and wood-block colour prints of Japan, in which the wisdom, wit, and quaint humour of the Japanese are artistically rendered. The proverbs were illustrated from some hundreds of art objects belonging to the historic art of Japan, selected from the collection of Mr. Ernest Hart, and a series of proverb cards used as a game among the young people of Japan. The wall was hung also with brilliant but delicately-coloured portraits by Moronobu, Yeishi, Toyokuni, and other leading painters of Old Japan, of celebrated and dangerous beauties arrayed in all the colours of the rainbow. These pictures were painted in the 17th, 18th, and 19th centuries.

THE agitation against the Registration of Architects Bill by the Builders' Association of Victoria has some meaning to those who can read between the lines. The Bill itself, as we have before said, has been warmly espoused by all the independent architects of the colony; it has been redrafted into a form that has disarmed all opponents; but all at once the contractors have displayed hostility to the Bill. Is there not a selfish motive underlying this opposition? The competing contractor of a certain class would naturally oppose any attempt to make architects more efficient and competent; they would also look with dismay on any measure which would protect the public against the employment of any but skilled architects. We cannot believe that such a motive has prompted the higher class of contractors of Victoria, but only those who, as our contemporary the *Australasian Builder* puts it, thinks that a "builder is as good as an architect," and should be allowed to take architects' work.

THE Plumbers' Company are to be congratulated upon sharing, to the extent of £20,000, in the bounty of the late Mr. Robert Berridge, of Cambridge, who has left upwards of £150,000 for furthering the spread of sound views and practice in sanitary matters. Only the interest of this sum will be used, and that use is by the terms of the bequest to be confined to Great Britain. By this legacy the Plumbers' Company will be able to extend their scheme for the improvement of the plumbing trade by the establishment of additional district councils and technical classes. Under the same legacy £10,000 has been allowed to the Sanitary Institute, £4,000 to the Society of Medical Officers of Health, £3,500 to the Association of Public Sanitary Inspectors, and £10,000 each to the chairs of hygiene to be founded by University and King's Colleges, London.

MR. ARTHUR HILL, B.E., F.R.I.B.A., presided at the last meeting of the Munster District Council for the National Registration of Plumbers, held at Cork a few days since. A letter was read from the Worshipful Company of Plumbers, London, stating that Mr. W. Kaye Parry (architect), of Dublin, was at present engaged in preparing some slides to illustrate his forthcoming lecture on "Domestic Sanitation" at Cork, and that the same would be ready in about a couple of months. A lengthy discussion took place in connection with the opening and working for the session of the plumbers' workshop, now fitted up at the School of Art, and the classes connected therewith, and it was decided that the sub-committee previously appointed be empowered to draw up a syllabus of instruction in two grades for the pupils attending the class, and to make such arrangements in reference to the teaching of the different branches of the work required as they may consider necessary.

The town council of Manchester have accepted a tender for £46,410 for the erection of labourers' dwellings in Oldham-road.

Mr. J. Brooke, of Crawe, has been appointed surveyor to the local board of Northwich, at a salary of £190 a year. There were 81 candidates.

The laying of the memorial stone of the Church House, in Salop-road, Welshpool, right opposite the parish church of St. Mary, by the Countess of Powis, took place on Thursday in last week. The architect is Mr. T. E. Pryce, Gray's Inn, London; and the contractor Mr. William Roberts, Welshpool. The amount of the building contract was £1,200.

DEATH.
VERITY.—On the 12th inst., at Meadowside, Hutton, near Liverpool, William Verity, Architect. Aged 32 years. R.I.P.

The Architectural Association, 9, Conduit Street, W.; and 56, Great Marlborough Street, W.

THE ARCHITECTURAL ASSOCIATION COURSES OF LECTURES, CLASSES, and STUDIO INSTRUCTION are now commencing. The Courses are both Elementary and Advanced, and are designed to provide a sound professional education, supplementary to that to be obtained by the prevailing system of pupillage. The Course, which is in four divisions, is progressive and consecutive, and the instruction is given by Lecturers and Instructors of known ability.

DIVISION I.
LECTURES and CLASSES.—The Orders of Greek and Roman Architecture, Building Materials, Perspective, Physics.

THE STUDIO.—Drawing from Ancient Examples, Freehand Drawing, Drawings of Examples of Elementary Construction, Plane Geometry, Criticism Meetings.

DIVISION II.
LECTURES and CLASSES.—English Architecture, Materials, Elementary Ornament and Colour Decoration, Strength of Materials, Stresses and Strains.

THE STUDIO.—Designs based upon Ancient Examples, Freehand Drawing, Drawings of Examples of Elementary Construction, Solid Geometry, Criticism Meetings.

DIVISION III.
LECTURES and CLASSES.—The History of Architecture, Materials, Colour Decoration, Sanitary Science as applied to Drainage and Water Supply.

THE STUDIO.—The Design and Construction of Modern Buildings, Freehand Drawing from Casts, Perspective and Sciography, Constructive Masonry, Criticism Meetings.

DIVISION IV.
LECTURES and CLASSES.—The History of Architecture; Sanitary Science—including Ventilation, Lighting and Heating, Painting, Sculpture; other Arts allied to Architecture; Professional Practice—including Legislative Enactments relating to Building Contracts.

THE STUDIO.—The Design and Construction of Modern Buildings, Freehand Drawing from Casts, Drawings of Ancient Buildings from actual measurement, Graphic Statics and Perspective, Criticism Meetings.

EXTRA SUBJECTS.
LECTURES and CLASSES.—Plane and Solid Geometry, Geology, Mensuration, Land Surveying and Levelling, Chemistry of Building Materials, Quantity Surveying—including the Preparation of Estimates, Discussion Section.

THE STUDIO.—Sketching and Measuring, Elementary Water Colour Class, Water Colour Class, Modelling.

A Pamphlet, containing full particulars of the curriculum, may be obtained free on application to the Hon. Secs., at 56, Great Marlborough-street, London, W. Fees must be paid in advance, and passes may be obtained at the Offices of the Association, between Ten a.m. and Seven p.m.

October 21st, the ANNUAL GENERAL MEETING of the Association will be held at 9, Conduit-street, W., at 7.30 p.m., when the award of prizes for the past session will be announced, and the President will deliver his address. The prize drawings for last session will be on view.

ERNEST S. GALE,
F. T. W. GOLDSMITH, } Hon. Secs.

Trade News.

WAGES MOVEMENTS.

COLNE, LANCS.—Messrs. Hawley, builders and contractors, of Colne, who have an extensive building in the town, have given notice to the masons in their employ that their wages will in future be reduced from 9d. to 8½d. an hour.

HIGH WYCOMBE.—A meeting of carpenters and joiners was held at the Swan Inn on Saturday evening last, when, after hearing an address from Mr. Charles Matkin, it was decided to organise a branch of the General Union of Operative Carpenters and Joiners in the town.

ROCHDALE.—Over 1,100 quarrymen came out on strike on Friday in the Whitworth Valley, leading from Rochdale to Bacup. It appears that eight quarry-masters, in the neighbourhood of Millgate, Shawforth, and Freith, have given notice to their workmen of a reduction of wages, and the notices expired on Monday, the 11th inst. A large number of quarrymen who are on strike in the Slacksteads district went over into the Whitworth Valley on Friday, and persuaded the quarrymen there to come out.

CHIPS.

The first sod of sewerage works for Chepstow was cut on Friday. Mr. C. Walker is the engineer, and the contract has been taken by Mr. Whalley for £3,500.

The peal of ten bells in the central tower of Hereford Cathedral have just been restored, having been rehung and refitted by Messrs. Blackburn and Greenleaf, of Salisbury. The treble bell has been recast.

The Stockport town council have adopted the sewerage scheme for the borough prepared by Mr. A. M. Fowler, C.E., the cost of which, it is estimated, will be £80,000.

Of the sixty-four oaken statuettes required to fill the tabernacle work of the choir-stalls and bishop's throne in Lincoln Minster, all but sixteen have been given or promised, and will very soon be in their places.

Mr. J. Burns, M.P., announced at a meeting held in Battersea on Monday night that if the local vestry and the County Council would raise £10,000 towards the sum required for the purchase of the Albert Palace, an equal sum would be given by a person whose name he was not at liberty to disclose.

Holloway's Pills purify the blood, correct the bile, give tone to the stomach, excite a healthy appetite, produce sound sleep, and impart increased energy to both mind and body. The admirable properties of these far-famed Pills are too highly appreciated to require any encomium here, as they are resorted to by rich and poor of every nation.

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TENDERS.

* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender; it adds to the value of the information.

ASHFORD, KENT.—For the making of a new road to be called the Victoria-road, on the Beaver Estate, Ashford, to form an entrance to the bacon factory. Mr. Henry J. J. Jeffery, M.S.A., Ashford, architect and surveyor:—
Knock, H., Ashford (accepted) ... £350 0 0

AVIEMORE, N.B.—For the construction of the last section of the through line from Inverness to Aviemore, for the directors of the Highland Railway:—
Maekay, J. (accepted) ... £117,925 0 0

BELFAST.—For Belfast main drainage. Contract No. 7:—

Brebnar, R. C., Edinburgh	£41,106 0 0
Dixon and Campbell, Belfast	39,950 0 0
Workman and Co., Belfast	30,500 0 0
Perkins, J., Manchester	30,261 0 0
Henry, J., Belfast	29,882 0 0
Martin, H. & J., Limited, Belfast	29,047 0 0

* Accepted.

BURSLAM.—For alterations and additions to the Staff of Life Hotel, Burslem, for Mr. Charles Pemberton. Mr. J. Blood, 2, Queen-street, Newcastle-under-Lyne, architect and surveyor:—

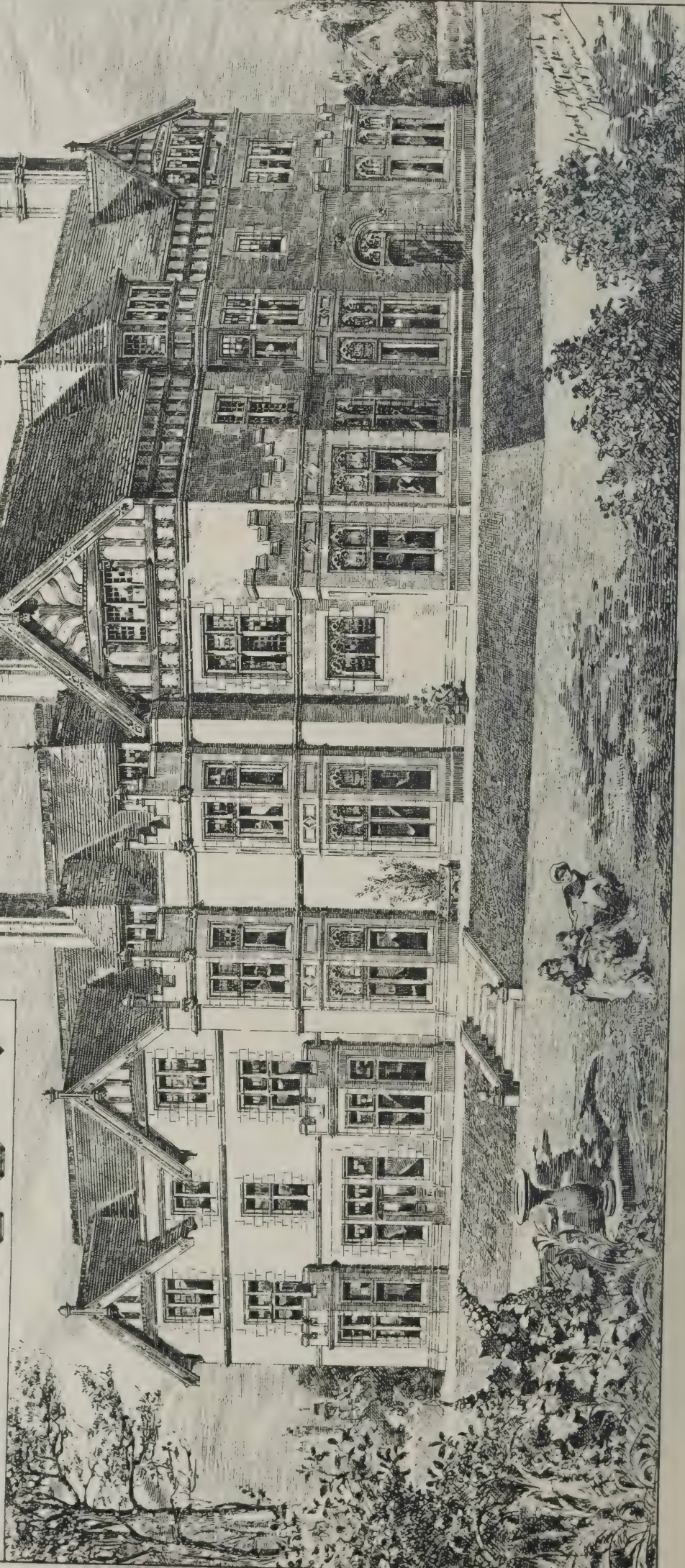
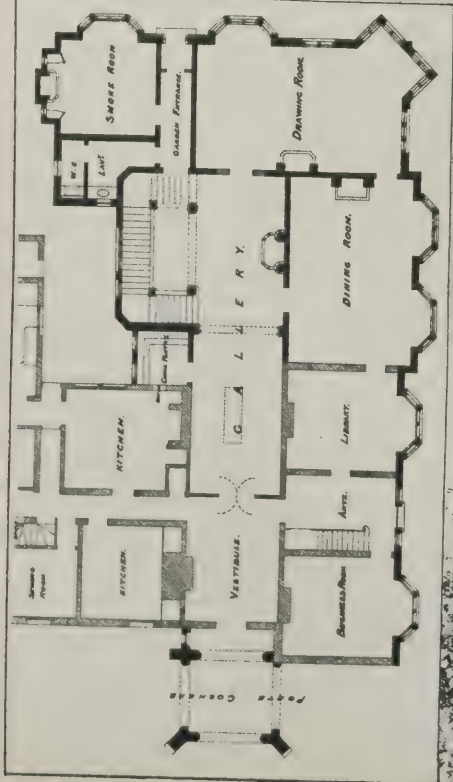
Longden, J. J., Burslem	£855 0 0
Cooke, W.	812 0 0
Gallimore, J., Newcastle, Staff	725 0 0
Bradbury, Stoke-on-Trent	723 0 0
Shenton, W., Burslem	720 0 0
Bennett, N., Burslem (accepted)	710 0 0

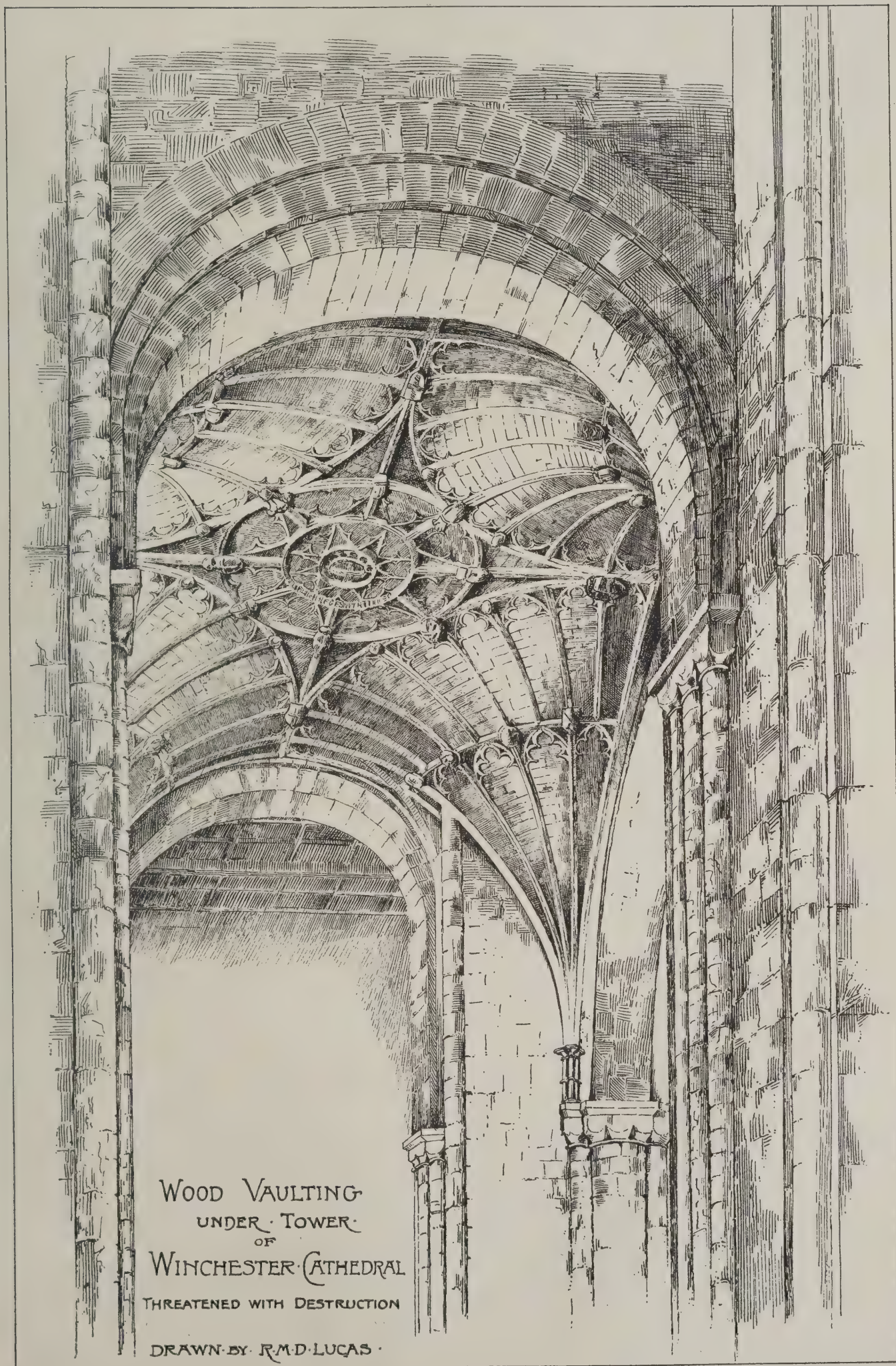
BRISTOL.—For alterations and sanitary and decorative works at the Clifton Down Hotel. Mr. Herbert J. Jones, M.S.A., Bristol, architect:—

Wilkins, R., and Sons	£2,047 0 0
Gay, E.	2,038 0 0
Humphreys, G.	1,967 0 0
Wilkins, G. H.	1,914 0 0
Cowlin, W., and Son (accepted)	1,872 0 0

All of Bristol.

HASELEY HALL, WARWICKSHIRE.

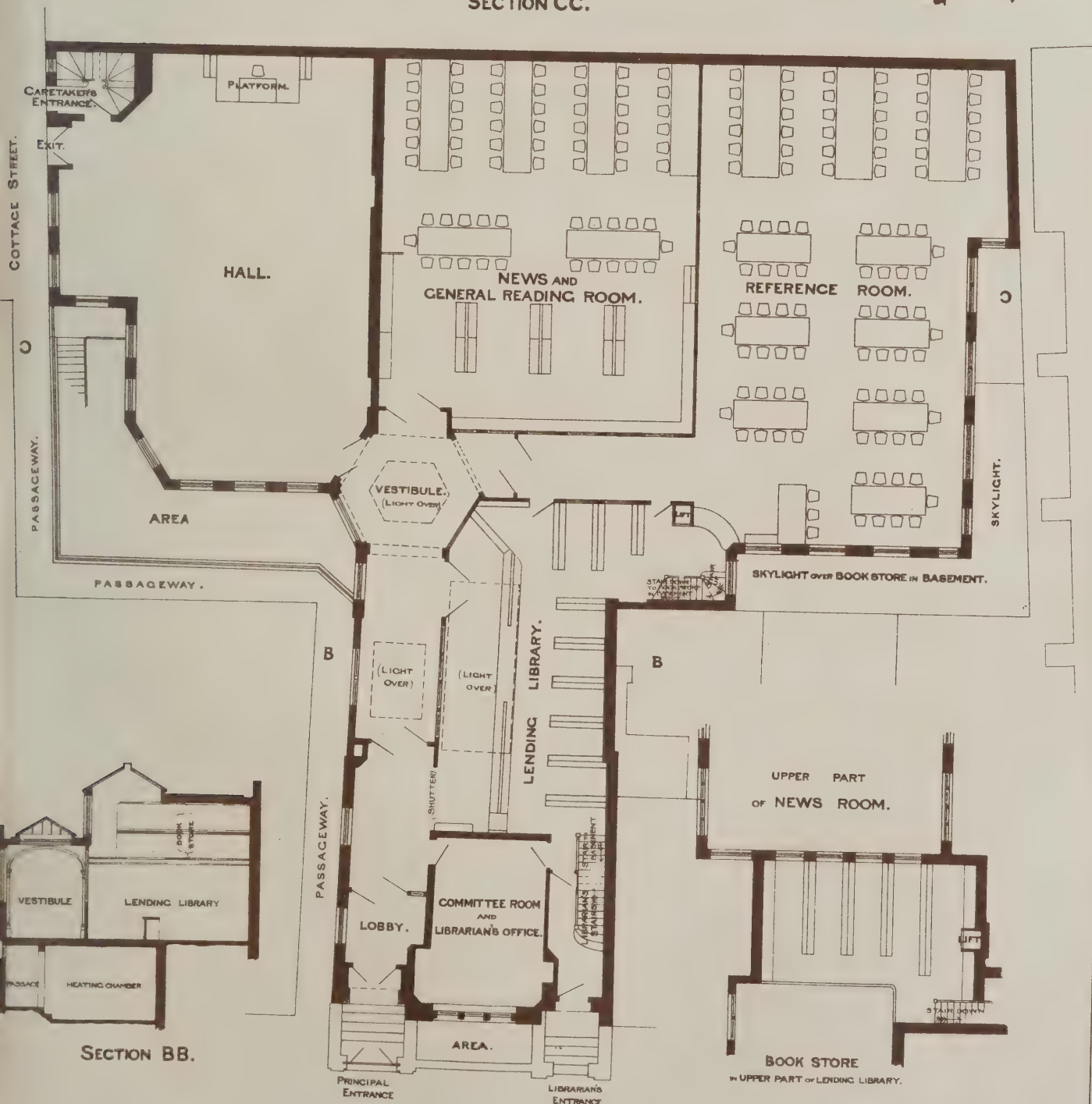








SECTION CC.

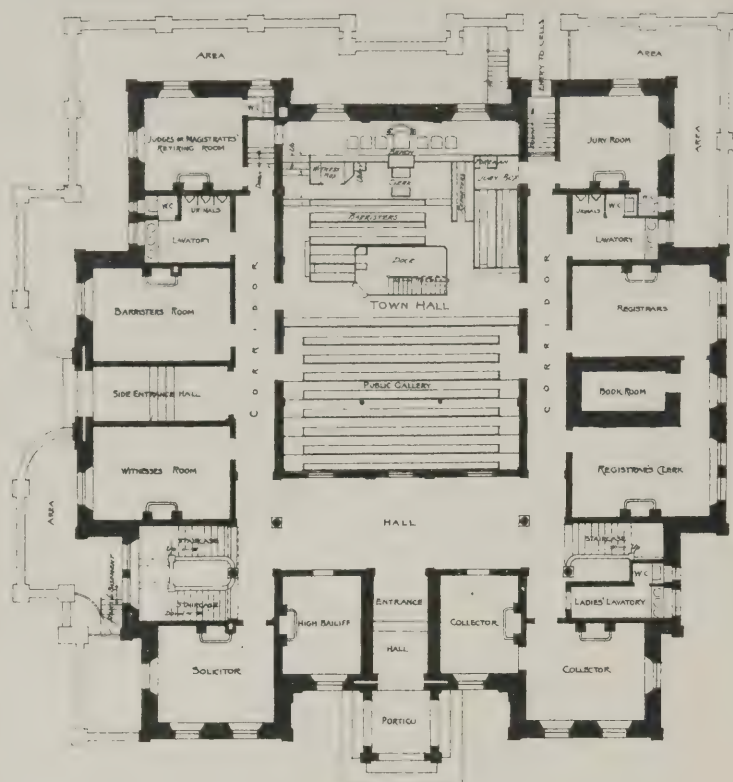


GROUND PLAN.

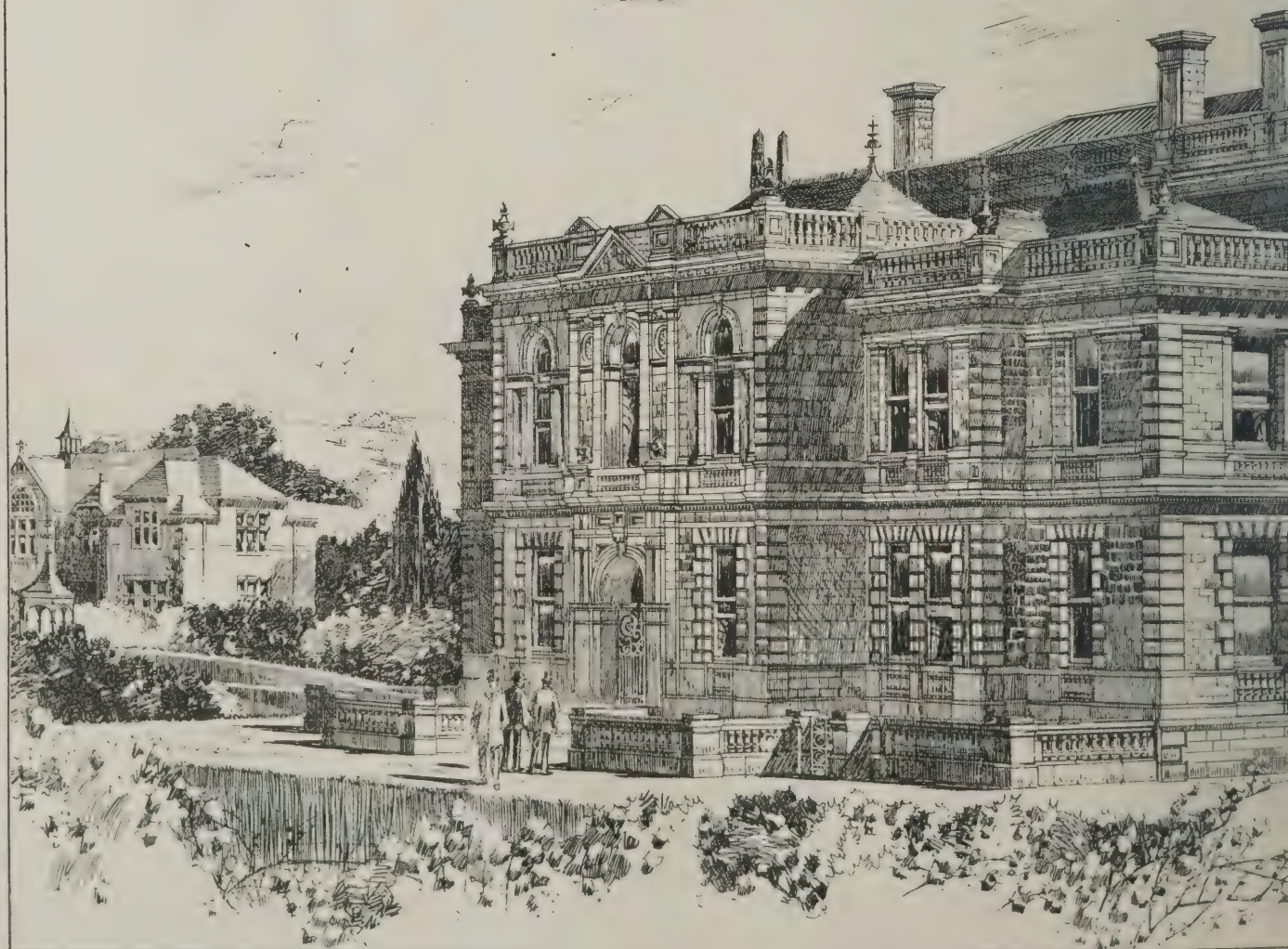
SELECTED DESIGN.

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J AND S.F. CLARKSON ARCHITECTS.



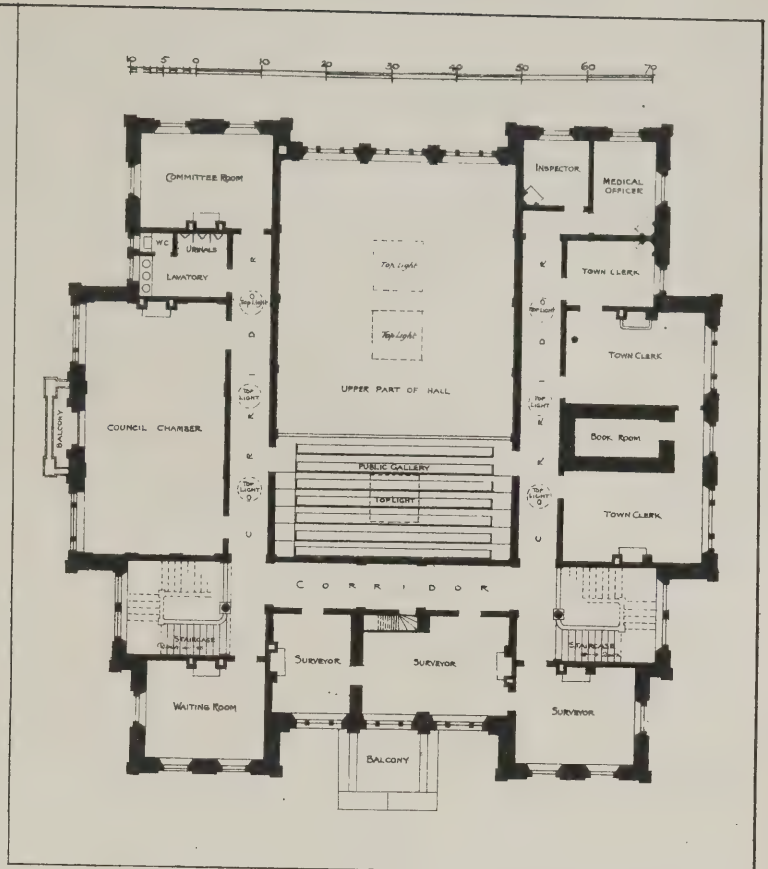
GROUND FLOOR PLAN



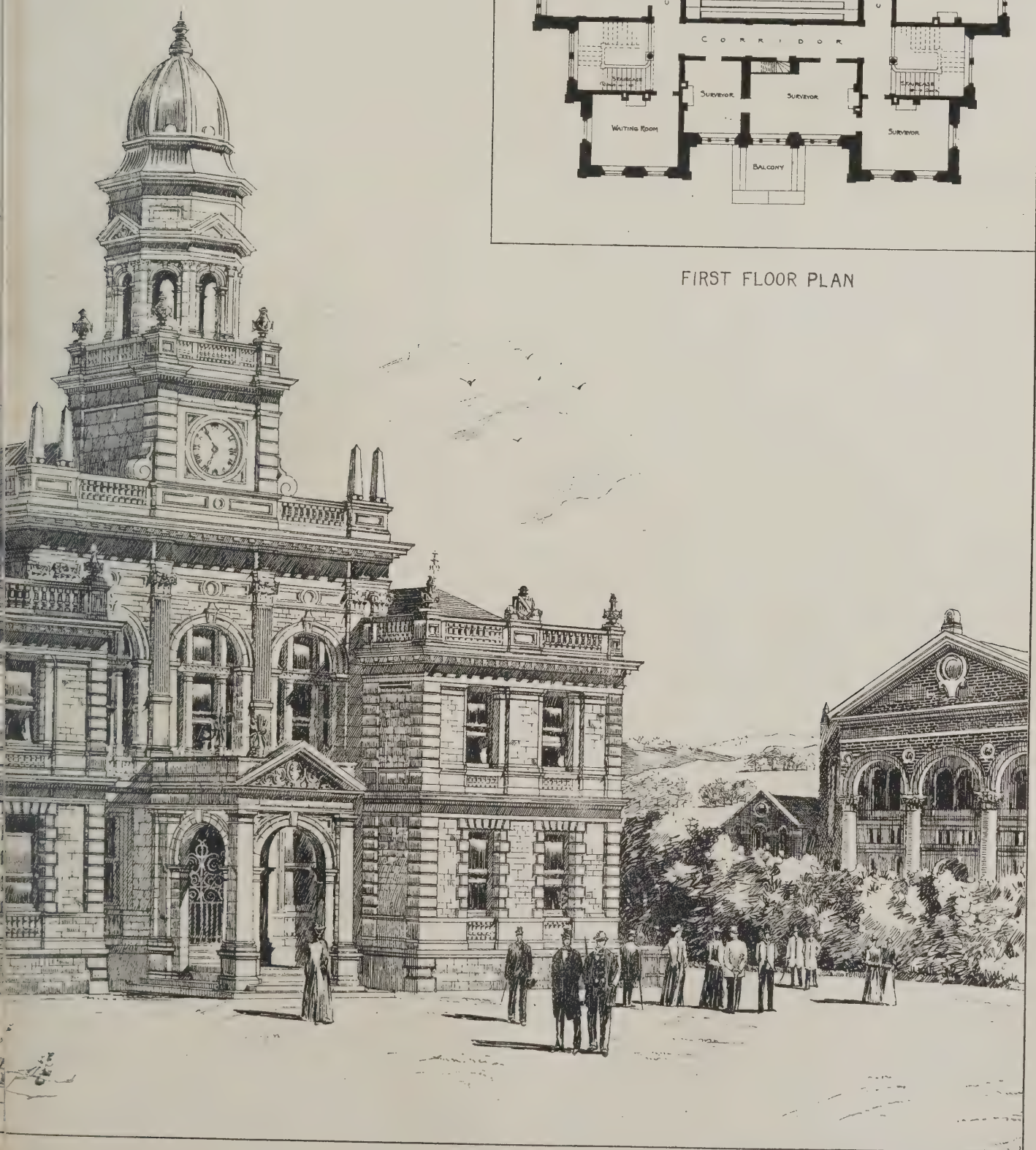
Oct. 14, 1892.

TOWN HALL.

(ATED) W^m GRIFFITHS ARCHT



FIRST FLOOR PLAN



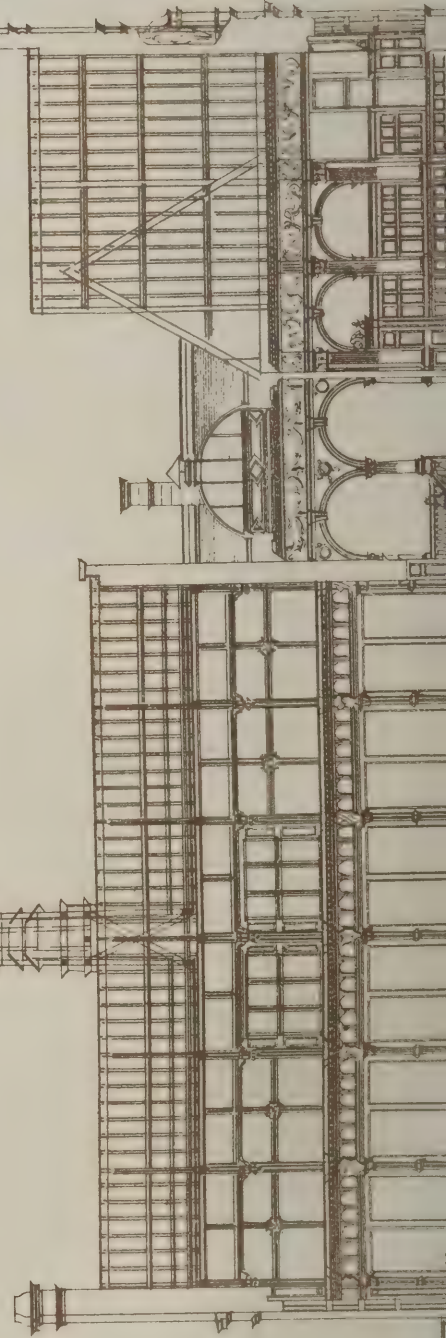
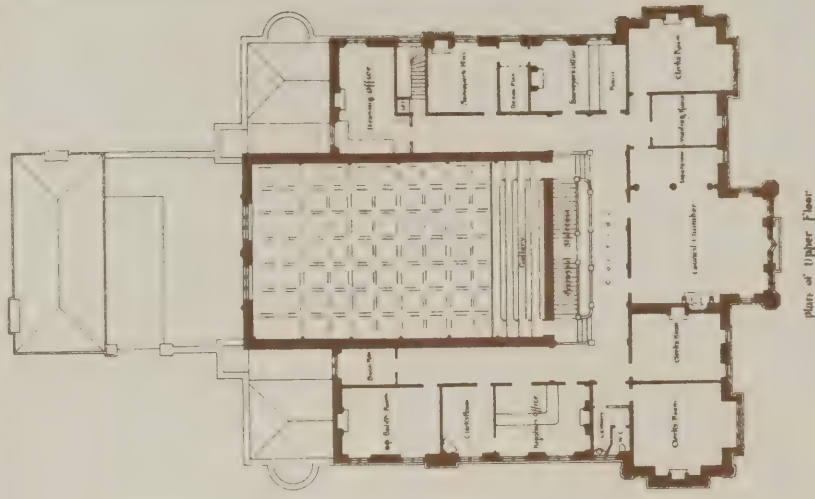
THE BUILDING DEWS, OCT. 14, 1892.

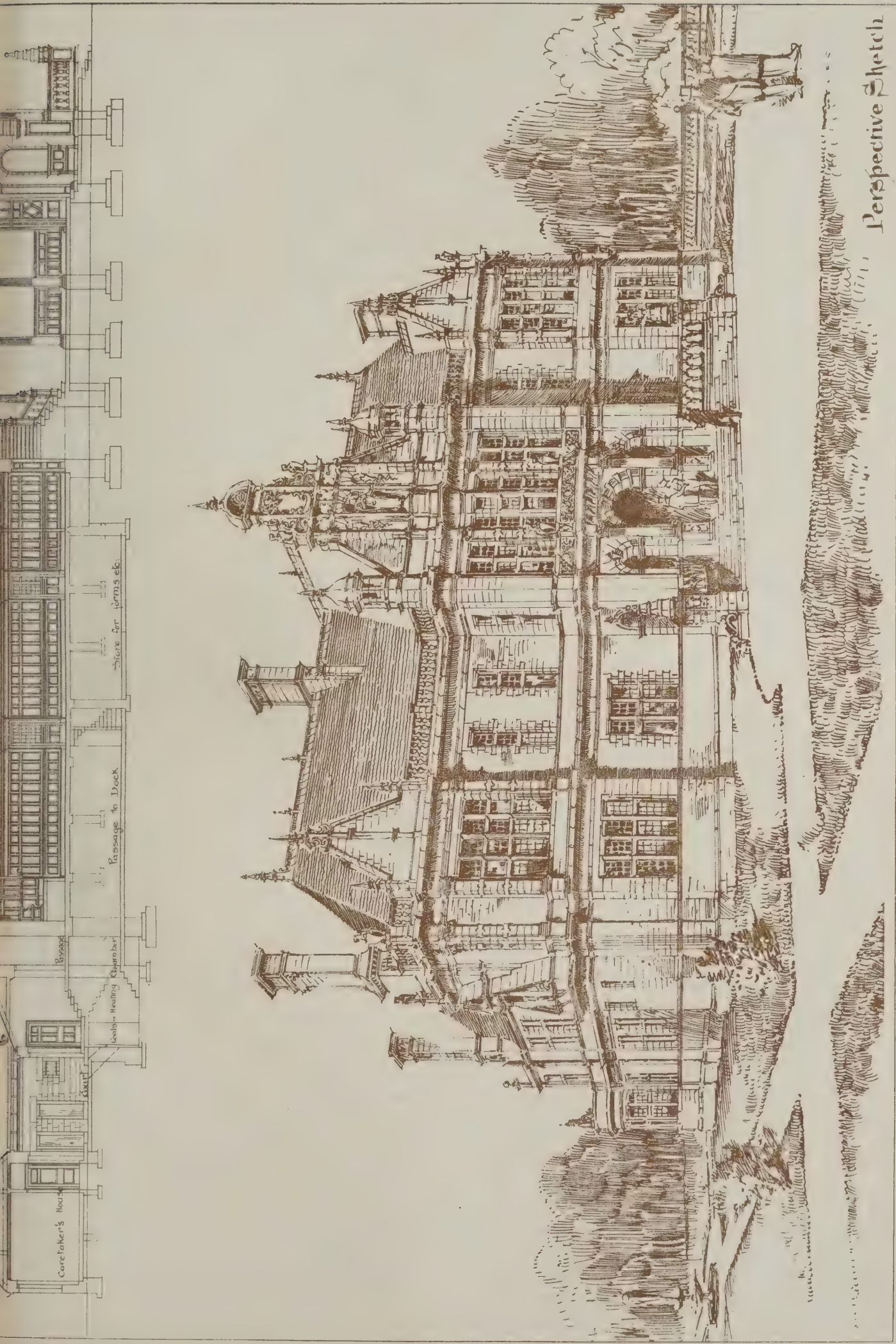
LLANELLY TOWN HALL.

1ST PREMIAED DESIGN. MESS^{RS} SIMON & TWEDDIE ARCH^TS



Longitudinal Section





Perspective Sketch

Photo Lithographed & Printed by James Alberman 6 Queen Square W

THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1972.

FRIDAY, OCTOBER 21, 1892.

ST. MARY'S HOSPITAL—CLARENCE WING COMPETITION.

FIVE designs have been submitted for the proposed Clarence Memorial Wing of St. Mary's Hospital, Paddington, though the committee have not yet come to any decision on the plans, and we hear it is not yet settled who the referee is to be. The new Clarence wing is to be erected on a plot of ground on the south-east side of the present hospital in Cambridge-place, and its main frontage will be towards Praed-street. The main departments required are a medical college with residences at the west end of the wing, an out-patients' department, special wards for male and female patients, nurses' accommodation, besides the usual requirements of laboratory, dispensary, stores, kitchen, offices, &c. The designs submitted are by Mr. H. H. Collins, Mr. Henry L. Florence, Messrs. Stephen Salter and Adams, Messrs. Searle and Hayes, and Mr. Keith D. Young.

The plans indicate generally a careful study of the requirements of the hospital; but are of various degrees of merit in the mode of classification and in the arrangement of the departments. One of the ablest designs—both in respect of the general plan and the elevation—is that under the motto "Economical Administration." The principal entrances are in Francis-street and Praed-street. The former shows a well-arranged registration hall with entrances for male and female patients, with clerks' offices on either side, leading into a large out-patients' waiting-hall 70ft. by 33ft., with consulting and dressing-rooms on each side for the two classes of patients. Four large consulting-rooms are provided, two on each side, with a group of dressing-rooms between each pair. This waiting-hall occupies the centre of the wing at this end, and is placed in line with the axis of the wing. The main entrance-hall in the centre of Praed-street front is commodious, and enters the wing at the end of the out-patients' hall, a corridor giving access to the senior medical staff and secretary's departments, a medical waiting-hall, and dispensary. A corridor connection from the old building is shown.

The first-floor plan shows the out-patients' waiting-hall, glazed over, which gives it a good top-light. The residential medical college is placed at the Francis-street end, and returns some distance in the rear; then follows the matron's department to the Praed-street entrance, and lastly the offices of secretary and his residence at the corner of Cambridge-place. The medical college is chiefly divided into sitting and bedrooms. Connection with the present hospital wards is shown by a corridor near the main staircase landing. On the second floor the main portion of the block towards Praed-street contains the residential medical staff rooms. On the third and fourth floors the wing is no longer continuous, but is broken up into special semi-isolated blocks of wards forming the centre part of the Praed-street façade. These wards are circular-ended where they detach themselves from the medical college at one end, and the lying-in department at the Cambridge-place end. From a hygienic point of view, this detachment of the special wards has much to recommend the plan. A feature which the author has turned to the best account is the architectural grouping of his main

façade. The two wards are placed on the same axis lengthwise, one side of them facing Praed-street. One ward accommodates seven beds for skin diseases, and the other eight beds for ear and throat diseases. Between these wards, running transversely to their axis, is a corridor connecting the second floor of the present hospital. Towards Praed-street a balcony, with columns, is shown, for the use of patients, and between each pair of wards is a sister's room, food and linen stores, and bath-room on one side of the connecting corridor, while a ward scullery and staircase is arranged a little farther along the corridor. About mid-way between these outside wards and the present building are two circular wards for ophthalmic cases, five beds to each, and these wards are placed one on each side of the corridor. At the angles of the outer wards, isolated lobby conveniences for slops and closets are shown, these being octagonal in plan, and made to form turrets at the angles of the end blocks, in Praed-street, a very artistic mode of treating them. We may simply add that the lying-in block for six beds at the corner of Cambridge-place forms the corresponding wing to the college, and completes the wing on this front. In the upper floors are the nurses' cubicles. The external design is shown by elevations of red brick and terracotta of five main stories, with high hipped roofs over the pavilions and end blocks. A centre turret crowns the central roof; the end blocks are well massed, with octangular turrets at the angles, these being utilised as conveniences. The corbelled-out balcony to the central pavilion portion is a good feature, and the circular ends of the pavilions are artistically managed, and give variety to the main front. A well-drawn ink perspective is sent. The high roofs are of green slates, which will harmonise with the red brickwork.

A very elaborate set of plans is that bearing the motto "Ad Rem." There is much less of that skilful grouping and classification we have in the first mentioned; the plan is broken and irregular, and the upper corridors and special wards are less studied. A large waiting-hall, 50ft. by 39ft., with medical and surgical consulting-rooms on opposite sides, with dressing-rooms in connection, occupies the western block. The registration-hall, with waiting spaces for male and female patients is provided. A long corridor along the Praed-street side, with main entrance to senior staff and secretary's rooms, has a dispensary at the end, and this corridor is well lighted by large courts. The entrance for lying-in department is at the Cambridge-place end, with reception and undressing-rooms, lift, and conveniences. On the first floor the medical college is at Francis-street end, then follow the administration department and the special wards for ear and throat, 39ft. by 22ft. each, for eight beds, and two for ophthalmic cases, and the lying-in wards. These wards are placed lengthwise to Praed-street, with access by a glazed back corridor, and a balcony in front. The corridors are well lighted by the courts. The access and conveniences are generally well considered. The same arrangement is repeated on the next floor. Unfortunately, the irregular grouping of the plan has marred the elevation towards Praed-street, and rendered it extremely lop-sided and ungainly. There is no balance. The lying-in department at the Cambridge-place end is one story higher than the rest of the façade, and has an octagonal turret at the corner, while at the other end there is no wing, but another angle turret. The main entrance is crowded and one-sided, producing a jumbled appearance. The details of ventilation and warming are shown in a special sheet of large-scale drawings.

Next in order of hanging is "In Memoriam," in which the author has intro-

duced a departure by placing his wards in four pavilions at right angles to Praed-street, and at certain intervals, these being utilised as garden spaces—an admirable idea if more area were obtainable. The out-patients' department is in the basement, where a large waiting-hall and consulting-rooms are shown. The principal ground-floor entrances are too narrow, and the main corridor appears from a general view of the plan to be badly lighted; the medical staff corridor in centre would be dark. We also object to the corridors being set side by side. The first floor shows accommodation for the college bedrooms, matrons' and nurses' cubicles, in isolated pavilions separated by gardens; the next floor repeats the nurses' cubicles, and the third floor is appropriated to the special wards for six beds, each connected by a corridor with conveniences between the pavilions, of which there are four. Externally, the Praed-street front is shown in a coloured elevation representing red brick as the material, the four five-storied blocks or pavilions having their ends to the street. From a hygienic and architectural point of view, this arrangement of blocks would have the merit of imparting variety and good light and ventilation, as each ward could be cross-ventilated; but the plan of the departments and official and administrative offices is not satisfactory on the whole.

"Fleur de Lys" is a well-devised and drawn set of plans. There is a good main entrance at the end of Praed-street, near Cambridge-place, with corridor running along the block. The consulting and examining rooms are placed towards the front with a large outpatients' visiting-hall of considerable length, divided into three bays, corresponding to the three consulting rooms behind, its principal entrance being from Francis-street. On the first floor the board, secretary, and medical superintendent have rooms in front, and behind a centre wing is thrown out for resident officers, sitting-rooms, &c. The next floor is occupied by the male special wards, skin and dental cases, ear and throat patients in front, and ophthalmic wards in the back wing; the lying-in department at the corner between it and residential college. The third floor is devoted to the female patients in the centre of main front, and the lying-in wards, &c.; the two upper floors being divided into cubicles for nurses. The architectural treatment of this design is conceived in quite a palatial style, massive and dignified in the line of its fenestration, cornices, and parapets, and more suited for a dressed stone façade than for brick. There is a curb roof, but no salient features to break the skyline of the main fronts. On the whole, the departments are well classified, and light and ventilation are studied.

The design "Sursum Corda" is characterised externally by a neatly-arranged front façade of brick and stone dressings, gabled at centre and at wings, five stories in height. The main entrance in Praed-street is central, with consulting-rooms right and left, and an out-patients' waiting-hall behind in connection with entrances for male and female patients in Francis-street. In the basement are drug stores; the secretarial department is on the first floor, where are also the special wards for lying-in cases. The second floor is mainly given up to bedrooms for the residential college, &c., and the next floor plan provides for the special wards for ear and throat, skin and dental cases, with nurses' cubicles in a wing at the back. The plan of wing resembles that of "Fleur de Lys" in its general shape or outline. The college in the Francis-street frontage forms the first return wing to the left, and is chiefly devoted to sitting and bedrooms; the special wards on the third-floor form the inter-

mediate portion of the letter **W** and face Praed-street, the centre projection at the back are the nurses' cubicles near main staircase, and the right-end block is the lying-in wards. The arrangement is wanting in classification, and the corridor and internal communications are defective in light. The separation of the departments, especially the out-patients from those indoors, is very necessary, and this separation ought to be accomplished without losing sight of easy and direct intercommunication for the surgical and medical staff, both in the new wing and between it and the main building. Lighting of corridors and cross-ventilation of wards are also conditions of good planning that ought not to be overlooked.

The site for the new wing, the foundation stone of which was to be laid this month, is now being cleared of the old and dilapidated houses which stood between the existing hospital and Praed-street, towards which the principal front will be. The present hospital of red brick, without any relief, is certainly an ugly and extremely heavy structure, which the new wing will, or ought to, do something to redeem.

THE LICENSING SESSIONS OF THE LONDON COUNTY COUNCIL.

ONCE more the caterers for public entertainment have thronged the sessions houses at Newington and Clerkenwell, applying to the Theatres and Music Halls Committee of the London County Council for the recommendation to the Council of the renewal of old, or the granting of new, licenses for music, dancing, and stage-plays. The interest taken in this annual meeting of the licensing authorities is not confined to the applicants only; the public at large watch with eager interest the decisions pronounced by the chairman of the committee. Many of the listeners are interested parties in a monetary sense, for now that music halls are run by limited liability companies, the refusal or granting of a license, means a considerable difference, one way or another, to the income of the shareholders, especially where such large dividends, as we read of, are paid.

No voice could speak louder of the growing tendency of the public taste for something, shall we say, lighter in the way of performances, than the fact that four well-known London theatres appeared in the list, as requiring music and dancing licenses from the Council, in lieu of the license already held by them for stage-plays, granted by the Lord Chamberlain. It is worthy of consideration how far a structure designed by an architect for one specific purpose, is a fit and proper building for a totally different usage. To our minds the requirements of a music hall are distinct from those of an opera house, or a house built for the drama, comedies, or comic operas. Each and all of these have their own peculiar requirements. In a music hall the audience is essentially a moving one; while in a theatre it is a stationary one. In the first, the people leave their seats, walk about, and return to them, or not, at will; while in the latter, they remain seated the whole time the curtain is up. The particular movements of the audience, must, therefore, require particular provisions on the part of the architect; and further, a moving and circulating audience will be of a greater number in any given theatre, than a seated assemblage in the same house; the question of the adequacy of the available exits is, therefore, one to be seriously considered, apart from the internal arrangements and fittings in converting a theatre into a music hall. It is not all a "question of smoke."

It is unnecessary to mention to our readers that this last question, is not one that is likely to be overlooked by the Theatres and Music Halls Committee of the Council;

we may all rest assured that that body exercises to the full the powers conferred on them by law, with regard to the provisions for the safety of the public; and were they not to do so, the public would cry out with a loud voice, that the men they had elected to look after their interest, safety, and welfare were neglecting the duties they had promised to perform, duties which are not only moral, but imposed upon them by various Acts of Parliament. One of our contemporaries appears to complain that: "the position of a lamp, the particular doors to which certain bolts are fixed, the determination of what is a gangway," should not be matters which affect the granting of a license. We contend that, if upon these matters, the safety of the public depends, the Council are but fulfilling their public duty in seeing that the defect are remedied. Small matters should not be overlooked, for they do "often carry with them very weighty consequences."

It is not our intention now to enter into a discussion upon structural matters, but we cannot help expressing our surprise at the number of places which still appear to be undergoing structural alterations. After the lesson, taught by the Theatres Committee in previous years, in refusing licenses where the works had not been carried out in the specified time, or in a manner to satisfy their superintending architect, it is a matter of wonder that applicants, who still had works to carry out, could allow the annual licensing day to approach, without completing the necessary alterations. On this score, it appears, the committee again stated that they would recommend the full Council to refuse certain licenses where the works were incomplete. This seems to us a matter requiring the architect's attention. The Council have declared that they will not grant a license unless the premises are complete to the satisfaction of their architect. It is, therefore, the duty of an architect to see that his client is armed with a certificate of the Council previous to appearing before the licensing body.

This applies with equal force to old applications, where works have to be done, as to new applications; for in the latter category, several licenses were refused, because the plans were not approved, and it is understood that the chairman of the bench, informed the applicants that as they had no certificate of the Council, they, the committee, were not entitled to grant a license; and in other cases they were told that their plans had been sent in too late to enable the Council to intimate to the applicants through their superintending architect, the defects shown in the drawings; and much too late for them to remedy the defects in the building, so as to bring it within the rules and regulations of the Council, in order to obtain the required certificate.

Here is another lesson for the architect who has clients requiring a music, dancing, or stage-play license of the L.C.C. Apply early: for this is certain, that it is necessary to ascertain in what way the structure, if it exists, or drawings, if the building is to be put up, must be amended, so as to comply with the rules and regulations of the Council. Apply early, so that when a notice has been served, or intimation given, as to what alterations are required, the works may be carried out and the certificate obtained under the Council's seal, before the licensing sessions.

Another class of cases before the committee were those where the owners have found their present premises too small for the requirements of their business, and they have determined to enlarge and alter the existing building to meet the demands of their patrons. These cases have been classed with others upon which the Council have served their notice for structural alterations, and the public press have ignorantly complained of requirements "practically en-

tailoring rebuilding" being imposed upon owners who are voluntarily altering their buildings. But whether the work be voluntary or not, the Council insist upon the due completion, while considering the renewal of the license; no alteration of any kind whatever is allowed without the previous consent of the Theatres Committee.

Turning to the legal aspect of this affair, the Council, as successors to the Metropolitan Board of Works, are, under the twelfth section of the Metropolitan Management and Building Acts Amendment Act, 1878, empowered "to make, alter, vary, and amend such regulations as they may think fit with respect to the requirements for the protection from fire" of places of public resort, to be kept open for the public performance of stage-plays and music and dancing. After the making of such regulations, the Act says: "It shall not be lawful for any person to have, or keep open, any such house, room, or other place of public resort for any of the purposes aforesaid, unless and until the Board (now the Council) grant to such person a certificate in writing under their seal to the effect that such house, room, or other place was on its completion, in accordance with the regulations made by the Board in pursuance of the provisions of this Act for the time being in force, and in so far as the same are applicable to such house or other place, and to the conditions (if any) annexed thereto by the Board.

"In case any such house, room, or place of public resort, is opened, or kept open, by any person for any of the purposes aforesaid, contrary to the provisions of this enactment, such persons shall be liable to a penalty not exceeding fifty pounds for every day on which such house or place of public resort is kept open as aforesaid."

From this it would appear, that, even, if it were possible, were a license granted to premises not holding a certificate, the owner would still be liable to the penalties mentioned in this section of the Act; for it is the non-holding of the certificate—not the license—which carries the penalty imposed here. The penalties of the licensing Acts are apart from this and do not concern the architect. It is certain that the architect must make his structure comply with the regulations, and that he must obtain the certificate before applying for the license. Applicants, with the law so clearly set forth before them, have only themselves to blame for the refusal of their licenses on the score of the unfitness of their buildings; if they ask in time, they can find out whether or not their premises can be altered so that they can obtain the desired certificate before the licensing day.

There is another point we must not pass over—that is, the power the Council have of granting provisional licenses under the thirteenth section of the same Act. It does not seem to be generally known that "a person interested in any premises about to be constructed, or in course of construction, which are designed to be licensed and used within the Metropolis for the public performance of stage-plays, or for public dancing, music, or other public entertainment of the like kind, may apply to the licensing authority for the grant of a provisional license in respect of such premises."

"The grant of such provisional license shall, in respect of the discretion of the licensing authority and procedure, be subject to the same conditions as those applicable to the grant of a like license which is not provisional. A provisional license so granted shall not be of any force until it has been confirmed by the licensing authority; but the licensing authority shall confirm the same on the production by the applicant of a certificate by the Board (now the Council) that the construction of the premises has been completed in accordance with the regulations and conditions made by the Board as herein-

before provided, and on being satisfied that no objection can be made to the character of the holder of such provisional license."

In new cases, therefore, the drawings should be passed by the Council before the work is commenced, and a promise should be obtained that the certificate shall be issued on the completion of the work in accordance with the approved drawings. Upon this, before spending any money on building, the applicant can go to the Licensing Committee and ask for a provisional license. He can, in fact, be secure of his license provided he carries out the plans, and is of good character, &c.

The majority of new applicants, however, at the recent sitting of the Theatres and Music Halls Committee, seemed to be those who had built first, and thought afterwards that they would like a license, or who had been frightened into a belief by recent police court convictions, that the business which they were carrying on at their premises was illegal without a license. Certain parties have been convicted and fined for keeping open certain houses, rooms, &c., because they had no certificate; this does not seem to have been at all clear in the minds of the applicants. It does not matter how good and fit a building may be, the rule applies: No certificate, no license.

Where a building has been licensed for some time, and the Council have required works to be done during the year, when such works are finished, it would appear that it is the custom of the Council to issue, what is known as, a certificate of completion, stating that the works have been done to their satisfaction. Our advice to architects is to have their plans approved and a provisional license obtained before commencing work; and where the building already exists, to make it comply with the Council's regulations, and obtain a certificate before applying at the October sessions, and, above all, to open their negotiations with the Council in time to do all the work (if any) required before licensing day of next year. Then there will be fewer disappointments and less heart-burning and expression of feeling in open court.

BEGINNING AT THE WRONG END.

A MIGHTY war of words has been going on in our hearing for the last year or two. "Is Architecture a Profession or an Art?" "Shall Fellows be still admitted to the Institute on the present system?" "Should examinations be compulsory on everyone who aspires to practise as an architect?" These, and others like them, are the matters that have been earnestly discussed; and, on the surface, some of them seem too unpractical for busy men to spend their time in talking about. What does it matter to them whether the business of their life is described as an art or a profession? Call it which they may, they will carry it on no worse and no better. Give some dull plodder the title of artist, and you will not make him one. Give some erratic genius the name of "professional adviser," and he will be no staidier than he was before. So it looks at the first glance. But in this war, as in many others, the real subjects in dispute are very different from, and very much more serious than, the nominal ones. The question which really divides the disputants seems at bottom to be this: "Can a man's faculty as an architect be truly gauged by any form of examination?" If it can, and if the required form of examination is really practicable, then, it would seem, there is not much left to dispute about. But to devise the examination is the difficulty. It is easy enough to ascertain by examination what statements a student has learned. Morning, noon, and night we are hearing all over the country of examinations like these—to believe in them is the great super-

stition of the age. But an examination as to actual capability is quite another thing. We may see, perhaps, its small beginnings here and there. They may die out, or they may grow and expand until we shall be able to test not merely what a man has read and remembered, but what practical work, artistic or other, it really lies in him to do. If we ever manage that we shall have an examination worth passing.

Examinations in capability, like those in learning, would, of course, be progressive. There would be an early and much-needed one, to ascertain whether an intending student was likely by any amount of training to be shaped into an architect. There would be intermediate ones, to see how the shaping was going on, and if the capability was being strengthened as it should be; and there would be advanced or final ones, in which the work that an architect actually had done should be the main thing to count, and in which the examination should only serve the purpose of a check, to prove that he had indeed done it himself. Each would have its appropriate tests of faculty, and our purpose now is only to suggest one among them. It would be too severe for the first examination, and too easy for the last; but in the intermediate it might be of great value. It turns on the fact that almost every plan—almost every design—almost every detail contains a problem; and it consists in ascertaining at what point, or at which end, the candidate would begin in attacking the particular one that happened to be set him.

By nature every student seems to begin at the wrong end. The pupil in his early years is irresistibly impelled to draw the elevation of his building before he has thought about its plan. He goes on the same principle in attempting details, and shows the lines of his arch-mould or his cornice before he settles the section of them. If he is dealing with a bay-window, he first of all sets up the outside of it, and fills in all the ornament; then he makes a section, carefully omitting the floor and ceiling lines; and lastly draws a plan. The interior he commonly omits entirely; and, of course, he does not concern himself with the sizes of casement frames or sash boxings. He has produced a neat drawing, and it is very difficult for him to understand that it is a worthless one. You put in for him the floor and ceiling line of the room which the bay belongs to, and it turns out at once to be too high or too low. You mark the walls of the room against his plan of the bay, and it proves, perhaps, to be too wide for the position. You set out the sash-boxing to a larger scale, and it takes up so much of the thickness of the wall that there is no room for the mouldings and the ornament which he began by showing. From end to end of his work there is scarcely a line which can remain, and when the rubbing-out process is complete, a deep disappointment settles down on the youthful aspirant. He had taken trouble, and had done his best; it does seem to him that you might have passed it, at least, with a few trifling alterations. Yet how was it possible? He had begun it all at the wrong end.

The young student has generally some knowledge of geometry. He would admit, in the abstract, that the greater cannot be contained in the less. To admit a truth and to act upon it, however, are two very different things, and his daily practice will flatly contradict the principle which his reason assures him must be true. It will not make him hesitate for a moment about putting a door 8ft. high into a passage which is only 7ft., or in placing three 4ft. windows and four 3ft. piers in the side of a room not more than 20ft. long. He will not deliberately assert that piers and windows making up 24ft. can be got in to a 20ft. space; but figures give him the headache, and addition and subtraction especially jar upon him, as inconsistent with the dignity of art. It takes

years, perhaps, to make him understand that the first necessity in every detail of a building is to let the detail fit into its place; that before designing a door or a window, it is indispensable to know what space there is for the door or the window to go into, and that all the different things he is drawing are not going to be worked and set up separately in a mason's yard as specimens, but will have to be fitted together to a nicety, so as to constitute a house, or a school, or a church. But for a long time he draws the things first, and ascertains afterwards how large they ought to be. In other words, for half his term of training, and it may be for the whole of it, he begins in this respect at the wrong end.

These are elementary examples of the mistake. But it is not confined to pupils; it is common enough with assistants; it is a characteristic of many practising architects throughout their lives. At one time or another, probably, it has been made by the ablest of men when they have found themselves dealing with unfamiliar subjects. Almost everyone learns in time at which end to begin his ordinary work. He comes to see at a glance which are the fixed factors and which are the movable ones, and he takes the fixed ones into account first. In a new class of building the difference is not equally clear to him. He is conscious of a terrible tangle, but he cannot for a long while discover the knot which holds it all together. Yet such a knot there generally is, and until it is found and untied all other trouble is thrown away. It is not always discoverable by sitting down and thinking. It may be better perhaps to take a pencil and a scale and begin somewhere—anywhere. Such a beginning will not lead to success, but it is likely to suggest, after a while, where the beginning will have to be. That once ascertained, it is possible to start again, to good purpose.

It is needless to remind anyone, except, perhaps, manufacturers of terracotta and moulded bricks, that buildings are, as a rule, begun at the foundations and gradually carried upwards. Firms in the branch of trade just named do sometimes seem to forget the prevailing custom, and, in consequence, deliver the finials and copings before they have made the plinths and bases; but to the rest of the world the practice is sufficiently familiar. Yet, though the execution of a building starts from the bottom, the design of it often originates at the top. This is especially the case in domed and vaulted buildings. The domes and vaults are thought of first, then the sizes and positions of the piers that carry them, and of the walls and buttresses that counteract their thrust. If the process were reversed, the buttresses and piers would be too weak or too heavy, and both would be in the wrong places. It is the same with other kinds of construction, as soon as they become difficult enough or massive enough to require special study. The right end to begin at is to calculate the weights that have to be carried, and then to design the supports for them; to ascertain the thrusts that have to be resisted, and to arrange the abutment accordingly. But the *crux* of a problem does not always lie in such easily-stated things as these. It may be hidden in the planning of a building, or in its section; in its internal or its external design, or in all of them combined. But wherever it is, there is not much to be done till one sees it and recognises it. It has to be tracked out and conquered—that is the end to begin at; and that once accomplished, secondary things generally fall into their right places with little trouble.

Not unfrequently the knotty point in a design is the lighting of the central part of it. The man who begins at the wrong end goes on admirably as long as he is working round the sides of the plan. His arrange-

ment looks satisfactory: his elevations please him; his drawings are getting on well. Then, just as he is hoping to complete a very promising scheme, he finds the middle of his structure in the dark. All he has done must be thrown aside; the labour of days or weeks must go for nothing; he has come at last on the difficulty of the problem, and must begin with it or give everything up. He sees now that it was with the lighting of the centre he ought to have started, and for want of having seen it, he has wasted his time and his trouble. Sometimes, again, the heart of the puzzle lies in getting proper communications across a building. Some way or passage is peremptorily needed at a particular point. It seems a small thing, and yet it cuts the site into two parts, neither of them large enough for the main apartment which has to be provided. Here the passage is clearly the fixed element which it is necessary to begin with. At other times a particular room has to be kept quiet and away from the noise of street traffic. To keep it so upsets some pet idea with which the planner started, and yet, unless he keeps it so, he loses his chance in the competition. Or it may be a question of aspect which predominates. The architect may have sketched out a house-plan, good in arrangement, and admitting of satisfactory architectural treatment. Yet when he sets it out on the actual site, he finds, perhaps, that it will make his most important rooms face the north, or will thrust their windows full on a prospect which would be absolutely intolerable. So he again learns, though rather late, which was the right end to begin at, and has good reason to regret that he began at the wrong one. Experience teaches us all, in these or similar ways, but it is he who acquires the lesson most rapidly that shows the most promise. To begin at the wrong end is not an absolute disqualification if a man has perseverance enough to do his work twice over. To begin at the right end is not all the mystery of our profession, but it is a considerable element in it, and the student who has an instinct for doing it gives a sign of capability which is likely to prevent him from ever becoming a conspicuous failure.

ARCHITECTURE: A PROFESSION OR AN ART.*

AS we were informed was the intention, the volume containing the protest published in the *Times* in March last year against examination and registration of architects, together with various short essays on the qualifications and training of architects, has been published by Mr. John Murray, under the editorship of Mr. R. Norman Shaw, R.A., and Mr. T. G. Jackson, A.R.A., the leading spirits of that movement. It would be impossible in a short article to deal as adequately as we should like with the arguments put forward by the writers against the legislative qualifications of architects. We have so often discussed, indeed, the *pros* and *cons* of the question that it would be superfluous to enter into the subject *ab initio*, or even to reassert all that we have already said in favour of a test of a general kind by which the public may be satisfied with the credentials of any architect they may employ—a test, it must be remembered, not whether he is an artist, but whether he is skilled in those elementary principles of construction and sanitary science as will entitle him to undertake the duties of carrying out any building entrusted to his call. Mr. Jackson, who writes the introduction, attacks first that movement which has instigated all the measures which have been proposed to improve the status and education of architects—namely, the Registration Bill. "Legislation," says Mr. Jackson, "has at last reached the domain of Art, and it has been seriously proposed to charge Parliament with the duty of providing the public with good architecture and properly qualified architects." This, the first sentence of the book, shows the main object the editors

have in view. The sentence we have quoted certainly misjudges the intention of the promoters of the Bill, which nowhere proposes to provide the public with good architecture or to make architects, but simply to insure the adequate instruction of everyone who practises the art in the essentials of good construction and the knowledge of all that contributes to safe and sanitary buildings. We accept the dictum that to a "true artist his art is an individual matter purely between himself and his artistic conscience," and that "no stamp of Government approval on his work can have any value in his eyes." It is perfectly true that any architect worthy of the name would never attach much value to a certificate of merit by a public board, knowing very well what it is worth; perfectly true that he must go his own way and his art must be free. We accept these statements; but they do not apply to the rank and file of those who now enter the profession, and for whom the public board's certificate may be the only guarantee to the ignorant, unsuspecting client. The reference to the arts of painting and sculpture are rather beside the main argument, for, as we say, no examination ever proposes to test the art capacity of the candidate. Mr. Jackson refers to jerry-building. No legislation, he says, could make it impossible, for so long as people insist on having too much for their money, so long will there be jerry-building. We are told that the jerry-builder would pass the examination with flying colours, for in his own way he is a master of construction, or rather how to make the most of a very little. The writer again says that the advocates of certificate and diploma do not think of trying to reform the jerry-builder, but to create a class of certified architects. Replying to the argument drawn from the certificated professions of the Bar or Medicine, we are told that it is not every qualification which admits of the examination test: even in law and physic it is no guarantee that a man will not bungle a case or diagnose wrongly. Lawyers have been known, "in spite of their diplomas, to draw wills which diverted property to the wrong recipient, and doctors to treat a patient for brain fever who was really suffering from inflammation of the lungs." But the chief thrusts are given at the Institute of British Architects.

Referring to Mr. MacVicar Anderson's threefold qualifications of the architect, one who unites the qualities of an artist, a constructor, and a man of business, Mr. Jackson observes justly enough that much of the latter qualification is very simple, and the rest is a matter of tact and experience, as in knowing how to certify for payment, what things ought to cost, &c. It is difficult to assure the public of anyone's qualifications on this head, and Mr. Jackson examines the test questions given to candidates in one of the examination papers of the R.I.B.A. on business qualifications, and shows how inadequate they are to guarantee his proficiency. Only four questions were to be answered, and two of these afforded no proof of one of the three essentials required by the president's definition of the architect. With these comments we leave Mr. Jackson's remarks to the attentive consideration of the profession, and refer to other essays by various writers which are intended to enforce the arguments against registration and diploma.

Mr. Norman Shaw, R.A., writes the first essay entitled "That an Artist is not necessarily Unpractical." He observes that "so far as the Institute of British Architects is concerned, it is too often felt that art is very much thrust into the background, and attention incessantly, and with much agitation of mind, kept concentrated on the 'profession' and the public." The general purport of Mr. Shaw's essay is to show that all the talk about practical knowledge and the diplomas of a qualified and chartered body is very "tradesmanlike and in very poor taste," and so far as the public is concerned absolutely untrue; that the public want good architecture which will interest them, and will be a daily source of delight. In short, that the public, when they employ an architect, are not content with sound construction, but look for art, that they will never be put off with certified surveyors, or officially made architects, however many letters they may have to their names. Mr. Shaw says if an architect designs a really "interesting" work, he will be sought after. "To build beautifully" is the main object of an architect; "if he sits in his office making picturesque

drawings, he may be an accomplished draughtsman, but he is not an architect: if he spends his time in calculating the smallest amount of material that may be used, he may be an engineer and builder, but he is not an architect. Mr. Shaw does not undervalue "business" qualifications when they are valuable to the employer, but a man's "aptitude for business can only be discovered in business," and cannot be ascertained by examination. Mr. Shaw believes that an architect must be endowed by nature with a special gift for the art, and if he has no art faculty, he may, with a very little industry, attain to skill in construction and details; he maintains, in short, that good construction is a part of good architecture, and must influence design, and all great architects have been men of great practical attainments. "A true architect is more likely to be a practical man than a practical man is likely to be an architect." Lastly, Mr. Shaw admonishes the student "to put away all empty talk about the 'profession' and the public," to give up all anxiety to have initials after his name.

The second essay, by Mr. J. T. Micklethwaite, F.S.A., on "Architecture and Construction," is an important contribution, because it shows how very mundane and practical is the Institute's ideal of an architect. The quotation from Professor Kerr's book, the "Consulting Architect," about the different kinds of so-called architects, reads certainly like an irony. Mr. Micklethwaite points to the strange doctrine that there may be professional architects who have no knowledge of architecture, and he shows that such a doctrine has obtained in Conduit-street, for both Professor Kerr and Mr. MacVicar Anderson have included under the term architect a great variety of mixed callings. The root of this misconception is, as he shows, the idea that architecture "is ornament applied to building," a luxury that may be added to or "laid on" if you choose to pay for it. As to the claim of the Institute as really representing the architects of Great Britain, he says it is "too shallow to be maintained." Alluding to the threefold division of architects, the writer says truly there is plenty of honest work for a business architect to do; he may be a house agent, or land-jobber, but has no claim to the title of architect. "If there is a slaughterhouse or a coal-store to be built, and there is a man who knows exactly what is wanted, and how it may best be had, by all means let him have the work to do, but do not call him architect—a 'prosaic building director with Professor Kerr,' if you like, but not an architect." Speaking of the artist qualification, the writer says construction is a necessary condition of architectural design; architecture being building beautifully, it is, in the first place, building. Stress is laid on the fact that architecture is not overlaying building with ornament, but is a quality inherent in a building; that the work of the architect is not the drawing of pictures, but the designing of buildings.

After a paper by Mr. Reginald Blomfield, M.A., on the "Institute Examination and Architecture," the remarks on the inaptitude of examination tests, and on designs submitted by examinees to examiners in the following essay by Mr. G. F. Bodley, A.R.A., are very much to the point, and worth perusal. The other essays, by Mr. Mervyn Macartney, B.A., on "The Protection of the Public," and on "Architects and Surveyors," by Mr. Ernest Newton, are in the same general keynote. Mr. Edward S. Prior, M.A., writes a clever essay on "The Ghosts of the Profession," which contains some unpalatable truths for professional architects. Mr. Prior remarks: "Some architects have not run in the professional ruts, but have disregarded the emoluments which reward the conventional professional success . . . but these have not generally been successful men. Their names are not found in histories of modern architecture, even when re-edited. . . . Indeed, many of the real architects of this century have not been accounted at all." Much more in this strain may be found in other essays. Mr. John R. Clayton writes on "The Isolation of Professional Architecture from the Arts"—a subject we lately discussed in these columns, and this isolation has been fostered by the Institute. Mr. Basil Champneys, B.A., has an able essay on "The Proper Relation of General to Technical Education"; W. R. Lethaby one on "The Builder's Art and the Craftsman"; W. B. Richmond, A.R.A., on "Thoughts on Three Arts and the Training for

* "Architecture: A Profession or an Art." Edited by R. NORMAN SHAW, R.A., and T. G. JACKSON, A.R.A. London: John Murray.

them"; Gerald C. Horsley on "The Unity of Art," and Mr. T. G. Jackson's concluding essay on "True and False Ideals on the Education of an Architect," to which essays we can only refer. The tone of them is high; the authors counsel the profession to think more of architecture and less of the profit and position of the architect; everyone rebukes the Institute for its pandering to the commercial side and not doing more as an institution of architecture. As to the question of examination, it is looked upon in much the same manner as journalists in this country regard the course of journalism which has been established in the University of Chicago.

ARCHITECTURAL ANTIQUITIES OF THE ISLE OF WIGHT.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

THE concluding part of Mr. Percy G. Stone's admirable work issued to subscribers under the above title has now been published. The present volume comprises the Domestic work of the West Medine, and naturally enough the Royal Castle of Carisbrooke occupies the most conspicuous place in length of description and number of illustrations. These latter include some specially prepared photographs and measured plans with geometrical details of all the parts retaining points of architectural interest. The chapel of St. Peter is carefully restored by Mr. Percy Stone in plate 124. The history of the fortress is amplified with copious notes, bringing its record down to the present time, and noting, by the way, Hardwick's over-restoration of the fabric in 1856. Chale Manor, a small farmhouse with walls and windows of 14th-century date, is one of the most interesting domestic buildings in the island, and was erected by John de Langford, Constable of Carisbrooke Castle, in the days of Edward III. There is also an interesting barn with buttresses to the walls, as in the well-known Somersetshire examples, and possessed of at least one old original principal of the roof. Cowes Castle, Kingston Manor, and Mottistoun come next in order in the book. Of the latter, by the author's permit, we give herewith, among our plates to-day, a plan, view, and elevation. The house stands on the high road from Ventnor to Freshwater, and was the ancient home of the Glamorgans and the Chekes. One of the latter family, "a lewde sonn of a discrete fathor," sold the property to Sir Robert Dillington, of Knighton, whose descendant, Sir Tristram, sold it again to John Leigh, of North Court. The house dates from the first part of the 16th century. The main body of the house was probably remodelled about 1567, the date cut in a panel over the entrance porch. The eastern wing was presumably relegated to the servants' use as domestic offices. Nearly all the internal door openings are of stone, with flat-arched lintel heads and splayed and stopped jambs, but the house is sadly out of repair. Newport furnishes some picturesque bits of work, and the grammar school is an unambitious and quaint building. North Court, of which we are enabled to give a view, is perhaps the most stately manor-house in the Isle of Wight. It is pleasantly situated on the south-eastern slope of the down overlooking the sea. It never seems to have been of the conventional Jacobean type of manor-house, but appears to have been modelled more on the lines of the more important mansions to be found on the main land. The entrance front has been retrievably metamorphosed by the insertion of ash windows, but the garden side is much as when it was built. Over the porch is cut the coat of arms of the Leighs, argent, on a chief embattled sable, three plates, with the date 1615. The south and east fronts are picturesquely roken with angle-canted bays of two stories, unmounted, like the gables, with quaintly elaborate finials. The view of the house from the south-east angle is an imposing one, gaining much from its foreground of formal garden and the little stream that here runs through the grounds.

Among the smaller specimens of historic domestic architecture brought before us by Mr. Percy Stone are Shalcombe, Simerston, and Rowbrough. Sheat is a bigger place, with a grand chimney-piece in the dining-room, and Swainston is a pretty little chapel and hall. West Court and Wolverton are good small houses, and Lymington is made the most of by Mr. Downes's artistic, but almost too magazine-like,

sketches. So conclude the plates, which number 146 full pages, besides numberless marginal illustrations. The volume concludes with historical references and quotations both on the churches as well as houses of the West Medine, which cannot fail to be of interest to the local antiquarian, and they must have been the occasion of much patient research among many curious authorities giving customs and manners of bygone times. In an appendix form are inventories of church-plate and chattels, with an account added of the alien priories in the island. The printing both of the plates and letterpress is excellent, and the work has been published by the author at his offices in Great Marlborough-street, W.

ROAD AND FOOTWAY BLOCKS.

WE have never desisted from finding fault with those systems of road-paving which appear to be made for the very object of causing a slippery surface and of making it difficult for horses to keep their feet. In spite of continual warnings, little has been done in this direction; but we are glad to call attention to the road and footway blocks which the Patent Composite Block Road and Paving Company, Ltd., of East-side, Newport, Mon., has introduced. Mr. William White, the inventor of the Hygeian Rock and managing director, has, we believe, been for a long time engaged in perfecting the system, which combines the merits of asphalt and macadam without those drawbacks which have generally been discovered in their application to roads. A roadway combining the qualities of durability, cleanliness, and good foothold has been called for in all great towns. Authorities in London and elsewhere have tried all kinds of pavings of macadam, of wood, and of asphalt, but they have not yet succeeded, simply because the condition of foothold has been neglected. The patent composite block is of any required shape or size; small granite cubes are imbedded in a layer of composition made of asphalt and other materials, and these layers are attached to blocks or slabs of cement concrete. The blocks are, by means of dovetailed apertures, made to unite with the composition or base. The granite cubes inserted in the composition make an excellent foothold. Two varieties of paving blocks are manufactured. First, blocks prepared with a base of the best cement concrete, and faced with a layer of impermeable composition, which firmly adheres to the concrete base, and is also keyed to it by means of dovetailed apertures, and on the wearing surface are imbedded pieces of road metal broken to any required size. These blocks can be made of any thickness, shape, and dimensions. The surface may be ridged, grooved, or plain, or to any desired pattern. Secondly, blocks prepared with the same composition, but without the base of concrete, with a framed grating or gridiron of timber imbedded therein. These can also be cast to any size, shape, or pattern. For heavy traffic the second class of block is recommended, 6in. thick, having a weight of 392lb. a square yard. For light traffic, blocks of the first kind are preferred, and these have already been tested. Their cost is rather less than those entirely of composition, but their weight is 576lb. to the square yard. For passenger traffic either kind would suit, or a block of concrete 2in. thick, faced with a $\frac{3}{4}$ in. layer of composition. For stables, cattle markets, and other purposes grooved blocks of 2 $\frac{1}{2}$ in. to 3in., as shown, would be suitable. One great advantage of these blocks is the rapidity with which they can be laid on concrete foundations, and the facility with which repairs or openings of the roads for drains and pipes can be made by simply cutting out the groove or joint, and removing the blocks. The results of experiments made to find the resistance to bending stress of these blocks made by David Kirkaldy & Son are instructive, and prove the remarkable strength possessed by the composite slabs.

THE LONDON COUNTY COUNCIL AS THEIR OWN CONTRACTORS.

THE London County Council discussed, on Tuesday, the long-mooted proposal that they should in future do their own building work without the intervention of a contractor. The question arose on the report of the Bridges Committee with regard to the proposed erection

of artisans' dwellings for housing the persons displaced by the making of approaches to the Blackwall Tunnel. The committee reported that the Council had referred to them the several tenders for the erection of artisans' dwellings on the Yabsley-street site. On further consideration they thought that it would be more economical if the Council were to erect the buildings; by so doing they would save the extra cost which would be represented by the contractor's profit, and also the expense of supervising the work. The Council, moreover, could rely upon having the best materials and workmanship, and at the same price that would be charged in the first instance to contractors. They therefore recommended—"That the Council do erect the artisans' dwellings to be constructed in connection with the Blackwall Tunnel scheme, without the intervention of a contractor, and that the Public Health Committee be authorised to take the necessary steps for carrying out the recommendation." In the discussion which ensued, Mr. John Burns, M.P., and Mr. J. Williams Benn, M.P., strongly supported the recommendation of the committee, and advocated that the County Council should carry out the whole of the building operations. Mr. Burns stated that for four years he had consistently advocated the Council having a distinct building department and a committee of works. He denied that those who supplied contractors with plant would not sell to the London County Council, and read a letter which had been received from an eminent firm offering them material on advantageous terms. Sir J. Lubbock, M.P., warned the Council against embarking on this step without further inquiry, and proposed an amendment instructing the committee to reconsider the whole question. This and other amendments were negatived, and the committee's recommendation as far as the word "contractor"—viz., the motion to proceed with artisans' dwellings—was carried, with an instruction to the committee to report as to the best manner in which such works could be carried out in future.

THEATRES.—X.

By ERNEST A. E. WOODROW, A.R.I.B.A.

IT has often occurred to me, that sufficient stress is not always laid upon the importance of the arrangements for the admission of the public into a theatre. All of us, who have been frequenters of the pit of some of the popular playhouses, must admit that we have had some very uncomfortable quarters of an hour—or even whole hours—in waiting for the doors to open, and when they did open this discomfort was brought to a climax. I have elsewhere endeavoured to point out that much of the nervousness among women, and those of a highly-strung temperament, is due to the disgraceful way in which the British public have been in the habit of struggling and fighting into the pit and gallery of our theatres. Where great difficulties are felt in obtaining access to the seats, the idea of an equal, or greater, difficulty of gaining egress, is nursed by the weaker minds during the whole of the performance, destroying all sense of enjoyment, and creating a state of nervous excitement, ready to burst into a cry of alarm at the slightest cause. It requires but the voice of one over-wrought person to start the whole audience into a mad stampede, fire or no fire; on the other hand, it requires but the presence of mind of the whole audience to secure a safe departure, however fierce the fire, and however well founded the alarm. The lesson that our security is in our own hands cannot be taught too often.

What I would now dwell upon, is this—that the plans made by the architect for the admission of the public, should be such, as to prevent all overcrowding, and allow the most delicate and sensitive woman or child to walk into a pit or gallery without any discomfort or feeling of fear. This can be done, and in several of our new theatres has been, and is being done; the way to do it has been learned from our Continental neighbours. Who could imagine a Parisian audience behaving like a Boxing Night crowd? It needs a certain amount of moral courage to enter Drury Lane gallery on the first night of the annual pantomime, and, the public have themselves greatly to blame.

It seems almost impossible to teach the public, that the way they have behaved in the past is not the right way; so means must be provided to prevent future recurrence of the disgraceful scenes witnessed nightly at the pit and gallery

doors—scenes of greediness and selfishness which Englishmen should be ashamed of—where the strongest thrust the weakest to the wall, to gain a front seat. First to come should be first served in a theatre, and it is only by the architect arranging his entrances so that the “queue” must be enforced, that this will be brought about. Managers are quickly learning the lesson taught them by Mr. D'Oyly Carte, some years since at the Savoy Theatre, that a large portion of the public who cannot afford high-priced seats, keep

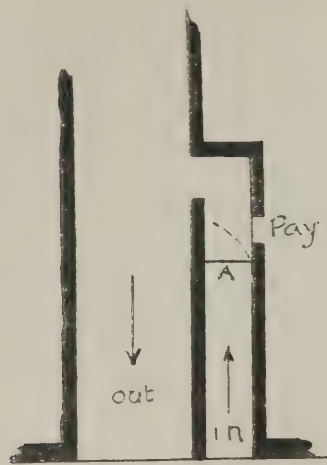


FIG. 1.

away from the theatre altogether, because of the discomfort of the entrances to the “unbooked” parts. Mr. D'Oyly Carte was the first to adopt the “queue” to his pit, and now it is no uncommon sight to see ladies standing outside and quietly awaiting admission to the Savoy pit in Beaufort-buildings whenever there is a *matinée*. This example has since been followed by many managers, and, as I have already mentioned, special arrangements have been made in some new theatres by the architects to carry out the system.

We all remember how the queue was formed by a series of barriers to the lifts of the Eiffel Tower at the last great Paris Exhibition. Such an arrangement worked well with the vast crowds in the open air; but were it adopted in the entrance passage-way of a theatre, which has also to serve as an exit, it would materially obstruct the free egress, and be a cause of very great danger. The exit must remain free at all times, and no system of shifting or movable barriers should be allowed in order to overcome the difficulty. Some modified form of the plan shown in Fig. 1 is frequently adopted, by which the public enter and pass the pay-box one by one in a narrow passage; after the pay-box is reached, the stream diverges into

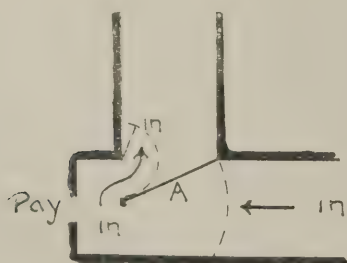
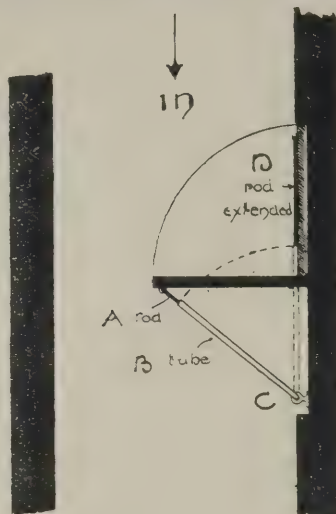


FIG. 2.

the main passage-way, which is left free and unobstructed, its full width, for the purposes of exit. Such an arrangement works admirably. The people can wait in a line in the street under the shelter of a permanent awning; the bolt of the small entrance door at A can be released by the money-taker pulling a lever from the pay-box, and the audience walk quietly in one by one, knowing that no amount of struggling will permit them to pass those in front, or gain a superior seat in the theatre. Several variations of this system are adaptable to the various exigencies of different cases.



In Figs. 2 and 3 a plan is shown where the entrance passage has a turn at right angles. Here the people enter and pass the pay-box, as in Fig. 2, where the letter A indicates a barrier kept in position by an automatic bolt or fastening on the inside; as they go out, this barrier falls back by simple pressure in the position shown in Fig. 3. B is a door to close the space before the pay-box in case anyone when

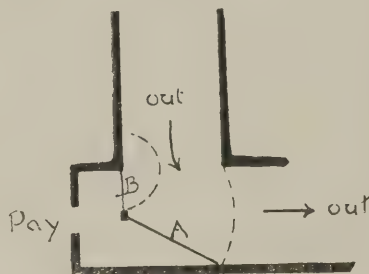


FIG. 3.

going out should be pushed aside, and be unable to again enter the stream; this door folds back against the wall of the passage when the audience enters.

Everyone knows that the public have to be brought past the pay-box one by one, and when the pay-box is situated in the main entrance passage-way, the width of the passage-way must be curtailed in some manner, so as to bring the people singly up to the money-taker, otherwise a rush past the pay-box will fill the house with *dead-heads*. Ingenious and complicated provisions of check barriers have been the result of the demand of such circumstances, arrangements which were not always conducive to public safety. The necessity of the presence of barriers, in order to govern the ingress of the people, appears to be recognised by the London County Council, who in a part of their twenty-fifth regulation say that “all barriers and internal doors shall be made to open outwards, with no other fastenings than automatic bolts.” Again, “no locks, monkey-tail, flush or barrel-bolts, or locking-bars, or other obstructions to exit shall be used on any doors, gates, or barriers.”

Barriers should be hung to open outwards, and not have any fastening, so that should a crowd suddenly turn round and rush out before the commencement of the performance, the barriers would give way before them, and fall back against the walls, leaving a free exit. Barriers that have to be lifted out of sockets and carried away, are a great evil; there should be no unshipping or unfastening in any case.

I cannot find anything in foreign regulations to guide us as to what provision is enforced with regard to barriers in other countries. The necessity of the barriers and of their opening outwards has called forth the inventive faculties of managers, and I here illustrate an arrangement patented by Mr. Graydon, from a drawing he has supplied me. It will be seen that

FIG. 5.

one end of the barrier is held against the wall, and travels in a runner, while the centre and other end are hinged. The drawing shows that inward pressure will keep the barriers in such a position that there is only room for one to pass the check-taker at a time, and that directly outward pressure is applied the full width of the passage-way is available. This system is specially useful, where long barriers are required, to bring a crowd gradually to one point. Where a barrier is longer than the passage is wide, it is, of course, impossible to hang it to swing outwards without blocking the passage-way. Mr. Graydon's patent appears to solve this difficulty.

In Fig. 5 I illustrate a very simple method (invented by a “gas-man” of one of the East-end theatres) for holding a check barrier in position without any fastening which would cause an obstruction to an outgoing crowd. A rod (A) of iron or brass, which is hooked into the barrier, is

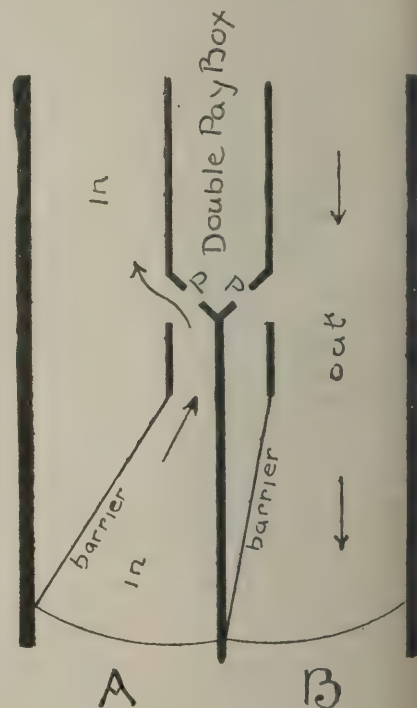


FIG. 6.

placed into a tube or pipe (B); this is attached to the wall (at C). When the barrier is pushed outwards the rod comes out of the tube, extending like a telescope (as at D), the barrier falls back against the wall into a recess formed so as not to diminish the width of exit; the barrier may be kept in this position by a spring or self-locking latch.

We have already learned that all doors should

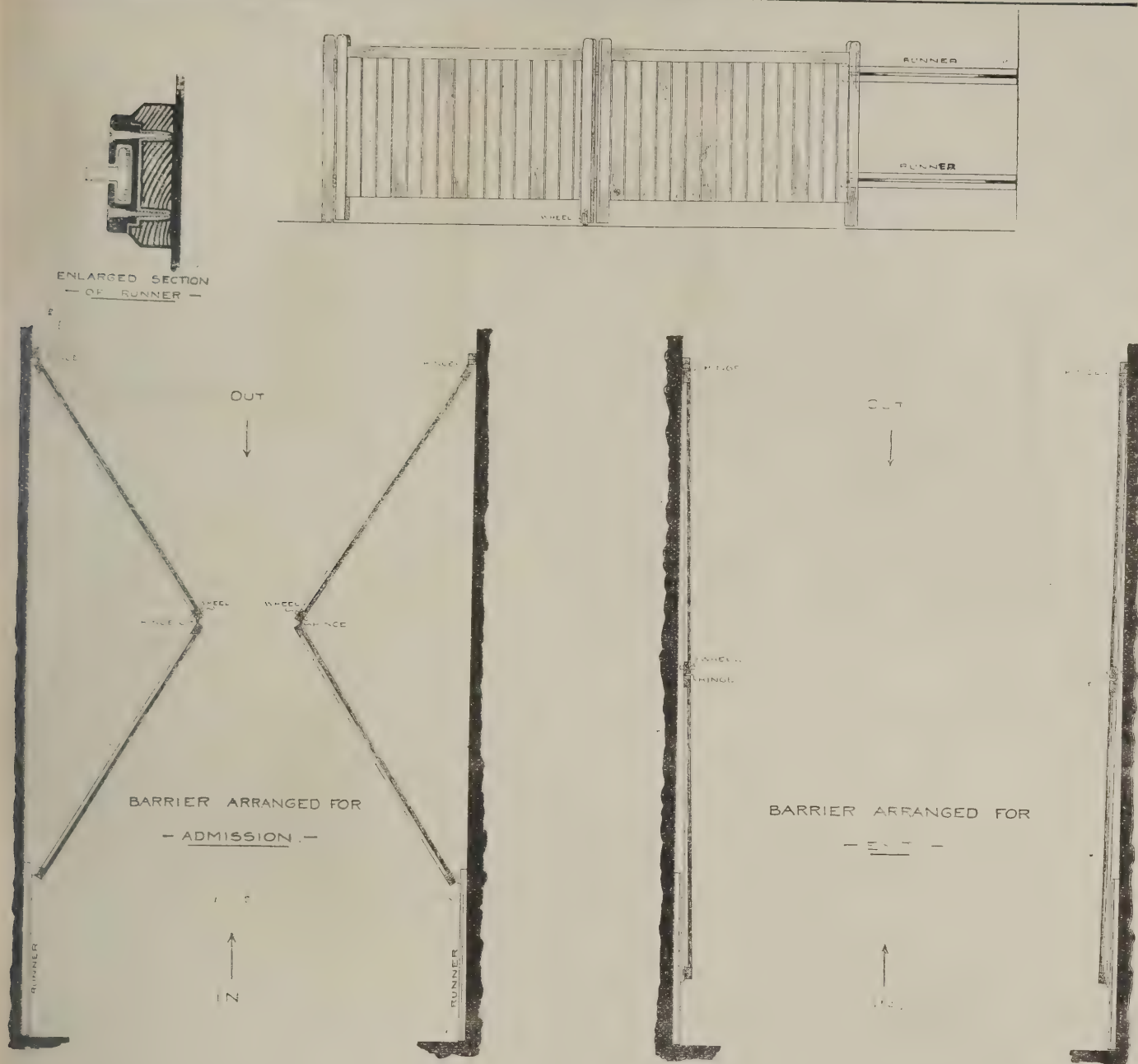


FIG. 4.

open outwards. The twenty-fifth rule of the Council, however, reminds us in the following words that it will not do to open a door outwards into the face of a waiting crowd:—

"All doors used for entrances, and all gates, shall be made to open both ways, and shall, when opened inwards, be locked back against the wall in such a manner as to require a key to release them."

Any one who has experienced, as I have, the opening of a pit door, on a first night in a new provincial theatre, will easily understand the wisdom of this provision; it would be dangerous—indeed, simply impossible—to open a door *into* a crowd. When the door is opened, the above rule provides that it must be secured against the wall, so that it cannot sway about among the crowd.

The pay-box should be a permanent part of the building; temporary and movable arrangements are dangerous, apt, as they are, to be upset by an out-rushing crowd. They obstruct passages and corridors, and diminish the size of the vestibules. It is advisable to place the pay-box as far away as possible from the entrance door, to permit the people, who are waiting admission, to stand under cover in the passages and staircases. It is in the arrangement of such details as pay-boxes, that the architect can provide, for the management, a theatre which can be worked nightly at a reasonable expense. Some theatres, it is well known, are much more profitable to run than others, because their internal arrangements

are such, as to require but few attendants to issue the tickets, collect the checks, and show the audience to their seats. Having this in view, pay-boxes can be so planned as to permit two or more pay-windows to open into two or more entrance passages and staircases; by this means one attendant clerk can collect the money for more than one division of the audience, saving the weekly salary of one man. Especially is this practicable where one section of the audience is admitted a few minutes before the other, for example, so as to get the rush of the gallery over before the rush of the pit commences.

Fig. 6 is the outline of an arrangement whereby two sections of the audience, A and B, can take tickets at one pay-box, but at two windows, P P. The barrier shown at A is as placed for entrance, while at B it is thrown back for exit. Even where the rush is too great for one clerk to attend to both windows, there is still an advantage in having two or more pay-boxes in one, as the acting manager has an easier task in supervising the money-taking department—an important one in a theatrical enterprise. Where possible the pay-boxes should be placed in connection with, or near to, the treasury office, for obvious reasons, this being the centre governing this department.

It has been truly remarked that too frequently the box-office, where the day booking is carried on, has the appearance of being an afterthought, placed as it is in out-of-the-way corners. A vast amount of business is done nowadays in forward booking—so much, indeed, that at some theatres

queue barriers are placed during the day in the vestibules, leading the patrons of the house one by one to the box-keeper, and his model or plan of the numbered seats in the theatre. The box-office should be an office of respectable size, not a dark hole or cupboard, or a wooden structure, resembling a sentinel-box introduced into the vestibule, suggesting that its need was not thought of till a short time before the theatre was opened to the public. Communication by telephone or speaking-tubes, and lift for the conveyance of letters and parcels, should be provided between the box-office and the manager's room. As a rule, this office is the inquiry office of the theatre, and any one having business with the managers first apply to the box-office keeper.

After the people have been admitted, paid their money, and received their checks or tickets, they, before reaching their seats, have to give up their tickets to attendants. This is a matter of management, which as far as the booked parts of the house are concerned need not trouble the architect, a staff of programme attendants usually meeting the demand; but with regard to the cheaper parts of the house the case is different, for any one who "rushed" the pay-box might get a seat without paying, unless a further barrier and attendant stopped their progress. Therefore at the end of the passage-ways, or at the top of the staircases leading into the auditorium, a barrier must be placed, which will allow of only one person passing at a time, and permit the check-taker to collect the tickets that have been pur-

chased at the pay-box. Such a barrier is shewn in Fig. 5.

These barriers should be without fastening, and hung so as to swing outwards back against the walls, where a strong self-locking latch or spring should hold them in position. The pressure of a crowd passing inwards will keep them in position when in use without a fastening. On a staircase they can be made to open against the riser of a step, in a passage against a flap or stop, rising in the floor, which will fall flush with the floor when the barrier folds back against the wall. A similar stop can be provided in the ceiling where barriers are used of a height from floor to ceiling. A bar of the telescope pattern above described is also admissible, or a chain from the well to the barrier, which will be in tension as the crowd press inwards, and fall loose as they pass out.

The check-taker is usually provided with a tall, narrow box, with a slit in the top, into which he drops the tickets as he takes them. This box is locked, and is taken by him after all are admitted into the treasury, where it is unfastened, the tickets counted, and checked against the money handed in by the clerk from the pay-box. Now, it would at first sight seem to be no business of the architect to worry himself about such a trifle as this ticket-collecting box, yet it is a fact that in one of the well-known catastrophes in theatres in this country a staircase was blocked through the fall of a person over one of these boxes—others fell over him, and many deaths were caused by this apparently simple cause. Permanent provision should be made for these boxes; they should not be moveable, but, as in the case in a London theatre, be built flush into the wall.

TWYFORD'S "DELUGE ADAMANT."

MR. T. W. TWYFORD, the well-known sanitary potter of Hanley, Staffordshire, has introduced a wash-down pedestal closet basin, that for solidity and strength has few compeers. The speciality known as the "Deluge Adamant" is made in extra strong Cliffe Vale fireclay, enamelled inside and out, made in one piece, the thinnest part being more than one inch in thickness. It is, therefore, practically unbreakable, and is admirably suited for schools, factories, workhouses, asylums, barracks, and for all places where there is rough usage and where strength and good flushing are required. The basin has an S-trap, and the water surface

basin and trap, the improved flushing arrangements, and the large surface of water, together with the deep-water seal, ought to be sufficient to recommend it to all architects who are specifying closet fittings for public buildings.

DYKE CONSTRUCTION IN HOLLAND.

A VERY instructive account is given of the Holland Dykes in a paper by W. Starling, M. Am. Soc. C. E., in the *Transactions* of that society. The system of modern dyke construction dates back to the 13th and 14th centuries. In 1421 a storm carried away the sea-dykes, destroyed 72 towns and villages, inundated 200,000 acres of land, and drowned half that number of people. This inundation (St. Elizabeth's Flood) gave a new conformation to the Lower Rhine and Maas, and created a great swamp that has since been only partly reclaimed. The writer distinguishes three kinds of dykes—sea-dykes, river-dykes, and internal dykes. The first are built with great strength to stand the shock of heavy seas with a very long slope, one of the best safeguards against heavy breakers. Even a sea-beach slope of 40 or 50 to 1 is given, though it is not practicable to give so flat a slope as this usually. The front of dyke is protected by stone. The dykes for safety sometimes have to be 18 ft. or 20 ft. higher than mean flood. The western shores of the Zuider Zee are less exposed to storms than those of the North Sea, and the dykes are reduced in size accordingly, though even the smaller ones are heavier than required to stand the mere head of water. Some of the first-class dykes, according to Mr. Caland, the Dutch engineer, on the North Sea have steep banks, perpendicular to the direction of the westerly winds, a crown of, at least, 4 metres, a front slope of 10 to 1, a little convex, with the lower portion somewhat steeper, about 6 to 1—protected by heavy stone pitching. Of the second class on inland rivers the crowns are about 3.5 metres, and the front slope 6 to 1. Of those less exposed, the crowns are about 2 to 2.5 metres, and the front slopes of 3 or 4 to 1. All these dykes have a back or land slope of, at least, 2 to 1, an inner berm or banquette of 4 to 10 metres, and another berm somewhat sloping in profile carried up 1 or 2 ft. above flood tide. These dimensions have been increased of late years, according to Mr. Starling, who gives some useful details and sections of the *hoofden* or pile dykes, consisting of two or four rows of piles, pro-

struction, and describes the modes of protection by tarpaulins, the damages to which dykes are exposed, the causes of disaster, leakage through or under the dykes, weak foundations by ice gorges, &c. The plates illustrate outline sections of numerous dykes on the Lek, Waal, Linge, &c.

IRON ARCHES OF LARGE SPAN.—III.

CAST IRON.

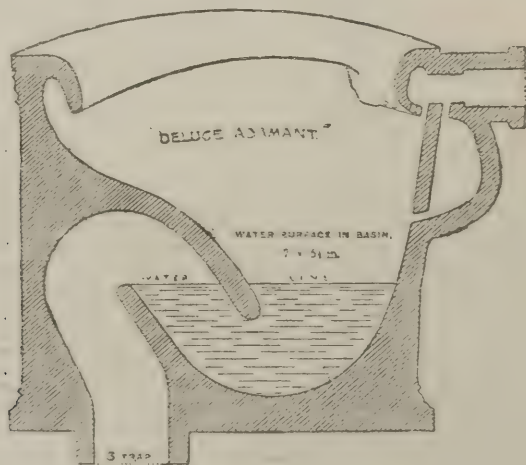
IN the first examples of the employment of cast iron to arched ribs in France, on which subject very little information exists, the engineers there showed a much greater regard for theory than their English *confrères*. Practically, however, their early cross-sections were inferior to those adopted in this country, as an inspection of Figs. 5 and 6 will at once indicate. These figures represent the cross-sections adopted in the cast-iron arched ribs of the Pont du Carrousel, and of a similar structure at Corbeil. It is obvious that both of these sections may be regarded as consisting of two semi-elliptical portions, bolted together at top and bottom, thus forming each an entire elliptically-shaped tube. In a former article on this subject, we drew attention to the great and universally-recognised advantage of the use of cast iron in this particular class of bridge design, inasmuch as it permits of a comparatively large amount of material or mass of metal being concentrated in one thickness, and constituting what may be termed an integral cross-section of rib. This important advantage of employing the material *en masse* is, to a great extent, if not altogether, lost in the sections in Figs. 5 and 6.

It may be put forward against this statement, that, as an arched rib is altogether, or, at least, very nearly so, in compression, the drilling of the holes and the use of bolts for connecting together the two half-sections—for such each really is—does not weaken the form adopted. If the material were wrought iron, and rivets were used instead of bolts, then, on the assumption that the latter completely filled the holes, and that the iron was only subjected to strains of compression, the argument might hold. It has been found that, where pins have been substituted for rivets in railway bridges, the incessant jar and vibration caused by heavy passing trains, ultimately causes them to loosen. The Cramlin Viaduct, which has spans of 150 ft.—a very moderate dimension for a structure of wrought iron—became so "shaky" under similar conditions, that rivets and gusset pieces, and other measures had to be resorted to, in order to place the bridge in a state of security. Whatever doubt may exist in either of the two instances alluded to, we do not think that any can exist with respect to the two-halved sections under consideration. If the arched rib is called upon, as some authorities assert, to act as an ordinary girder under transverse strain, the bolts would unquestionably be liable to a shearing stress, and their area and strength must be adapted to resist it. It should be mentioned here, in fairness, that the employment of this particular design of arched ribs may have resulted from necessity, and not from choice. The capabilities of the French foundries at the time these castings were made may not have been equal to turning out such large masses of metal in one solid piece. The depth of each cross-section in Figs. 5 and 6 is 3.3 ft., and in these days would probably have been considered a "large" casting.

A consideration of the "moment of inertia" of the two elliptical cross-sections, as well as of the manner in which the material is generally distributed, will corroborate our opening statement in the present article. Neither of the sections have any breadth in the form of flanges any more than the plank-on-edge example alluded to in Article I., but in the present instance the absence of any value for b is, to some extent, compensated for by the removal of the material from the central vertical axis of the figure, and concentrating it at the sides of the tube. If we make T the semi-transverse axis, and C the semi-conjugate axis, and I the moment of inertia, as before, we obtain

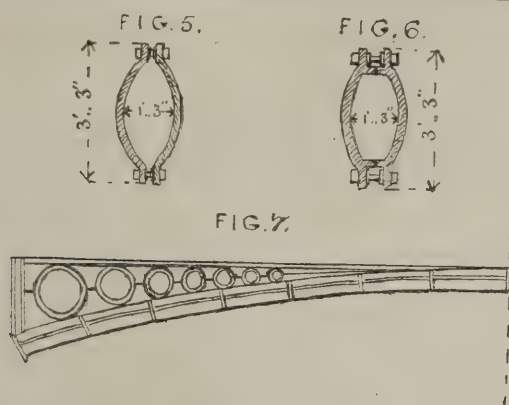
$$I = \pi \times C T^3. \text{ Should } C = T \text{ then } I = \frac{\pi T^4}{4},$$

which is its value for a circular section when $T = R$, the form into which the elliptical section would become converted under those conditions. The other limit of C will be $C = 0$, in which case the value for I also equals zero; but



in basin is 7 in. by 5 in. The section of this combination-trap and basin is well adapted to insure self-cleaning, as there are no angles in any part. The basin has a spherical bottom, forming part of the siphon, and the inlet and upper lip insure a good flush. The price for closet, yellow enamelled outside and white inside is 36s., and the basin can be fitted with a 3-gallon national siphon cistern painted or galvanized. This pedestal form has many advantages over the old style of closet, as it can be made ornamental, can be kept clean, and is free from all casings of wood which harbour dust and dirt. Twyford's "Deluge Combined Washdown Pedestal," with earthenware or lead trap, S or P-shaped, fitted with or without slop-top, is another form of sanitary closet worth notice. The formation of

jecting 6 ft. or so, driven about 6 in. or 8 in. apart, between which on each side of the rows is a carefully laid bed of clay, brush, and stone, the latter about 2 ft. square. The sea slope is about 23 to 1, the steeper slope being next the shore. The rows of piles are strengthened by waling pieces on both sides, and the *hoofd* is divided into sections by cross piles and heavy horizontal ties. The straw mat or *krammat*, consists of a thin layer of carefully-selected straw, cramped by ties or binders of the same material, placed at short intervals, and pressed into the earth by a two-pronged fork. Its use is to form a kind of footing to keep the heavier material, bricks, &c., from sinking deeply and irregularly. Often this matting decays; the slopes are firm, dry, and hard. The author mentions other forms of con-



if instead of reaching the actual vanishing limit of the semi-conjugate axis, we make C very small, then the sides of the sections tend to approach each other, and we revert to the form shown in Fig. 1, which was the original cross section for cast-iron arched ribs in this country. The total absence of any value for " b " in the rib in Fig. 5, was evidently considered a defect by French engineers, as in the subsequent example in Fig. 6 it was endeavoured to be remedied, although to a very trifling degree, by the modification shown in the upper and lower portions of the cross section. Had the tubes been cast in one piece, the alteration might have been attended with some corresponding advantage; but as the width at these points does not exceed 4in., and the tube is divided into vertical segments at the centre of the width, the enlarged portions are in themselves devoid of continuity, and therefore fulfil properly the functions neither of a flange nor top and bottom of the tubular section. Longer distance pieces require to be inserted between the "ears" or "lugs" of the rib, so that it is very questionable whether, practically, the arrangement in Fig. 6 is any improvement upon that adopted in Fig. 5, in which the two halves of the section are "coupled up" in a firmer and more compact manner. Both these forms of cast-iron arched ribs are stiffer than those we have brought under review; or perhaps it would be more correct to say that they would be stiffer if they were integral sections, and were not obliged to rely upon bolts and nuts for a great part of their resistance and stability.

The general features of the half-elevation of one of the ribs of the "Pont du Carrousel" are shown in Fig. 7. The span is 160ft., and the arch is segmental in form, struck from a radius of 325ft. Putting R for the radius, C for the semi-chord, and V for the rise or versed sine, the value of V is easily obtained by solving the equation $V^2 - 2RV = -C^2$, and will be found equal to 10ft. It may be mentioned here that a cast-iron arch bridge, of very nearly the same span as that described, was built at St. Petersburg over the tideless river Neva nearly sixty years ago. This bridge consists of seven arches, of which the centre one is built in eleven segments, and has a span of 156ft. Although the dimensions of the relative spans of the two structures are approximately identical, the resemblance does not extend to their respective "rises." The value for V in the Russian example is 14'3in., or nearly 50 per cent. more than in the case of the French bridge. By increasing the radius the arch becomes "flatter," and more headway can in this manner be obtained at and near the springings; but this advantage is gained at the cost of an increased horizontal thrust against the abutments. Where additional or extra headway is required beyond what is afforded by a properly proportioned segmental arch, it is preferable to adopt an elliptical or parabolic profile. The ellipse, however, under all conditions, gives more headway at these particular points than the parabola. Westminster Bridge, the arches of which are, in the central part, of wrought iron, and of cast at the haunches or springings, is a fine illustration of this especial curvilinear contour. It may, nevertheless, be stated that there are practical objections to this felicitous combination of cast and wrought iron in one and the same design.

There is one element in the half-arch in Fig. 7 which deserves attention in all similar structures, as it is of considerable importance, and may affect, to some extent, the actual nature of the

stresses brought to bear upon the rib itself. We allude to the shape adopted for the spandrels, which generally may be classed under one of three classes. They may be continuous, like the web of a plate girder; diagonal and open, similar to a lattice-girder web; or vertical and insistent. In the last instance they resemble the vertical suspending rods of a suspension bridge with the tension stresses changed to others of compression. The spandrels in Fig. 7 are composed of circular rings, and on the supposition that they touched the rib and the upper horizontal stringer only in one point, they would practically belong to the third or last class. In defending the design, the author commented upon the advantage accruing from the use of this particular form of spandrel, inasmuch as they deflected slightly under a passing load, and so transmitted it to the rib without any impactive force or jar. No doubt they may sometimes act in this satisfactory manner; but as a matter of fact, they are far more liable to break, and so cause the destruction of the arch. Instances of such fractures are on record; but we must reserve for another article further information and existing examples relating to this interesting and instructive detail of cast-iron arch buildings.

OBITUARY.

HERR GEORGE BLEIBTREU, the celebrated German battle painter, died at Berlin on Sunday, aged 65. He was born at Xanten in 1828, commenced his art studies at Dusseldorf Academy at the age of 15, and subsequently worked under Theodor Hildebrandt. On the outbreak of the Franco-Prussian War of 1870-71, Herr Bleibtreu accompanied the headquarters staff of the then Crown Prince of Prussia at his Royal Highness's special invitation, and accompanied the German forces to Versailles, where he established a studio. It was here that he painted many works representing incidents in the war.

At the Sheffield Police-court on Monday, Walter Gosling, builder, was summoned for not obtaining the necessary permission from the borough surveyor to fix up hoardings where he was erecting houses in Woodburn-road, Attercliffe. Through not having fixed up some hoardings a young woman fell into the cellar of one of the houses, and sustained serious injuries. He was fined £2.

The parish church of Weston, near Bath, has been enlarged at an expense of about £4,000, by the building of a north transept, a south transept, and an extension of the east end. The whole of the church is to be reset. Mr. Harbottle, of Exeter, is the architect, and Messrs. Stevens and Bastow, of Bristol, the contractors. The cornerstone of the new work was laid on Tuesday, by Mrs. Frazer, widow of the Bishop of Manchester.

Two new chapels of the monastic church at Downside, near Bath, have been opened. They are situated in the north aisle of the chancel, and adjoin the chapel of the Holy Angels. The one next to that chapel is dedicated to St. Placid. The details of the reredos have been copied from paneling in Selby Abbey, and those of the altar from arcading in Canterbury Cathedral. The carving is by Mr. Wall, of Cheltenham. The window represents scenes from the life of St. Placid, and has been designed and executed by Messrs. Hardman, of Birmingham. The glass of the second chapel, the chapel of the Seven Dolours, is also from the same firm. The flooring of both chapels is the work of the Rust Mosaic Company, of Bristol, and is from designs by Messrs. Dunn and Hansom, the architects of the church.

COMPETITIONS.

BRAMLEY, NEAR LEEDS.—In the limited competition for the new Liberal Club at Bramley the designs of Messrs. Jowett Kendall and J. Harper Bakes, M.S.A., architects, of Leeds and Idle, have been accepted by the directors.

INFECTIOUS HOSPITAL, KEIGHLEY.—Thirty sets of drawings were sent in for the above competition, and the approved and accepted plans were submitted under motto "Isolation" (No. 2), by Messrs. Judson and Moore, Keighley and Bradford. The first premium has been awarded to the plans under motto "Progress," by Messrs. Marshall and Dick, 13, Grey-street, Newcastle-on-Tyne; the second premium to Mr. W. de Lacy Ahern, C.E., 55, Colmore-row, Birmingham, under motto "Ab Wortha."

CHIPS.

A new pier for Weston-super-Mare has been resolved upon, and the necessary Parliamentary powers will be applied for. The structure will be longer than the well-known one at Southend, being 2,200yds. in length and 16ft. wide, whilst the pier-head will be 160ft. by 50ft. On the pier will be formed twelve shelters, and concert-rooms will be erected at the pier-head.

Good progress is being made with the works for a supply of water to Oundle, now being carried out by the local board of that town. Mr. Radford is the engineer, Messrs. Siddons and Freeman are the general contractors, and Messrs. Cochrane and Co., of Dudley, are supplying the pipes.

Last week the foundation-stones were laid of a Congregational church in Pearl-street, Saltburn-by-the-Sea, in the presence of a large company. The building is to be in the 14th century style, with a tower and turret in Pearl-street, and will have seating accommodation for 303 persons. Mr. Caleb Petch, of Scarborough, is the architect, and the cost will be £1,400.

A new branch bank was opened at Grantham last week. The contractors were Messrs. Herbert, of Leicester.

The Salford Corporation having been asked whether it is willing to advance a sum of money to the Manchester Ship Canal Company towards the cost of completing the canal, the council determined on Wednesday to view with favour a proposal to advance the company £1,000,000, provided the council secure adequate representation on the directorate, and are able to raise a loan on favourable terms.

The death occurred last week, at Hereford, of Mr. William Bowers, a prominent builder and contractor in that city, who died from pulmonary disease at the age of 63 years.

Mr. James Reckitt has offered to present to Hall a library, valued at £5,000, and an income of £300 per annum, contingent upon the town adopting the Free Libraries Act.

Workmen are at present engaged near the Stephenson Monument, Newcastle-on-Tyne, preparing the way for a drinking-fountain which will shortly be erected on that spot. The fountain is to be erected by the trustees of the late Mrs. Burn, a daughter of Newcastle's great builder, the late Richard Grainger, the site having been granted by the Town Improvement Committee for the purpose. Constructed of grey and red granite, the fountain will have four faces, and in addition to the usual drinking cups there will be drinking troughs. The erection, which will be about 9ft. high, is of the dome type, and is crowned with a finial. The work is to be carried out by the Elswick Court Marble Works Company, Northumberland-street, Newcastle.

The memorial stone of a new Congregational church and Sunday-school at Staple-hill, Bristol, was laid on Wednesday. Plans for the church and schools have been prepared by Mr. Frank Wills, of Bristol, and the estimated cost of the scheme in its entirety will be £4,000; but it is proposed for the present to erect school premises only, consisting of a large hall, seating about 300 persons, a room for infants, and six classrooms. The estimated cost of this section of the scheme is £1,600.

The first ordinary meeting of the Session 1892-93 of the Surveyors' Institution will be held on Monday, Nov. 14, when the president, Mr. Charles J. Shoppee, will deliver an opening address.

The Derbyshire County Council have authorised a committee to take legal proceedings against the corporations of Derby and Burton-on-Trent, to compel them to cease polluting the rivers Derwent and Trent respectively. Burton has a sewage farm; but it is alleged that the sewage runs from it into the Trent. The Derby sewage is turned direct into the Derwent.

WAYSIDE NOTES.

I HAVE seen the great work, but as yet have had no time to peruse its contents. It is, I am informed, partly a re-hash of old letters to the *Times*, contributed by the authors who entered the list of combatants in the recent Quixotic tournament among architects that took place in the columns of that journal. If this is really so, it is to be regretted. The generally neat and modest exterior of the book leads one to the conclusion that the contents are fresh and original. "Here," thought I, "is a book for a nook, with the comfortable adjuncts of pipe, slippers, and winter fireside." Warmed-up dishes, however, are not to my taste, either of palate or intellect. Neither do we incline to a great number and variety of courses, and would have preferred Mr. Norman Shaw or Mr. Jackson to the end of the chapter, in place of a hotch-potch of miscellaneous opinions.

In the immediate future I shall hope to read the book. It is rather a pity that among the writers of the thirteen essays not enough ingenuity was forthcoming to invent a more suitable title than this old, threadbare, double-faced, disingenuous one: "Architecture—a Profession or an Art?" Most of us are well sick of the sight of it, and had hoped that it was comfortably dead and buried long ago. Apparently the only straightforward thing about it is the certain indication of the re-hash aforementioned.

I see I was in error as to the order of precedence of "art" and "profession" in the title adopted when writing last week. From the point of view of the writers, the order observed is the most suitable, and avoids an awkwardness of sound that otherwise occurs. There was also, by the bye, a printer's error in my first note last week. "Compared with the correctness of the workers" should have been "compared with the earnestness of the workers." Mr. Ruskin's argument was that laws of composition are mere vanity if the building is erected with a machine-like indifference to the work done—an undeniable position.

I suppose that now that the question of examination *v.* non-examination—for this, after all, is the essence of the matter—is to come to the front again, we shall have more washing of professional "dirty linen" in the columns of the public Press—things hateful to contemplate. We had enough of it before, goodness knows! All the possible—and impossible—faults of the architect, whether on the side of examination or of non-examination, were drawn in glowing pictures with apparent delight in the task. Anything less to the credit of any profession—or art, I beg pardon—whether divinity, law, medicine, or otherwise, it is not possible to conceive. If this is all coming over again, then, in my small way, I beg to remain on neutral ground. Time was when architecture and culture and refinement were substantives bearing due relation one to the other. What has come to pass during the last few years may have modified this. I do not assert, but put forward the suggestion. At such a time we may well think the more highly of those architects—elderly men for the most part—who have withheld from the wrangle in the public arena, and who have won, and continue to win and hold, the esteem and regard of patrons of architecture, even though they lack the cleverness of the smart school of design and the presumption of modern, acrobatic draughtsmanship.

Those who follow the doings of the British School at Athens will be interested in its annual report just issued. A special appeal for funds to continue the excavations at Megalopolis is made. The sum of £300—little enough for undertakings of this nature—is required to complete works commenced and to clear out the Thersillion—a building of much interest. A full report of discoveries so far made is to be issued by the Hellenic Society. The Thersillion will be known to classical readers, who may remember the allusion made by Pausanias to the building, as a council-house, taking its name from its founder. The place is described as being "an enormous rectangular hall, whose floor sloped from the centre to the sides, and whose roof was supported by row after row of columns in a very peculiar disposition, radiating from the centre as well as parallel to the sides." Mr. Ernest Gardner, the

director of the school, says that the difficulty attending the discovery at Megalopolis partly results from a complicated relationship between the theatre and the Thersillion, the great portico between the two buildings serving, in a peculiar manner, as an integral part of both buildings. The full report of the Hellenic Society will be anticipated with much interest by enthusiastic archaeologists. The hon. treasurer of the British School at Athens is Mr. Walter Leaf, of Old Change, who will receive any subscriptions to the works of excavation.

Colonel Hughes' allusion to the School Board at Tuesday's meeting of the County Council can scarcely be said to have been happy. There has been bad building, certainly; but the evil came about rather because the officials of the Board neglected their duties or were expected to do more than they could accomplish in the way of overseeing, than because the Board put the work out to contract. Private architects manage easily enough to get work done by contract as satisfactorily as possible, and why cannot school boards and county councils? Now, the County Council intend to try their hands at being master-builders. The Council propose to build some artisans' dwellings, rendered necessary by the clearances for the Blackwall Tunnel, and, in spite of many antagonistic opinions, have practically resolved to do without any contractor, and trust to their own officials and such others as, it is presumed, they will temporarily engage, to get the building erected. The avowed object is the saving of money. Whether this end will be served is very doubtful. It may be very good to do away with contracts for artistic and architectural motives; but an inexperienced Council is not much to pitch against a contractor whose whole training and experience tend to and facilitate economical working expenses, and whose wisdom is chiefly the knowledge of cheap markets. The County Council puts too many irons in the fire at one time. At any rate, they might openly avow that interest in the working classes induces them to take certain views; when, the benefiting of working men being uppermost, and the protection from "sweating" paramount, we might fall into ideas similar to those of the good Councillors.

I hear that the building now just commencing on a site next Sion College on the Thames Embankment is to be *sui generis*. Report has it that the work is in Mr. Pearson's hands; that the owners are from across the Atlantic; and that the instructions have been to "crowd on all sail," to use a figurative expression—in other words, the architect may spend any money to produce his effects. Jacobean is in the air as the style, and untold granite glories are to be a feature.

The remains of Her Majesty's Theatre, as I saw them a few days ago, have something of the massiveness of a Roman ruin. The vast thickness of walls, the great openings of proscenium arch, &c., and the nature of the material—brickwork of the simplest order—all help the effect. The theatre appears almost vaster in its dismantled, wrecked state, than when densely packed with people, and with all its hangings and decorations. It looked big enough then.

Except in case of a leak caused by knocking a hole in the side of a vessel or other unforeseen occurrence, steamships of to-day ought to be proof against their fires being drowned out. There is something more than usually tragic and impressive in the end of the P. and O. steamer *Bokhara*. The non-nautical mind can scarcely grasp the full significance of the telegraphic despatch: "The sea ran mountains high, repeatedly sweeping the decks, and finally extinguishing the engine-room fires." The *Bokhara* was built on the Clyde in '73; but I should imagine that ships can be so designed and constructed at the present day that it would be practically impossible for any seas sweeping their decks to penetrate in sufficient quantity to cause any serious danger in the stoke-holes. The prevention of a disaster such as that which overtook the ill-fated ship in the China seas, would, one would think, be the first care of naval architects.

GOTH.

The name of Charles Richard Gurr, of Maygrove-road, West Hampstead, builder, appears in Tuesday's list of adjudications in bankruptcy.

Engineering Notes.

RAILWAY WIDENINGS NEAR BICKLEY.—Since the opening of their new route via Catford and Peckham from Bickley to St. Paul's, the London, Chatham, and Dover Company have commenced an extension of their railway lines at Shortlands and Bickley. Commencing at Shortlands Junction, and running as far as the bridge over the line at Woodlands-road, Bickley, a distance of 2 miles 133 chains, a double pair of lines is to be laid, along which the local passenger traffic will be carried. Messrs. Lucas and Aird, the contractors, have begun the work of laying the rails, and the relative changes in the railway system which this measure entails. Foremost among these are the building of new railway stations at Shortlands, Bromley, and Bickley. At Shortlands the present station-house will be demolished, and a new structure will be put up. The present bridge will be widened from 25ft. to 40ft., and will be constructed of iron girders resting on massive brick abutments. A subway will be taken through under the railway, 82ft. from the old bridge, leading to two island platforms. On the outer lines will be the up and down local trains, while the present lines will be utilised for through traffic. From the bridge there will run for 800ft. a heavy retaining wall towards Queen's Mead. At Bromley again the station will be shifted up on to the present bridge, which will be widened as to admit of a courtyard, and a new goods yard will be constructed. All along the route of the extension the line will be widened, additions being made to culverts, bridges, and cuttings. Bickley station will be treated in similar fashion to Bromley station. These works, which are estimated to cost at least half a million sterling, will be completed in ten months.

HIGHLAND RAILWAY EXTENSION.—The directors of the Highland Railway Company have received tenders for the construction of the last section of the through line from Inverness to Aviemore. This contract extends from the ticket platform at Millburn, near Inverness, through the estate and battlefield of Culloden, and over the river Nairn by a viaduct of 570yds. in length and from 58ft. to 129ft. in height. The successful offerer was Mr. John Mackay, the contractor for the Thurso Harbour extension works, who has already made several portions of the Highland line between Forres and Perth. The contract price for the new works is £117,925, the company, in addition, providing the permanent way material and fencing. The directors also accepted the offer of Mr. George Pirie, who has just completed the Burghhead and Hopeman extension, for the construction of the new branch to Fochabers. The amount of the contract is £8,960. The directors also resolved to ask Parliament in the ensuing session for powers to extend the present Dingwall and Skye line from the present terminus at Strone Ferry to Kyleakin, a distance of some ten miles.

MATLOCK.—The cable tramway, which is to facilitate communication up the precipitous hill between Matlock Bridge and Matlock Bank, has just been completed, when the consulting engineer made his inspection, and a trial car was run. The undertaking has been promoted by Mr. George Newnes, M.P., and the capital employed amounted to £20,000. Not only is the hill precipitous, by reason of which the gradient is 1 in 7 in Rutland-street, and varying lower from 1 in 7 to 1 in 15, but there are numerous curves. The route starts at the Crown-square, at the Bridge, and passing up Bank-road, crosses Smedley-street, and so on through Rutland-street to the tramway terminus, near Wellington-street, attaining in its half-mile course an elevation of 600ft. above the valley of the river Derwent. The terminal buildings have cost about £3,000, the contractors being Messrs. Knowles and Sons, of Matlock Bank. The laying of the tramway was let to Messrs. Dick, Kerr, and Co., of London. The work was commenced in April last, and it has been carried out under the direction of Mr. Croydon Marks, C.E., of Birmingham, at a cost of about £10,000.

The Dorset-gardens Wesleyan Chapel, Brighton, was reopened last Sunday after undergoing the process of extensive works of decoration, and formation of increased means of egress and of ventilation, and the electric light installation, the whole from the designs and under the superintendence of Mr. Arthur Loader, architect, of Brighton.

CONTENTS.

St. Mary's Hospital—Clarence Wing Competition ...	551
The Licensing Sessions of the London County Council ...	552
Beginning at the Wrong End ...	553
Architecture: a Profession or an Art ...	554
Architectural Antiquities of the Isle of Wight ...	555
Road and Footway Blocks ...	555
The London County Council as their own Contractors ...	555
Theatres.—X ...	555
Twynford's "Deluge Adamant" ...	555
Dyke Construction in Holland ...	558
Iron Arches of Large Span.—III. ...	558
Obituary ...	559
Competitions ...	559
Wayside Notes ...	559
Engineering Notes ...	560
Our Illustrations ...	560
Architectural and Archaeological Societies ...	561
Statues, Memorials, &c. ...	561
Water Supply and Sanitary Matters ...	580
Stained Glass ...	581
The Building News Directory ...	581
Building Intelligence ...	581
Correspondence ...	582
Intercommunication ...	583
Legal ...	584
Legal Intelligence ...	584
Our Office Table ...	585
Trade News ...	585
Tenders ...	585

ILLUSTRATIONS.

ALL SOULS' CHAPEL, INVERGOWRIE, N.B.—TUBINGEN, WÜRTTEMBERG.—HIGHER GRADE SCHOOLS AT CHEETHAM.—BUSINESS PREMISES, CHESTER.—INTERIOR DECORATION, BY W. HENSMAN.—NORTH COURT.—MAUSOLEUM AT SEATON DELAVAL HALL, NORTHUMBERLAND.

Our Illustrations.

ALL SOULS' CHAPEL, INVERGOWRIE.

This chapel is being erected by Lady Frances Kinnaird as a memorial to the late Lord Kinnaird. It is built of Corsehill stone, the interior being likewise stone-faced. The roof is of open timber construction, covered with pale grey Westmorland slates. The spire, carried over the intersection of nave and transepts, is entirely of stone, and reaches a total height of 140ft. Mr. Hippolyte J. Blanc, A.R.S.A., is the architect.

THE MARKET-PLACE, TUBINGEN.

TUBINGEN is the university town of Württemberg. The old town-hall, of which we publish this week a sketch by Mr. Seth-Smith, forms one side of the "platz," generally described in the guide-books as part of "the irregularly built and unattractive old town," the fact being that outside this now limited area there is nothing worthy of a sketch; but within it many a boldly picturesque feature—such as the gateway to the castle, or a great dormer window of several stories in height—which compels one to sit down and study it. This "platz" is quaint and interesting, with every building in it set at a different angle, but producing a *tout-ensemble* extraordinarily picturesque.

CITY OF MANCHESTER SCHOOL BOARD—HIGHER GRADE SCHOOL, CHEETHAM.

This design was recently selected in competition; it is intended to be a mixed school for 500 boys and girls, and will be erected in Heath-place, Cheetham Hill, Manchester. The basement contains cellars for coal, wood, gas and water meters, kitchen, boiler, &c. On the ground floor is a gymnasium, 65ft. by 32ft. 6in.; two cloak rooms, manual instruction-room, 49ft. by 32ft.; a store-room, teachers' room, and two covered playgrounds, all with a clear height of 15ft. The first floor contains boys' and girls' (mixed) department—viz., six class-rooms, each 25ft. by 25ft.; two class-rooms, each 27ft. 6in. by 25ft. 6in.; master's room, with ante-room; also a teachers' room, with store-room and two cloak-rooms, the above (excepting teachers' room) to be 15ft. high in the clear. The second floor is divided into cookery-room, two science-rooms, each 25ft. by 25ft.; a chemical laboratory, 61ft. by 24ft. 6in.; balance-room, store-room, the whole having an average height of 17ft. On this floor is arranged an excellent drawing-room, 66ft. by 25ft. 6in., average height 19ft., with two good cloak-room and a teachers' room. This art school has a good north light. Care has been taken to provide good entrances and staircases, the girls entering at the eastern and the boys at the western end of the building. The ground-

floor corridors lead direct to the gymnasium and playgrounds. An auxiliary staircase is provided at the rear of the building, providing access from the playgrounds to the upper floor and to each department; this will be found serviceable in emergencies. There are two open playgrounds and two covered playgrounds for boys and girls respectively. The usual offices are provided. The entire school will be warmed by large, open fireplaces of the best pattern. Ventilation by hopper sheets and extraction flues is provided throughout, special chambers, &c., being arranged for the chemical laboratory. Internally, the walls of the ground floor will be pointed and dis-tempered. On the upper floors glazed tile dados, 4ft. high and with with plastering over, will be used. The staircase walls will be lined with glazed bricks, with suitable dados. Generally, the building will be of common brickwork, with stock dressings; the masonry will be of Rain-hill stone, with landings, &c., of Yorkshire stone from Greenmoor quarries. Wood-block flooring will be laid on concrete beds in some portions and pitch-pine flooring boards in others. Playground floors will be concreted. The roof timbers will be of red deal. Internal joiners' work of pitch-pine, and the roofs covered with Welsh slates, with Ruabon ridge tiles, &c. The style adopted is Flemish, of a Gothic type. The architects are Messrs. Royle and Bennett, of 17, Cooper-street, Manchester.

BUSINESS PREMISES, EASTGATE-STREET, CHESTER.

THESE premises are being built for Messrs. Dicksons, the well-known seed merchants and nurserymen. The architect has adopted the half-timber style of architecture, which is characteristic of the city, the woodwork being of oak, supported upon moulded piers and elliptical arches of polished red Aberdeen granite, which, on account of its durability, the architect considers a favourable innovation to the local freestone generally used. The building is of fireproof construction, the ironwork and floors being supplied by Messrs. Homan and Rodgers, of London and Manchester, and the whole of the work is being carried out by Mr. William Parrott, builder, from the plans and under the superintendence of Mr. C. A. Ewing, architect, both of Chester. Messrs. Whitehead and Sons, of Aberdeen, supplied the granite work.

INTERIOR DECORATION.

A DARK grey-green pattern, outlined with pale red on a golden ground, with blues, white, orange, and black in small portions, forms the filling of the wall spaces. The frieze consists of similar colours, but more numerous and varied. The ceiling depends for its effect entirely upon the decoration, being flat, and without any visible constructional features. A general warm tone, blue and yellow stars, dark grey and yellow corners to the octagons, and warm and dark grey, with yellows and broken orange tones, in the long panels, form the scheme of colour; the whole being paler in tone than the walls. The dado is very simply treated with light and dark tones of grey, with the mouldings here and there of the colours used in the filling over. The work was designed by Mr. Walter Hensman.

ARCHITECTURAL ANTIQUITIES OF THE ISLE OF WIGHT.

(See description on page 555.)

MAUSOLEUM AT SEATON DELAVAL HALL, NORTHUMBERLAND.

THIS mausoleum, an illustration of which appears on another page, is situated in the park at Seaton Delaval, not far from the Hall, which was built in 1707 for Admiral Delaval by Sir John Vanbrugh, the architect of Blenheim. It was erected by Sir John and Lady Hussey Delaval to their only son John, who died in 1775. It is covered by a leaden cupola, and approached through a Doric portico, each column of which is formed of a single stone. The interior is in the form of a chapel having a nave in the middle, with an altar or communion-table. Above this is a dome supported by semi-circular arches, and beneath are vaults. The mausoleum, however, has never been used for the purpose originally intended.—J. BRYSON RENTON.

New voluntary schools in Lock-lane, Allerton, Bywater, were opened by the Bishop of Ripon on Friday. The cost has been £1,500, and Mr. R. McDonald was the architect.

ARCHITECTURAL & ARCHAEOLOGICAL SOCIETIES.

SOCIETY OF ARCHITECTS.—The members' dinner of the Society of Architects will be held this year on November 15, at the Holborn Restaurant, at 7.30 p.m. Mr. Robert Walker, the President, will take the chair.

PRESTON MASTER BUILDERS' ASSOCIATION.—The third annual meeting of this association was held at the Castle Hotel, on Thursday evening in last week, the president, Mr. John Walmsley, in the chair. The secretary, Mr. John Tomlison, read the report for the past half-year, which stated that the number of firms on the books was 53, a membership which compared very favourably with any local association in the country. The death of Mr. Robert Park, vice-president, was referred to. The committee reported that the contract form adopted by the association was becoming more generally used. On the motion of Mr. R. Croasdale, seconded by Mr. Dewhurst, the report was adopted. Mr. John Walmsley was re-elected president, Mr. C. Walker, vice-president, and T. H. Kellett was elected a vice-president in the place of the late Mr. Park. Mr. R. Croasdale (hon. treasurer), and Messrs. Cottam and J. Cartmell (hon. auditors) were re-elected for the ensuing year.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The inaugural meeting of the session 1892-3 of this society was held at the Cutlers' Hall, Sheffield, on the 11th inst. A large number of members attended. The President, Mr. C. J. Innocent, delivered an inaugural address, in the course of which he congratulated the society on the satisfactory financial position in which it found itself, having a balance in hand. Referring to the proposed commencement of a class for the study by younger members of art, he mentioned that the idea was suggested by himself at last year's meeting. The idea was taken up by Mr. Gibbs, who read a paper on "Architectural Education in Sheffield." Mr. Gibbs was then requested to prepare a scheme. This had since been under the consideration of the council. This summer the younger members had been invited to form sketching parties, and many of them had visited the churches and halls in the surrounding district on Saturday afternoons. The scheme had worked very well. Arrangements had been made for a class during the coming winter, to be held at the school of art, and in direct connection with the society. At the close of Mr. Innocent's address, a discussion was taken part in by Messrs. Macdougall, Hadfield, J. B. Mitchell-Withers, and E. M. Gibbs. Afterwards a programme of song was gone through, with Mr. J. A. Podgers as accompanist, and the proceedings concluded with a form of conversation and a walk through the rooms devoted to the exhibits of the Society of Artists.

CHIPS.

The ceremony of laying the foundation-stone of the new Sunday schools and parish room for St. Mary Steps, Exeter, took place on the 13th inst. Mr. E. G. Warren is the hon. architect, and the contractor Mr. G. L. Stile, whose tender was accepted at £787. The large room is 54ft. by 26ft. in the clear, and will afford accommodation for 180 scholars. The class-rooms will be formed by means of revolving shutters. The building is being constructed of red brick.

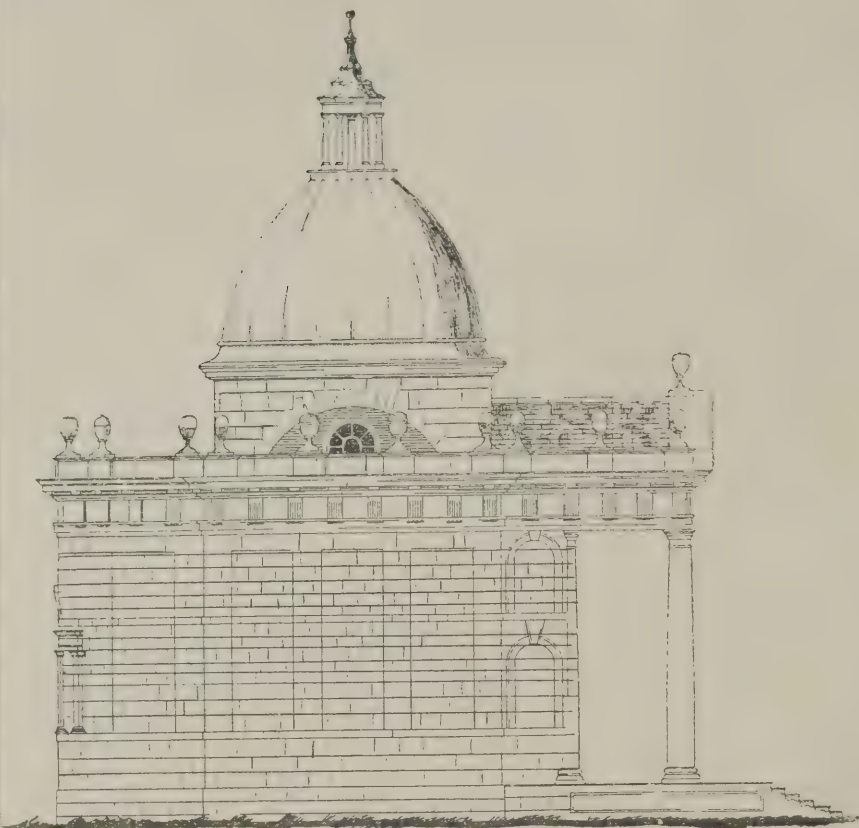
The will of Mr. John William Grover, M.Inst.C.E., F.S.A., late of 15, Victoria-street, Westminster, and Chase Lodge, Clapham Common, who died on August 23, has been proved, the value of the personal estate exceeding £40,000.

Windsor-place U.P. church, Portobello, N.B., which was erected a dozen years since, was reopened on Sunday after the completion of internal decorations carried out by Mr. D. J. Tough, of Edinburgh.

The Lincolnshire County Council considered at their last meeting 46 applications for the offices of district surveyor as proposed to be appointed—one for North Holland and the other for South—under the new scheme resolved upon for the maintenance of new roads. Mr. Lewis Starkie, till now surveyor to the local board of Rothwell, near Leeds, was appointed for North Holland division, and Mr. J. W. Shaw, district surveyor to the Norfolk County Council, was appointed for South Holland. The value of the offices is £150 a year each.

The ratepayers of Colwyn Bay have decided to purchase, at a cost of £8,000, 42 acres of the magnificent Pwlycrochan Woods, to be free to the public for ever.

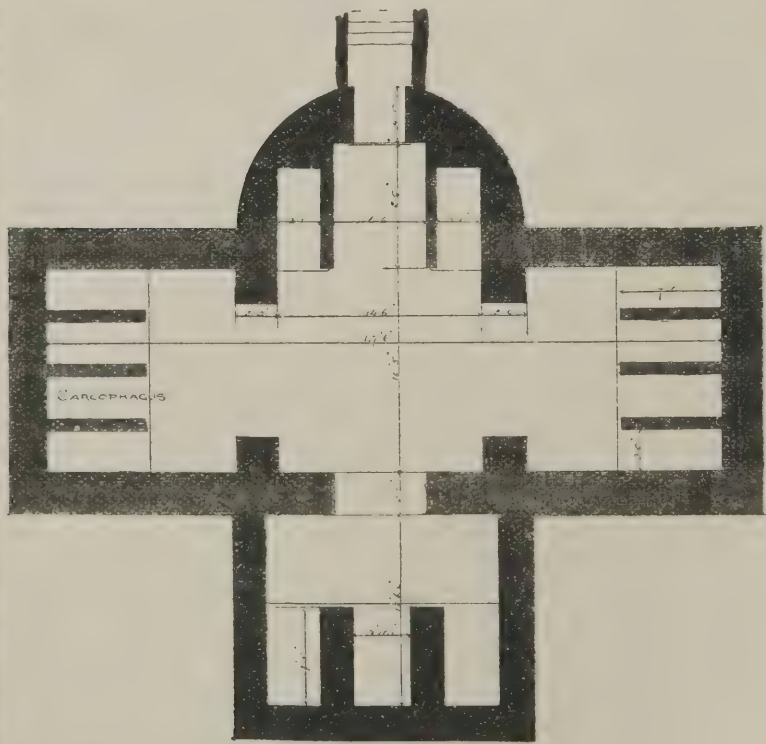
MAUSOLEUM AT SEATON DELAWARE



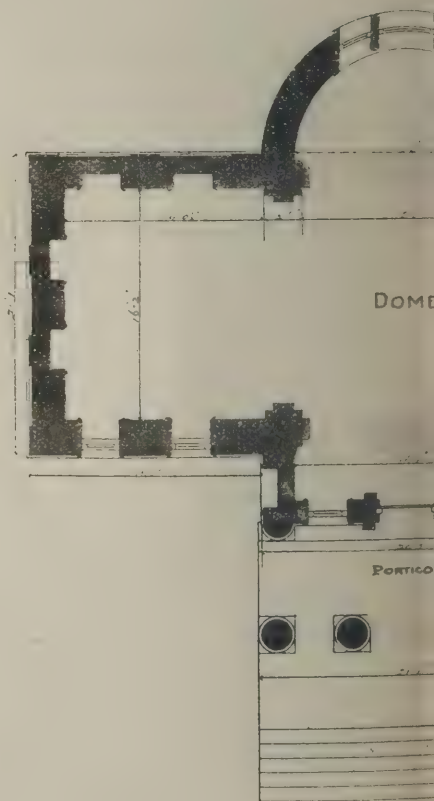
NORTH ELEVATION



WEST ELEVATION



PLAN OF CRYPT

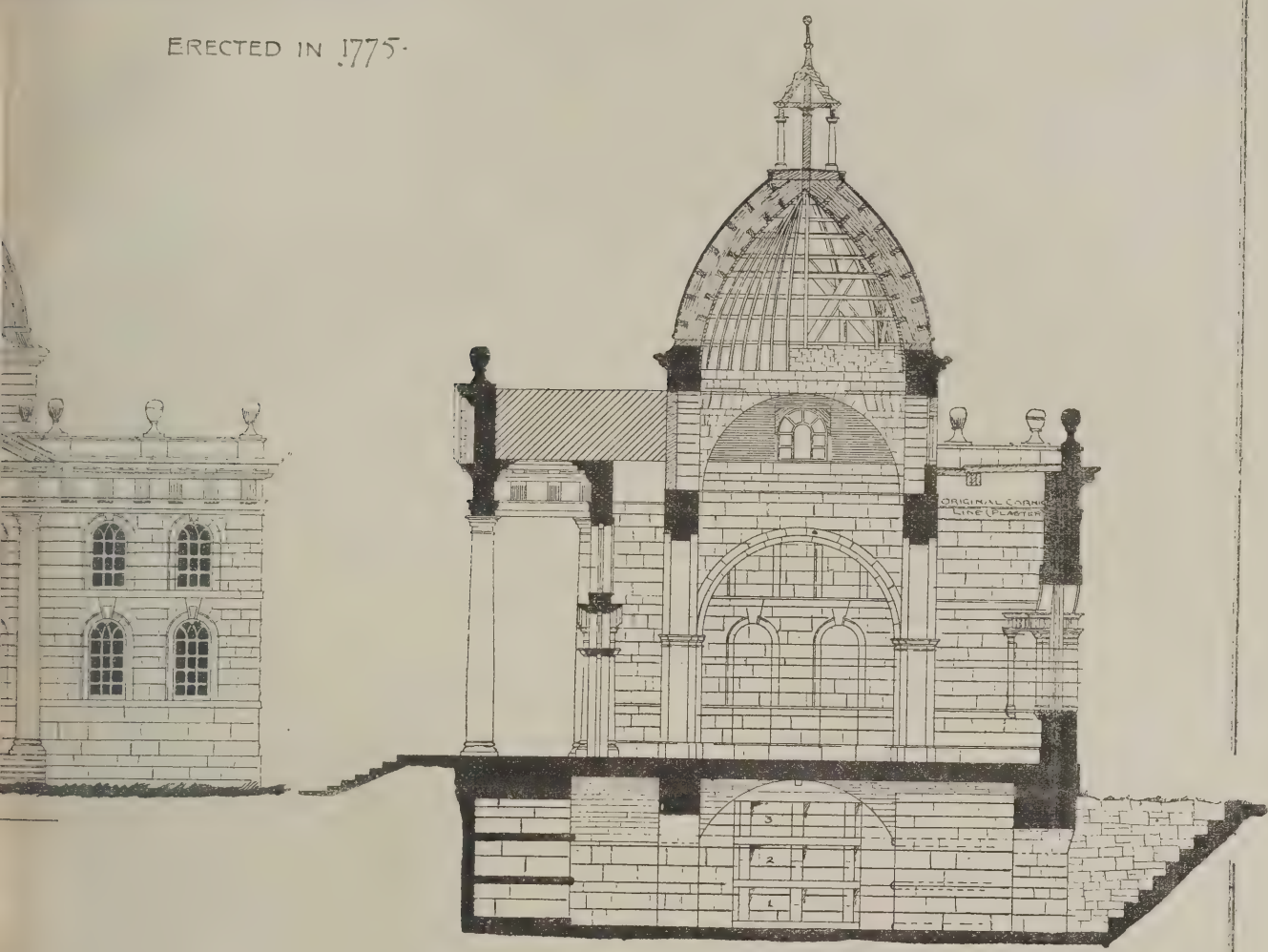


GROUND PLAN

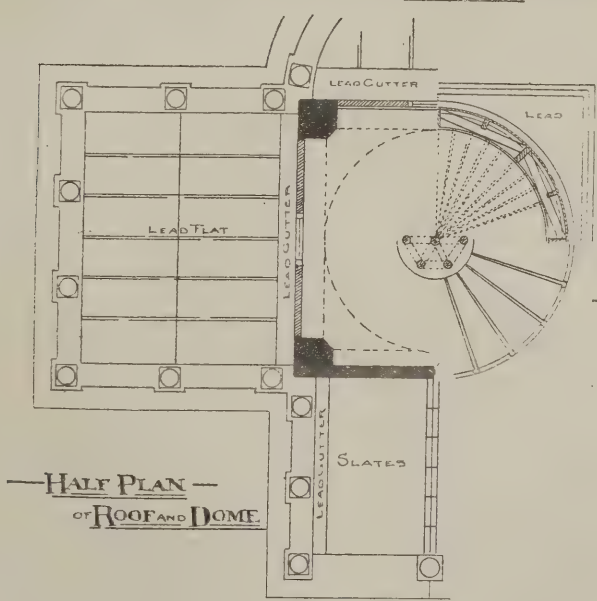
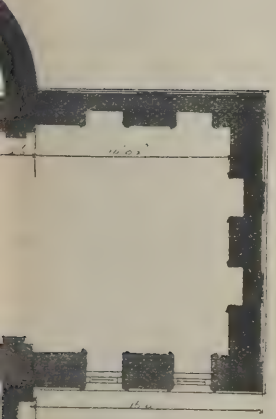
10 5 0 10 20
SCALE 8 FEET

HALL NORTHUMBERLAND

ERECTED IN 1775.



SECTION



— HALF PLAN —
OF ROOF AND DOME.

— PLAN OF DOME —
ABOVE SPRINGING LINE.

— PLAN THROUGH TURRET.

B. Peniston
Mason & Salt

STATUES, MEMORIALS, &c.

OUTLON, STAFFS.—A monument has this week been erected over the vault of the late Mr. George Meakin, of Creswell Hall, in Outlon churchyard. It consists of four white Sicilian marble bases full of moulded and carved work, carried by a white marble ledger 9ft. long by 5ft. wide, and surmounted by 14 polished red granite columns and pilasters, with moulded and carved marble bases and caps. From these spring six moulded arches, carrying an overhanging canopy having two finials. Lying underneath the canopy, and between the columns, is a large moulded and bevelled inscription top, bearing an inscription. About 20 tons of white Carrara marble have been used in the work. It has been designed and executed under the personal supervision of Mr. James Beresford, of Belper. The memorial work also includes an alabaster tablet, which has been affixed to the inside of the church. The tablet is of Gothic design, and is the handiwork of Messrs. Jones and Willis, of Birmingham. On each side of the inscription, which occupies the centre of the tablet, is a niche, with carved canopy and pedestal. The inscription is overhung by a connected series of five canopies of elaborately carved tracery. The centre canopy is slightly larger than the others, and, passing through the square upper edge of the tablet, terminates in a pinnacle surmounted by a small cross. The niches are filled with figures of angels.

CHIPS.

The new public washing-house, constructed for the Edinburgh Corporation in South Gray's close, off the High-street, is approaching completion. The buildings have cost £3,800, and have been carried out from plans by Mr. T. Morham, the city superintendent of works.

At the last meeting of the town council of Birkenhead, Mr. T. C. Thorburn, C.E., tendered his resignation as borough surveyor and engineer, which was accepted, and he was appointed by the council to the position of consulting engineer to the corporation, at a salary of £250 per annum.

An alabaster tablet, 5ft. long by 2ft. broad, was completed on Wednesday by Messrs. Williams and Clay, sculptors, Warrington, and will shortly be erected in Hawarden churchyard by Mr. and Mrs. Gladstone, in memory of their eldest son.

A stained-glass window has been placed in the south aisle of Patterham Church, the work of Messrs. Burlison and Grylls, of London. The window contains three lights. Next to this window is another, containing two lights, filled in with subjects representing the four miracles of our Lord, and by the same artists. Both are memorials of the late Col. Wight Boycott.

Mr. E. H. Tulloch, A.M.I.C.E., commissioner under the Local Government Board, held an inquiry at the town-hall, Luton, on Tuesday week, relative to the proposal of the corporation to borrow £5,500 for the purchase of the premises adjoining the town-hall. The borough surveyor, Mr. T. R. Roscoe, explained that it was proposed to acquire the property for the enlargement of the municipal offices.

In the Oddfellows' Hall, Edinburgh, the second annual *soirée* and concert under the auspices of the local branch of the Scottish National Federation of House and Ship Painters was held on Friday night. Mr. Thomas Bonnar presided.

The twenty-third annual competition and exhibition in turnery, under the auspices of the master (Sir Richmond Cotton) and the court of the Turners' Company, will take place at the Mansion House on Wednesday, Thursday, and Friday next, the 26th, 27th, and 28th inst. On the last-mentioned day the Lord Mayor will distribute the prizes.

The parish church of Peebles has just been enriched by two stained-glass windows. The two windows are of two lights each, and have been treated as one work, there being represented the figures of the four Evangelists, one in each light. The artists are Messrs. Cottier and Co., of London.

A bust of the late Right Hon. W. H. Smith, in Carrara marble, has just been placed in the Guildhall (having been executed by Mr. J. Whitehead, of St. Vincent-square, Westminster).

A new Board School in Iydale-road, Nunhead, was formally opened on Wednesday week by Mr. Diggle, M.A., the chairman of the London School Board, who, in his opening remarks, stated that the site had cost the Board £5,000, including legal expenses, while the building, which was capable of accommodating 1,200 children, had cost £23,300.

The monument which is part of the memorial to the late Bishop of Durham was unveiled yesterday (Thursday) by the Lord Lieutenant of the county, Earl Durham. The cenotaph is from the designs of Mr. C. Hodgson Fowler, F.S.A. The effigy, which was commenced by the late Sir Edgar Boehm, R.A., has been completed by Mr. Gilbert, A.R.A.

WATER SUPPLY AND SANITARY MATTERS.

NORTON, NORTH RIDING.—The Norton Board of Health have borrowed £3,000, at 3½ per cent. interest, for the purpose of constructing an entirely new scheme of water supply. At present the town takes its supply from Malton, but the board were not satisfied with the arrangement nor the prices charged. The engineers of the new scheme are Messrs. Fairbank, of Driffield and Westminster, and it is to be in full operation by March 25th next. Already the contracts are let, and the work has commenced. The source of the new supply is a spring on the Howe Hill estate, close by the Malton steep-chase course, and a lease has been obtained on low terms for 100 years. The reservoir itself is being constructed out of the Howe Hill—a massive rock-bed of oolitic limestone—and the pumping-engine and well will be placed at the foot of the hill. The water will have to be pumped about three-quarters of a mile to the town, and for this purpose a six-horse gas-engine is being erected, with automatic apparatus for self-stopping immediately the reservoir is full. The contracts are in different hands. That for the laying of the main, &c. (£650), has been taken by Mr. Firth, of Scarborough, and Mr. Bell, of Market Weighton, has undertaken the construction of the reservoir (£1,200). The storage capacity of the reservoir (area 110ft. by 33ft.) will be 250,000 gallons. The Norton Board of Health have appointed Mr. Millington, of Driffield, as their clerk of the works.

WIRKSWORTH.—The local board of Wirksworth recently invited Mr. T. S. McCallum, of Manchester, and Mr. W. H. Radford, of Nottingham, to advise them as to the best method of sewerage the district. These engineers each prepared a scheme, both of which were considered by the board in May last. There was a great similarity in the schemes for sewerage, but the engineers were at issue as to the disposal and purification of the sewage when collected. Mr. Radford recommended purification by means of lime in tanks, followed by filtration through land. Mr. McCallum was against the use of lime, and strongly in favour of adopting the international system of purification by means of ferrozene and polarite. The difference in the cost was about £300. At a meeting on Wednesday week a vote was taken on the rival schemes, which resulted in Mr. McCallum receiving seven votes and Mr. Radford one. It was decided to ask Mr. McCallum to meet the board in consultation at an early date.

Progress is being made with the construction of the new fixed bridge for the Bristol corporation by Mr. A. Krauss, the contractor. The first of the voussoirs was laid on Monday, and before long the arch will be completed. The facing of the bridge will be of blue Pennant stone, with Red Wilderness stone quoins and mouldings. The arch stones will also be of Red Wilderness material, and the pilasters will be of similar stone, connected by an ornamental iron railing. The construction of the new quay wall is nearly completed. On the other side of the bridge, the culvert which will carry the waters of the From into the Floating Harbour is also progressing.

Lady Stewart laid, on Friday, the foundation-stone of a new parish church at Grantully as a memorial to her late husband, Sir A. Douglas Stewart of Grantully, Bart. The church, which is in the Gothic style, and which is being erected from plans prepared by Mr. W. Ball, C.E., of Aberfeldy, is to accommodate a congregation of 200. It is close by the site of the old church, and occupies a commanding position on the banks of the Tay halfway between Grantully and Aberfeldy. The edifice is 74ft. by 26ft. 6in. The interior is to be fitted up with pitch-pine, with open-timbered roof. It is built of hard native whinstone, the hewing work dressings having been got from Gellyburn on the Murthly estate. The total cost is estimated at £2,000.

Mr. George Wragge, of Chapel-street, Salford, has recently completed the whole of the wrought iron windows and casements for H.M. Office of Works at the Telegraph Factories, London, and the Parcel Post Offices, Manchester (upwards of 20,000 sup. ft. and 400 casements), and has several further contracts for the Office. Also the whole of the casements at the University College, Liverpool, under Mr. Alfred Waterhouse, R.A.; also upwards of 600 of his special hopper ventilators for the new infirmary, West Derby Union, Liverpool, under Mr. Lancaster, architect, and in addition the window gearing, electric bells, telephones, and the gates, railings, balustrades, and lightning conductors. He is now completing the steel and gun-metal fronts to the cases for the reception of the Althorp Library, recently purchased by Mr. Rylands, to which he is fitting special gun-metal bolts and locks of a new kind, and has recently completed the casement and the whole of the window gearing at the Claybury Asylum under Mr. Hine, architect.

STAINED GLASS.

EDINBURGH.—A stained-glass window, consisting of three lights and tracery, was unveiled at St. James's Episcopal Church, Inverleith-row, last week. The treatment selected is one showing figures of St. George of England vanquishing the dragon, St. Andrew bearing his cross of martyrdom, and St. David of Scotland holding a model of an ecclesiastical building. These are treated in colours beneath an architectural canopy of silvery white. In the tracery openings are introduced banners bearing St. George's and St. Andrew's crosses, and three symbolical plants—the rose, the thistle, and the Italian lily.

KIRKCALDY.—St. Brycesdale Church, Kirkcaldy, has just been enriched with three windows of memorial character. The first and most striking commemorates Patrick Don Swan, for many years Provost of the town. The design is by Mr. Burne-Jones, and it has been executed at the works of Mr. Morris. Incidents in the life of Moses furnish the theme of both compartments. In the first the Hebrew lawgiver is represented in a reclining position as a youthful shepherd, clad in bright terracotta tints, surrounded by the flock of Jethro. In the upper section of the compartment is the burning bush, depicted in the usual highly conventional manner of the artist. Mount Nebo is the scene of the second division, and Moses is being conveyed to heaven by two angels, arrayed in raiment of gorgeous hue, their wings even being of a rich crimson. The other window is a memorial window lately finished of Provost Beveridge, and is on more ordinary lines. The subject is Christ pointing out Nathaniel to the two disciples as the Israelite without guile.

The Sheffield Town Council have adopted a report of a committee recommending the widening of High-street, at an estimated cost of £263,000. Previous street improvements have resulted in wide thoroughfares, the traffic from which is delivered into the High-street, a narrow, winding thoroughfare, producing a congestion which at the busiest times made the street almost impassable. Various schemes have been suggested, with a view of providing a less costly alternative route; but it has now been decided to widen the street on the south side from Fargate to Fitzalan-square, and that the new thoroughfare shall be 80ft. in width.

The Royston Park Estate, Pinner, the first twenty-seven plots of which, for building purposes, are to be sold on the estate on Monday next by Messrs. Debenham, Tewson, Farmer, and Bridgewater, is a good site for the erection of detached residences, which are badly wanted in the neighbourhood. Free conveyances will be given, and the payment, if desired, can be spread over nine years. The land-tax is redeemed, a good 50ft. road is being made on the property, there is good railway communication, and altogether there are few such eligible sites near town.

At a meeting of the joint committee of the Ross and Cromarty County Council held in Dingwall on Monday, it was unanimously resolved to sanction the construction of a new road from Stornoway to Carloway, with a branch road to Breasclete, in the Island of Lewis, and for which a grant of £15,000 is to be paid by the Government, under the Western Highlands and Islands (Scotland) Works Act, 1891, on condition that any expenditure exceeding that sum shall be provided by the Lewis District Committee. The accepted offers for the construction of the road, however, only amount to £14,149 9s. 9d.

Mr. John Chapple, for many years associated with the office of the late Wm. Burges, A.R.A., is the architect of a new nave and aisle in connection with St. Michael's Church, Brighton, and Messrs. Estcourt and Son, of Gloucester, are the builders. The contract is let for £13,000. The foundation stone will be shortly laid, and the first sod was turned the other day with a silver spade, the Bishop of Chichester being present at the ceremony. Mr. G. F. Bodley, A.R.A., built St. Michael's nearly thirty years ago in red brick, with French plate tracery windows, then the fashion with Gothic architects of the more advanced school. The design, as might be expected, had a freshness of its own and an artistic character, which has withstood the changes of taste for its dignity of proportion and design.

The Junior Constitutional Club, Piccadilly, has been fitted to the instructions of Col. R. W. Edis with nine elevators, one a large passenger elevator for the convenience of the members; one a goods and freight elevator, these two being of the regular Otis pattern, with Otis safeties; and six hydraulic service elevators, for kitchen and service purposes. These are of the regular Otis type, but have no safety appliances, the car being so arranged with shelves that attendants or passengers cannot ride. The ninth elevator is a drop lift descending from the ground to the basement floor, which, being a very short rise, has been constructed upon the ram principle.

Building Intelligence.

ABERDEEN.—The new wing of the Royal Infirmary was opened by the Princess Louise last week. The surgical block consists of four stories, three of the upper stories being for wards and the necessary offices in connection with them. The total number of beds for surgical cases is 140. The nucleus of the block, measuring 55ft. by 38ft., contains staircase, hydraulic lift, patients' clothes store, bath-rooms, ward kitchens, surgeons' and sisters' rooms, &c. Right and left of this centre block are the surgical wards. The female wards each measure 22ft. by 27ft. 6in. The floor space allotted to each patient is 90sq. ft., the air space 1,400cu. ft. Each ward has accommodation for 13 patients on the female side and 19 on the male side. In one male ward there is accommodation for 25 beds. Small wards with 6 beds are provided for special cases. Each ward has small projecting wings for sink, lavatories, and sanitary adjuncts. All the ward floors are fireproof, of coke-breeze concrete upon rolled iron joists; the floors are of Canadian maple in narrow width, and are of wax-polished and impervious surface; the walls are of cement plaster finished with Parian; all the passages, corridor, roofs, and staircases have a dado of Parian cement; all angles are rounded; the staircases are of stone, the ward windows are all alternately draw-sash and French casements; rounded balconies face the airing-yard to allow of patients getting an airing. The hospital is heated with hot-water pipes, and will be lighted throughout with the electric light. Mr. Saxon Snell, of London, was the architect.

ASTON, BIRMINGHAM.—New public baths, erected at a cost of £13,000, were opened last week. The style adopted is French Renaissance, and has been carried out in red terracotta with tile roofs. The ladies' entrance is in the centre. To the right are the first-class men's, and to the left the second-class men's, entrances. The building has been planned to economise the labour in working the baths. The first-class swimming-bath is 90ft. by 58ft., being 6ft. deep at one end and 3ft. 6in. at the other, having a water surface 78ft. by 39ft. On either side are arranged the dressing boxes, 44 in number, with brick divisions. The galleries accommodate 400 spectators. The second-class swimming-bath is 72ft. long by 47ft. wide, with a water surface 60ft. by 33ft., of the same depth as the first-class bath. On the sides are 56 dressing boxes. The whole of the baths, except the committee-room, are heated by steam. All the corridors to slipper baths are paved with Minton tiles. The corridors and private baths are lighted with the Swan-Edison type of incandescent lamps. A novelty has been introduced in the first-class baths, consisting of two powerful side lights with reflectors, fixed 3ft. below the water line. The baths have been erected from the designs and under the superintendence of Mr. W. A. Davies, the engineer and surveyor of the local board, Mr. Smith acting as clerk of works. Mr. Stephens, of Aston, is the builder, and Mr. Edwards, of Ruabon, supplied the terracotta.

GULVAL.—Messrs. J. and E. Goad, of the Phoenix Marble Works, Plymouth, have now in hand work for a floor, designed by Mr. J. Piers St. Aubyn, for the chancel of Gulval Church, Penzance, which has been recently restored. The floor is composed of tiles made in the geometrical shapes used in tessellated pavements, the marble being the variegated green obtained at Kitley. It is blended with the rose-colour tinted marble from Radford, and white Sicilian. Some 1,300 pieces, in squares and half-squares, are being used to cover a superficial area of 36 yards. Other floors treated in a similar manner by Messrs. Goad have been sent to Kiungani Chapel and Christ Church (Zanzibar), New Raadzal, Bloemfontein, and the parish churches of Penkridge, Salcombe, and Meavy. The same firm have just completed 150 marble columns, and also marble steps for Budleigh Salterton Church, and a font for St. John's Church, Kensington, the bowl of which weighs 30cwt.

EDINBURGH CASTLE.—The Princess Louise opened, on Tuesday, the Parliament Hall at the Castle, which has been restored by the munificence of the late Mr. William Nelson, from plans by Mr. Hippolyte J. Blanc, A.R.S.A. The building, which is 80ft. by 33ft. has for many years been used as a military hospital. Its fine

open-timber roof has now been renewed, and with its oak-lined walls, stained-glass window with heraldic emblems, carved screen, and old baronial fireplace, the hall will add a new feature of interest to visitors to the Castle. The upper spaces of the walls have been utilised for the purpose of displaying upon them ancient armour and weapons of warfare, obtained from the old armoury at the Castle, and also from the Tower of London. For this mural decoration with armour the design of Mr. John A. T. Bonnar, artist, was accepted. In giving effect to Mr. Bonnar's design, over 2,500 pieces of armour and weapons of various kinds and periods have been used. They consist, for the most part, of examples of coats of mail and helmets of the Cromwellian and other periods, war drums and trumpets, spears, battle-axes, basket-hilted swords and sabres, pistols, and targes, and shields; and along the roof, depending from the open rafters, have been hung a number of old flags, chiefly militia colours of the Early Georgian period. Similar flags furled have been displayed at the sides of the various windows of the hall. Unfortunately, the weapons are not arranged in historical order or sequence, but have been treated merely from a decorative point of view.

EDINBURGH.—The Royal Sick Children's Hospital is about to be rebuilt on a fresh site in Rillbank-terrace (the older structure in Lauriston-lane having been acquired for adding to the Royal Infirmary), from plans by Mr. G. Washington Browne, A.R.S.A., at an estimated cost of between £25,000 and £30,000. The approved design shows a building based, in its style, upon the English Renaissance, occupying three sides of a quadrangle, having the administrative department in the centre block and the wards in the wings. The central building is carried up two stories above the wings, and is finished on its east and west ends with gables with chimneys. A feature of the façade is the large square projecting oriel windows, which balance each other on each side of the central doorway, and are carried above the wall-head to terminate in a gable. Between these projecting oriels, and on the same plane, is the entrance porch. The wards are 140ft. apart, and stand north and south. Each of the four wards is 34ft. 6in. by 23ft., and 15ft. high, and gives accommodation for 24 beds. On the second floor there is in the east block a spare ward with accommodation for 16 patients; while in the west block, on the second floor, is an observation ward with four beds, and two isolated wards with one bed in each. This gives a total of 118 beds in the new hospital. The walls will be of red sandstone, and the floors throughout will be carried on steel beams and lined with cement concrete.

HARROGATE.—According to the local newspapers the building trade was never so prosperous in Harrogate as at the present time. The completion of the Station Bridge improvement is rapidly drawing near. On Monday the continuation of the construction of the new watercourse in Low Harrogate was commenced. One of the most important developments Harrogate has known is Councillor Simpson's handling of the Duchy land from Ripon-road to Cornwall-road. The plans for the development of the Dragon estate have been passed, and operations will speedily begin here, where it is intended to open out twelve new streets. On the Spring Bank estate several semi-detached villas are being erected. The new wings at the Hydropathic establishment are rapidly approaching completion, while the buildings at Harlow Manor have been largely augmented for a new Hydropathic Company. The West End Park estate is being rapidly developed, and a large number of building sites have recently changed hands and building operations commenced. In the immediate vicinity buildings are being erected, and the town was never apparently in such a prosperous condition.

HENSHAW.—The memorial stone of a new chancel and vestries about to be added to the parish church of Henshaw, near Yeadon, was recently laid. The buildings will supersede a chancel and vestries of very diminutive proportions. The chancel will be 29ft. by 19ft., and opens into the nave by an elevated and moulded arch, supported by clustered columns. It will be lined throughout with bolstered ashlar, and will contain at the east end a five-light window with Geometrical tracery in the head. It is divided into three bays, each of which contains a clerestory window filled with tracery. To the north of the chancel, and opening into it by an

arch of a similar character, will be placed the organ-chamber, and to the south will be the choir and clergy vestries. In the chancel sedilia and credence tables will be worked into the main wall of the building. The nave will be re-seated with polished walnut seats, and an organ and a memorial stone pulpit will be erected as special gifts, and new floors will be laid throughout. The architects are Messrs. T. H. and F. Healey, of Bradford, and Mr. James Taylor, of Yeadon, is the contractor. The work is estimated to cost £1,800.

JERSEY.—The new church of St. Aubyn is approaching completion. It is built entirely of granite, the exterior walling being of pink Mont Mado granite with dressings of grey Perruque granite; the quoins from the former chapel were utilised where possible. The interior is plastered, with pink Mont Mado columns, arches, and dressings. The dimensions are 94ft. by 41ft. The roofs are trussed open-timber, of fir, boarded inside and covered with Broseley tiles. The flooring under the seats is of wooden blocks on concrete, while the passages and chancel are of coloured tiles in patterns. The church consists of nave, aisles of five bays, chancel, chancel aisle, organ chamber, and vestry. A tower and spire will ultimately be built at the south-western angle. The church will seat 340 people, the seats throughout being of oak. There is a reredos of alabaster with bronze shields bearing emblems of the Evangelists and the sacred monograms, executed by Mr. H. T. Margetson, of Chelsea. Three stained-glass windows are the work of Messrs. Heaton, Butler, and Bayne, of London. The style is Early English. The church and fittings were designed by, and carried out under the superintendence of, Messrs. J. E. K. and J. P. Cutts, of London. The contractors were Messrs. Woodsford and Harris and Mr. T. Blampied, and Mr. J. Laurens was the clerk of the works.

LICHFIELD CATHEDRAL.—Towards the £20,000 appealed for for restoring the fabric of the Lichfield Cathedral the committee have so far received donations or promises amounting to upwards of £5,000. With this sum in hand the Dean and Chapter have undertaken the following portions of the work: (1) The restoration of the large window in the north transept; (2) the insertion of new mullions and tracery in two of the windows of the Lady-chapel; (3) the repair of the western side of the north transept, which was in a dangerous condition; (4) the restoration of the southern and eastern faces of the central tower. The Dean and Chapter, with the entire concurrence of their own architect (Mr. John O. Scott), have sought the advice of Mr. John L. Pearson before proceeding further. Mr. Pearson has inspected the cathedral, and has presented his report, in which he states that the condition of the south transept is by no means satisfactory. Considerable restoration is needed on each side of it; but more especially on the west side. He should be disposed to leave the design of the great south window as it now is, and no alteration should be made in the curious tracery in the circular window in the gable. It is absolutely necessary to restore to some extent the decayed stonework of the windows and buttresses of the north arch of the nave. Much external reparation is needed to walls, windows, &c., of the chapter-house and vestibule. The damage done by the falling of the spire to the vestibule should be made good, and he would include the restoration of its groining. The chapter-house is a building of so much interest that no pains should be spared in rearing its lost and decaying features.

SALT.—The reopening of St. James's Church, Salt, near Stafford, after restoration, took place on Thursday last week. The church was built by Charles, second Earl Talbot, in 1842-3, and is constructed of Weston stone, in the Early English style, comprising nave and chancel, south porch, and eastern bell-cote with spirelet. The alterations just completed consist of the removal of the west gallery and the whole of the old pewing in the nave, in place of which solid benches of pitch-pine have been substituted. The stone-flagged flooring has been taken up, and wood-block flooring (A. F. Whittome's patent) laid under the part occupied by the seats and the passages with tiles. The under surface of roof has been covered with pitch-pine boarding. The bowl of an ancient font, which had been for some time in the churchyard, has been restored and adapted to a new shaft and base. The old stone pulpit has been

replaced by one of oak, from the designs of a well-known Exeter firm. The alterations have been carried out by Messrs. Adams and Pemberton, from the designs of Mr. N. Joyce, architect, Stafford, at a cost of £500.

WEST DERBY, LIVERPOOL.—A hospital is being built for the West Derby guardians. It is constructed of grey and red brick with terracotta and sandstone dressings. The administrative block is enriched with terracotta, and has a projecting porch of red sandstone. It is designed in the Elizabethan style. The ground plan of the hospital is a double H, thus; |—|—|, and consists of five ward blocks, the central anterior limb being the administrative block. The administrative block consists of four stories, including the basement. The basement contains porter's room and dormitory, bath-room and lavatory, mess-room, and store-rooms. On the ground-floor are offices and sitting-rooms for the staff, dispensary, committee-room, kitchen, pantries, and lavatory. On the first floor there are bedrooms and bath-rooms for the medical staff and matron, and linen and sewing rooms. On the second floor there is bedroom and bath-room accommodation for the house servants of the staff. Between the administrative block and the ward block behind is a kitchen, the walls of which are built of white glazed brick with dado. It is lighted from the roof, and connected by hydraulic lifts with each ward. On each side are the male and female receiving-rooms, with bath-rooms attached. There are 20 wards, 16 of which are 108ft. by 24ft. and 14ft. in height, containing 36 beds each. The remaining four wards measure 96ft. by 24ft. and 14ft. high, containing 32 beds each. At the rear is the older lunacy annexe, containing 150 beds, making a total of 1,000 beds. The ward floors are of pine blocks laid in asphalt on concrete. At one end of each ward there are a day-room, a separation ward for two beds, a duty-room, and two linen-closets. At the other end of each ward and forming an annexe are bath-room, water-closets, and sink. Separated from the hospital by a road, but connected by a subway, is a nurses' home, three stories in height. The architect of the buildings is Mr. Charles Lancaster, and the contractor Mr. E. Gabbutt, both of Liverpool.

YORK.—The Lord Mayor of York opened on Wednesday the new law courts, police, and fire-brigade stations. The buildings are situate at the corner of Clifford-street and Lower Friargate, near the Castle. They have been designed by Mr. Huon F. Matear, F.R.I.B.A., and the work has been executed under his personal superintendence. The style adopted is a free treatment of Gothic. The external elevations was faced with red pressed bricks, with Staindrop stone dressings to the doors and windows. The main entrance in Clifford-street is surmounted by a gable filled in with subject carving representing King John creating the first Lord Mayor of York, and terminated with a figure of "Justice," behind which rises a clock tower constructed in oak, with clock and bell by Messrs. Potts and Sons. A bust of the late Duke of Clarence, executed by Mr. Williamson, of Esher, has been placed in the entrance-hall. The principal apartments on the ground floor are the session and police courts, placed end-on to each other, and there are also rooms for judges, magistrates, and magistrates' clerks, and the petty juries. On the first floor are the grand jury room, and a suite of rooms for the school board, and the second floor provides apartments for the caretaker. The police station and offices are situated in Lower Friargate, and under the courts, and entered from the corridor are twelve cells for prisoners awaiting trial. Constables' apartments are provided on the floor above police office, while a drill-yard is entered from Lower Friargate. The police-station is placed at the lowest corner of Lower Friargate, and along the river front of the building there are quarters for firemen and their families, and a resident superintendent. The furnishing and decorations have been executed by Messrs. Waring and Sons and Messrs. Belleby and Sons. The principal contractors for the works were Messrs. Parker and Sharp, of York, and Mr. English acted as clerk of works.

The Infectious Hospital, Widnes, is being warmed and ventilated by means of Shorland's patent Manchester grates and patent Manchester stoves, the same being supplied by Mr. E. H. Shorland, of Manchester.

Correspondence.

ARCHITECTURE: A PROFESSION OR AN ART?

To the Editor of the BUILDING NEWS.

SIR,—At last the threatened thunderbolt has fallen in the shape of "Thirteen Short Essays on the Qualifications and Training of Architects," edited by R. Norman Shaw, R.A., and T. G. Jackson, A.R.A., and published by John Murray, Albemarle-street.

It is somewhat difficult to understand why one or two of the essayists were imported into the undertaking, except on the ground that numbers have an appearance of strength, and that whether or not the writers had sufficient technical knowledge of the subjects upon which they have elected to inform the public, still there is the essay; and one or two sentences may, after all, "catch on," and so a weak cause receive a little buttressing, every inch of which is needed.

We can dispose of the numberless platitudes and truisms which occupy, at least, 75 per cent. of the thirteen essays by the remark that, however interesting they may be in the lecture theatre of a students' college, they can have very little weight in a controversy of this kind, and they have not even the merit of being clothed in that respectable English which sometimes gives an appearance of reality to an intangible dream.

Mr. W. B. Richmond, A.R.A., gives us his "Thoughts on Three Arts and the Training for them," and I shall be better able to judge of the true value of his "thoughts" when they are elevated to *practice* in the work he is commissioned to do in St. Paul's Cathedral.

Mr. John R. Clayton, in "The Isolation of 'Professional' Architecture from the other Arts," has been injected with the utterly erroneous view that the Institute does not, in the very highest degree, pay tribute to "art," in its noblest form, *when it is to be seen*;—the great difficulty always is to lay one's finger upon the precise spot where modern "art" in England stands out as undeniably as it does in the old works in Belgium, France, and Italy. Of course, we are duly grateful to Mr. Clayton for informing us that "it is of supreme importance that edifices which stamp the aspect of our cities and public places, to our credit or discredit as an artistic people, should bear marked evidence of our regard for architecture, not as a profession, but as an art," and one is tempted to point out to him that so long as our edifices bear "marked evidence of our regard for architecture," it matters little whether the result is due to "profession" or "art."

Mr. J. T. Micklethwaite heads his essay "Architecture and Construction." He has his fing at the Institute, and finishes up with the satisfactory remark that "already the proportion of buildings which rise to the level of architecture is greater than it was." It is a thousand pities that he did not tell us what he meant by "was," and name a few of the structures which exhibit the rise in level to which he refers.

Mr. Gerald C. Horsley meanders along under the title of "The Unity of Art" till his emotion gets the better of him, and, speaking of Sedding's Holy Trinity Church at Chelsea, he tells us that certain spaces in the roof and the broad frieze were "lovingly" prepared by Sedding for paintings by Burne-Jones. I do not know that "cant" can go further than this, and I desire to express my deep condolence with Mr. Norman Shaw, as one of the editors, in not eliminating from Mr. Horsley's essay the ungrateful smack the latter gentleman has at his chief in the following sentence: "Instead of seeking reconciliation with the sister arts, architecture has taken refuge in a series of revivals of mere forms of past art, thus producing links which of necessity have less vitality the nearer they succeed in approaching their models." The italics, Sir, are mine.

Mr. Mervyn Macartney, in "The Protection of the Public," is harmless, except when he misstates the assurances given by the Institute as regards its members, and Mr. Ernest Newton, in "Architects and Surveyors," has a good go at the "practical architect"—dreadful man that "practical architect"—having previously smartened himself up by the sublime "thought" that "there will be no real life and natural development in architecture till the architect is brought more into contact with his work, seeing it develop day by day, 'meeting and overcoming dif-

ficulties as they arise," &c. Yes, Mr. Newton, there are several architects in London who would like to be brought more into contact with their works if you would only show them where the works are.

Mr. Edward S. Prior writes under the head of "The Profession and its Ghosts," and Mr. W. R. Lethaby in "The Builders' Art and the Craftsman" takes up twenty pages of the book in proving the utter impossibility of his contention; and Mr. Reginald Blomfield, in "The Institute Examination and Architecture," labours hard to throw discredit upon the Institute and all that it does.

The other essayists are Mr. Norman Shaw, R.A., who writes under the title "That an Artist is not Necessarily Unpractical," Mr. G. F. Bodley, A.R.A., under "Architectural Study and the Examination Test," Mr. Basil Champneys, B.A., on "The Relation of General to Technical Education in the Training of an Architect," and Mr. T. G. Jackson, A.R.A., on "True and False Ideals in the Education of an Architect."

Now the whole object of the latter four gentlemen appears to be to endeavour to prove to the public (1) that the Institute system of examination is bad, that it ignores the claims of true art, that no man who follows its precepts can ever rise to the pinnacle of real architectural merit to which these gentlemen have attained, and that (2) they, not being members of the Institute, have, somehow or other, been endowed with superior art faculties, which have enabled them to bestow upon the world the most glorious examples of artistic excellence, the dreams of gods, the ideals of poets. In the desire to impress their extraordinary powers upon a confiding British public they quietly ignore the challenge I threw out to them to state how much of many architects' work is relegated to the "specialists" whom I set forth in the *Times* during the controversy in November, 1891. Now I ask Mr. Jackson and Mr. Norman Shaw to believe me when I say that, if I could find works of theirs which to my mind exhibited the art feeling so much insisted upon by them in their writings, I should be one of the first to express my admiration in unqualified tones; but facts stare me in the face which I am powerless to pass over. For example, some of Mr. Norman Shaw's well-earned reputation was gained by his beautiful little "Lowther Lodge" at Kensington; but a few years after he did not hesitate to crush its proportions and to utterly mar its artistic effect by erecting that monstrous and ugly flank wall of the Albert Hall Mansions next door to it. I want to know where the art feeling comes in there?

Mr. Basil Champneys has just erected an hotel in Kensington High-street, which, for stupendous and unmitigated ugliness, is not to be beaten by any modern building in London. I should like to be informed by Mr. Champneys where to look in that building for the result of his wonderful art knowledge, and I ask him to accept my assurance that if he will deign to point out the beauties of his hotel, I will immediately withdraw every word I have said against it, and apologise to him for my ignorance.

Mr. Bodley has occupied for about two years the choir of St. Paul's Cathedral in "decorating" the stonework. The "cream and gold," which formed the leading basis of the scheme is now to be got rid of, and the cathedral is to be restored to its original appearance, so that, after two years of opportunity, the authorities have to go back to "as they were" (if they can, which I much doubt), because somehow or other the "art" did not come up to expectations. Where is the superiority here?

Mr. T. G. Jackson has, in the quadrangle of Hertford College, Oxford, made some additions which are positively startling. A new external staircase here, as regards lines, proportions, and details, is one of the most extraordinary efforts to be found even in modern work in Oxford. It is utterly devoid of art feeling, and is, to my mind, a very regrettable piece of work. Where is the art here?

As I have said time after time before, I am not content to be told by any number of Mr. Jacksons or Mr. Shaws that they are the real "Art" men, and that Institute men are a mere set of surveyors, agents, &c., without any feeling or capabilities. I ask to be told where the Art works are to be found, and silence is the reply. Let Mr. Jackson tell me where to look, and I will at once look; but tons of words—words—

words—have not, with me, one-tenth the effect of works—works—works. Measures, not men; sincere feeling, not cant.—I am, &c.,

WM. WOODWARD.

13, Southampton-street, Strand.

ARTISTIC "FELLOWS" AND ORDINARY "MEMBERS."

Sir,—Among the welcome things one reads this year in the professional Press on one's return from the summer holiday are two letters appearing in one of your contemporaries, signed respectively by Mr. John Belcher and Mr. John Brydon, supporting a proposal which, if carried out, would, I believe, go far to advance the cause of pure architecture.

The proposal, briefly stated, appears to be that, while a compulsory examination should be still applied as a test of ordinary membership of the Institution, the Fellowship should be given in recognition of artistic merit only, which, as the authors of these letters truly remark, is a necessary qualification to the title of "architect."

It would be suicidal on the part of the R.I.B.A. to abandon the examinations (never mind by what title they are known), for the simple reason that the public do not, generally speaking, demand a high standard of artistic work; but they do demand thorough acquaintance with the planning, constructional, sanitary, and business side of architecture, knowing, naturally enough, that consideration of convenience and health come even before art.

Unfortunately, the present limited application of this examination does not allow of our telling the public that, in engaging an architect, they may have confidence in his qualifications to this very important extent. When a Registration Bill is passed we can do so, and if Mr. Belcher's proposal is adopted, those of the public who want an artist as well as a man of business can some day depend on getting one by selecting a Fellow of the R.I.B.A.

Although the public do not demand a high art standard, they do expect some taste and power of delineating one's ideas, and the possession of both these qualifications, though not their degree, can be sufficiently tested for this purpose. We must take care, therefore, that these subjects continue to form part of the examination for Associateship.—I am, &c.,

W. H. SETH-SMITH.

WALSALL PUBLIC BATHS COM-PETITION.

Sir,—From the reports of the Walsall town council meeting when the above competition was settled, I gather the following facts: Two of the three premiated designs will not go on the land, the first encroaching on the land reserved by the council for the erection of shops; the design placed third takes in 3ft. of the land on the left-hand side of the site; neither the first nor second designs has separate entrances to the female slipper baths; there is only one entrance to design No. 1, over which coals and everything have to be taken; no provision for replacing the boilers is made. I have heard it said that if this plan is carried out, and anything goes wrong with the boilers, the baths will have to be pulled down to take in a new boiler. The third design has no waiting-rooms. The committee were advised in their selection by the borough surveyor, who is spoken of by the mayor as an eminent architect.

Probably many competitors will think, with me, that none of the premiated designs ought to have been selected.—I am, &c.,

DISGUSTED COMPETITOR.

LAND SURVEYING.

Sir,—Will Mr. Cobham turn back to my letter of October 7th, and favour me with a straightforward, point by point, reply?

We need no differential calculus (of which, by the way, I know quite enough to enable me to detect Mr. Cobham's false premises—but that is neither here nor there), or any kindred operation, applied to so simple a question. That is like using a hundred-ton gun to play at marbles with. What I look for, and what I think I (and your interested readers, if any such there be, are as well) am entitled to, is a direct reply, Aye or No, to the following points raised by the letter before alluded to: Are my figures given there substantially correct, or are they not? If they are not, give the correct ones. Is 5.5 (approximately

even) the half of 24? Or 4 (approximately even) the third of 24? Is a loss of three-fourths of efficiency (my check is 25, his is 7) a trivial matter?

As to Fig. 4, will Mr. Cobham explain what difference it makes in plotting whether the line B C is measured from B to C, or *vice versa* providing the error of 40 links is kept between B and D in each case. If he desires to have us believe that he has placed the error between D and C (and in no other way can A F be altered anything like 23 links) then he will excuse me saying that he has been setting up a ninepin of his own to knock down again, and will pardon my asking him to turn his attention to mine, which is, so far, intact. I have carefully located the error between D and B from the beginning, and Mr. Cobham has so far given no indication of any misunderstanding on his part whatsoever, so I may have misjudged him. If so, I beg his pardon. Whether or no, will he embody in his reply an opinion whether I am correct or not in my letter of October 7th when I say that A F is no check on the length of B D, and if it is not (he seems by his last letter to have abandoned it and flown to E D as the check, although, *more suo*, he doesn't deliberately say so), will he say whether my statement, that D falls about three links inside or outside C B, according as D B is lengthened or shortened 40 links, is correct? And if, in his opinion, a variation of three links is a sufficient, a reliable, and a trustworthy check?

Never mind about the competent authorities; let us do a bit of thinking for ourselves, and, taking Mr. Cobham's advice, let us "not allow a hard and fast rule to override the needs of particular cases, every one of which demands a little extra study."

He might, perhaps, in his reply tell us why, on August 5th, five links was such a short length and so hard to plot, and on September 23rd seven links was such a long length and so easy to detect.—I am, &c.,

NORTHMAN.

BRICKS.

Sir,—Referring to the remarks in your last issue respecting the Hetton bricks, my experience of them agrees with the report thereon, except that for damp situations and where exposed to weather they will not, I think, bear comparison with a good hard London stock. I believe in their manufacture they undergo machine pressure, consequently all moisture is taken out, and so soon as the face of the bricks is destroyed they crumble away. I have seen this occur very largely in dwarf walls where they have been used. For inside work, they are a first-class brick; but I should hesitate to use them in damp or exposed situations. I shall be glad to hear other opinions.—I am, &c.,

WM. THEOBALDS, Architect.

26, Budge-row, London, E.C., Oct. 18.

CHIPS.

Mr. J. Passmore Edwards, says the *Daily News*, who has recently built and endowed the Cornwall Convalescent Home at Perran Porth in memory to his mother, is building an educational institute to the memory of his father at Hayle; and a library and scientific institute at St. Agnes to the memory of his elder brother, and a school and meeting-room at St. Day in memory of his late uncle, John Edwards. All the places mentioned are in Cornwall.

A new branch bank for Lloyds, Limited, has just been completed at Bexhill-on-Sea. It is faced with local red bricks, with moulded Beaufort brick designs. Mr. Arthur Wells, of Hastings, is the architect, and Mr. Peter Jenkins, of St. Leonard's-on-Sea, the builder.

The Home Secretary has appointed Mr. Robert Collier Driver to succeed the late Mr. Ryde as one of the arbitrators in connection with the Boundary-street scheme of the London County Council.

The London County Council has decided to deal with the Peckham-rye Extension as a place to be closed at night time, but not as a park. Mr. Blashill, their architect, has been requested to bring up an estimate to provide for the erection of a suitable open iron boundary fence. The decision of the Council is in accordance with resolutions passed by the committee which negotiated the scheme, and also by the Camberwell Vestry.

The Dean and Chapter of Peterborough decided yesterday to accept the offer of "A Friend" to provide a new organ for the cathedral at a cost of £3,000. A condition of the gift is that the donor's name is not to be divulged.

Intercommunication.

QUESTIONS.

[10870.]—**Dry Rot.**—Will someone be good enough to favour the querist with his experience with regard to curing an advanced case of dry rot? The building affected stands high on chalk, and is situated as shown by rough sketch. The timber in cellars and the floors of kitchen and offices are the parts attacked. The cellars are damp, and when first brought under my notice unventilated. I fixed ventilators in opposite walls to create a draught, and removed rotten woodwork, fixed new timber, and thoroughly dressed it with turps and red



lead. The fungi shortly after appeared on the new work, and in spite of frequent scraping and dressing with red lead is spreading. What is the best remedy, and can any dressing be applied to the walls and woodwork capable of exterminating the nuisance? An early practical reply will much oblige.—EX-WISE-ED.

[10871.]—**Overhanging Cornices.**—Is an overhanging eaves cornice permissible? Can the adjacent owner make any legal objection if the gutting is properly fixed, and what is the law of the case?—E. T.

[10872.]—**Covering Area of Building with Concrete.**—Is this by-law in operation everywhere within the Metropolitan area? If so, how is it many new houses are erected without it? Perhaps some practical official of the L.C.C. can inform.—PERPLEXED.

[10873.]—**Boasting.**—What is the meaning of "boasted" work in masonry? If any reader of your journal could inform, it would probably instruct others besides.—ONE WHO WISHES TO LEARN.

[10874.]—**Roofing of Space.**—I have a roof to design which will be wider at one end of the building than the other. Can any practical man tell me how to get over the difficulty without injury to the external effect? Any ideas will be gladly received.—YOUNG ARCHITECT.

[10875.]—**Drainage of Dwelling-Houses.**—The model By-laws of the Local Government Board, after requiring a disconnection of drains within the curtilage of a house from the main sewer by means of a trap, proceed to direct, taking one of the alternatives, that an untrapped opening to the drains shall be provided at the level of the ground on the house side of the trap to act as an air-inlet, and that at the highest point of the system a vertical pipe be fixed, to act as an upcast shaft or extractor. It also permits the soil-pipe to connect directly with the drains, and perform the duty of an extractor for the gases or foul air. Can this be considered a desirable or safe arrangement? The committee of a public authority with which I am connected are now engaged in revising and adapting these by-laws, and I advise the entire disconnection of the soil-pipe with the drains, and suggest a separate pipe for ventilation. It appears to me that, considering the risk of unsealing the closet trap by siphonage, evaporation through constant use, leakage through cracked earthenware or other cause, is constant and great, and in such event the house becomes at once the exhaust for the drains. I shall be glad to have opinions on this point, which, to my mind, is of first importance.—P.

REPLIES.

[10833.]—**Timber and Its Position.**—Why does not S. F. Harris say in what wood he has seen the sap-valves which he described as opening upwards; or, in the alternative, state the source of his information, instead of advising me to "read some authorities on timber and its growth"? I did that half a century ago, and have since examined numerous specimens of plant structure, both in the form of recent growth, and also of seasoned timber. The circulation of the fluid contents of plant cells, as seen under high powers of the microscope, is also familiar to me, but the sap-valves which your correspondent mentions have hitherto escaped me. I do not say they are non-existent, for I believe we have not yet got to the bottom of the mystery of sap circulation, and I am well aware of the difficulties to be overcome in the demonstration of many of the most minute parts of plants. If, however, your correspondent will enable me to find the valves, I will endeavour to illustrate them by a drawing, and will send it to you, Sir, for the benefit of your readers, should you see fit to use it.—E. S.

[10837.]—**Testing Drains.**—With reference to Mr. Buchan's suggestions on this subject on p. 543, and his criticisms on mine of last week, I should like to say that on several occasions I have found the spike-test inefficient in determining defects which the ether test has once located. I do not, however, suggest that I have used a similar machine in applying the test as he mentions. Then as to the ether test being "too indefinite for a court of law" in his opinion, I can only say, with reference to that statement, that I have proved a case of defective drainage in a law court by the ether test, which was accepted by the learned judge as absolutely sufficient proof of the defects. There is no doubt, however, that unless this test is very carefully applied by well-qualified operators there is the risk of unfair condemnation, as suggested by Mr. Buchan, which should be particularly guarded against, in the interests of all concerned.—C. EST.

The enlargement of Brompton Hospital chapel having been completed, the Bishop of London will reconsecrate it to-morrow (Saturday).

Legal.

THE NEW STREET WORKS ACT.

THE Private Street Works Act, 1892, briefly noted last week, contains several clauses which are of immediate interest to architects, surveyors, and builders. The statute gives so many advantages over the Public Health Act, 1875, that it is pretty certain to be rather generally adopted by urban sanitary authorities, while it is also likely to be applied by order of the Local Government Board to rural districts. Sections 9 and 10 are especially of practical importance. By Section 9 the local authority may include in the works to be done under this Act, with respect to any street, any works which they think necessary for bringing that street, as regards sewerage, drainage, level, or other matters, into conformity with any other streets, including the provision of separate sewers for the reception of sewage and surface water respectively. Here we have a power to make needful and permanent improvements far beyond the ordinary paving, making, &c., of a new street, but which must, when used, increase the expenses. This method of raising levels, and getting better drainage, is a step in the right direction, though it may, and indeed must, impose heavier burdens upon new properties. The other part of this clause settles a vexed and undecided question, by enabling the local authority to add a commission of 5 per cent. beyond the estimated cost of the works in respect of surveys, superintendence, and notices, which is to be carried to the credit of the district fund.

Section 10 is, however, even more of an innovation, for it distinctly recognises the principle of betterment, and applies it practically. This is done by providing that, although in the preliminary and provisional apportionment of the expenses of private street works, the frontages of the respective provisions shall be considered as before, yet the local authority shall have regard to the following considerations:—“(a) The greater or lesser degree of benefit to be derived by any premises from such works; and (b) the amount and value of any work already done by the owners or occupiers of any such premises.” Further than this, it is declared that they may also include any premises which do not front, adjoin, or abut on the street, but access to which is obtained therefrom through a court, passage, or otherwise, and which in their opinion will be benefited by the works; and may fix the sum or proportion to be charged against these other premises accordingly. In other words, while the local authority can increase the expense of new street work by doing it better and more thoroughly they can also extend the area of the premises, amongst the owners of which that expense is to be apportioned. They can also regulate that apportionment by having regard to the benefit gained from the works to be done by each house or premises, according to its situation, and this, of course, is only to apply the principle of betterment in a fair and reasonable manner.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed “BUILDING NEWS,” and must reach my offices, as above, by Tuesday morning to insure answer same week.

R. AND S.—REBUILDING.—ADJOINING OWNER.—If the work is carried out in a proper manner, and without any unusual noise, it would not legally amount to a nuisance, and I do not see what proceedings can successfully be taken by the adjoining occupier as he threatens; though he may, of course, bring an action for damages if he likes.

CONSTANT SUBSCRIBER.—SURVEYOR.—You could make valuations of the kind suggested, if for the information of one party only, and not binding on both, without any license as an appraiser. No. 5 in your list would also be lawful. But as to the other four cases, if the valuation is really for both sides, or is to be received in evidence, a license would, strictly speaking, be necessary, and so would a stamp upon the valuation itself.

NORSEMAN.—ARCHITECT.—CHARGES.—The three per cent. remuneration payable to an architect when the work has gone as far as accepting tenders and is then abandoned, has nothing to do with taking out the quantities. This is usually paid to the quantity surveyor, and must be arranged for separately.

T. M.—LEASE.—NOTICE.—As the taking a lease appears to have been given up or waived by both parties, and a yearly tenancy created by B. occupying and paying A. a yearly rent, as I suppose, he can only quit after giving A. the usual six months' notice, to expire at the end of a complete year of such tenancy.

ECCLDS.—SEWER.—DRAIN.—Under the Public Health

Act I consider this would be a “sewer,” as it goes under a road and is not merely a drain for the purpose of draining premises “within the same curtilage.” Regarded as a sewer, the owner should be called upon to provide the proper ventilation, &c.

LEGAL INTELLIGENCE.

A CORPORATION FINED FOR RIVER POLLUTION.—On Thursday in last week, at the police court at Bury, Lancs, the case against the Bury Corporation for the pollution of the Irwell and the Roach, taken at the instance of the joint committee of the Mersey and Irwell Rivers Pollution Board, was resumed. The magistrates ordered the mayor, aldermen, and burgesses to pay a fine of £5 and £20 costs in each of the two cases, and further ordered that the liquid sewage matter be diverted from the rivers Roach and Irwell within twelve months.

INTERCEPTION OF LIGHT AND AIR.—WOODWARD v. MOULDER.—At the Cheltenham County Court on the 11th inst., Judge Elliott gave judgment in this case, the evidence and arguments in which were completed at the August court. He said:—This is an action brought to recover £50 damages for an alleged obstruction to light and air. Up to May, 1891, the property which is the subject of the action consisted of two freehold tenements, Nos. 1 and 2, Clare-cottages, Bath-road, standing some distance back from the line of frontage, with a small garden in front of each. On May 21, 1891, the common owner of both properties sold No. 1 to plaintiff and No. 2 to defendant. The plaintiff continued to occupy No. 1 as his dwelling-house. The defendant afterwards built a shop on the garden in front of his house 24ft. long, 17ft. wide, and 11ft. high, and the plaintiff now brings an action for the damage he has sustained thereby. The substantial ground of action is the loss of light. The expert evidence called on behalf of the plaintiff showed that rather more than half the window was affected by the shadow thrown by the wall, which would appreciably darken even the middle of the room. For the defendant it was urged that the obstruction was lateral and only affected a small portion of a single window, and it was suggested that the room would be light enough if the curtains were removed. The expert evidence for the defence denied anything like a substantial diminution of light. One witness called it very immaterial, another said there was theoretically a slight obstruction but practically none, a third characterised the whole as “rubbish.” After viewing the premises, and after hearing the evidence on both sides, my opinion was that though the obstruction is lateral only, still there is an appreciable diminution of light, and that the house is distinctly less commodious than it was. Mr. Wagborne, for defendant, submitted several points of law. The fact that the properties were formerly held by one owner does not affect the question—there is no difference in principle between the case of a contemporaneous sale by a common owner of a house and land to one person and an adjoining house and land to another person, and the case of a sale of a house to one and of the adjoining land to another. In neither case is the purchaser of the land, whether with or without a house upon it, entitled to build so as to obstruct the ancient lights of the adjacent house. I do not lose sight of the fact that the plaintiff only paid £230 for his house and garden, and I assess the damages at £30.

CONCRETE BEDS AND THE BUILDING ACT.—At Lambeth police court on Tuesday, Charles Watts, builder, Lower Kennington-lane, appeared in answer to five summonses issued by Mr. Ellis Marsland, M.S.A., district surveyor for Camberwell, for having, in the construction of some houses in Worlingham-road, East Dulwich, covered the site with other than a layer of good concrete at least 6in. in thickness. Mr. Biron, the magistrate, who had personally visited the houses, pointed out to the defendant that the material used had been very imperfectly mixed, and did not conform to the requirements of the Building Act, which required that the material should be absolutely impervious to moisture. The defendant said he was ready to carry out the work to the satisfaction of the district surveyor. Mr. Biron said that upon that understanding he would only impose a nominal penalty. He ordered the defendant to pay a fine of 20s. and 2s. costs on the first summons, and a fine of 1s. and 2s. costs on each of the other summonses.

LIABILITY FOR BAD DRAINAGE.—At the Clerkenwell county court on Tuesday, before Judge Eddis and a jury, Lancelot Hoskins, of 91, Corbyn-street, Upper Holloway, sued Mrs. Corfield, of 90, Atlantic-road, Brixton, for £13 10s. damages for misrepresentation as to the sanitary condition of 91, Corbyn-street. From the plaintiff's evidence it appeared that in 1891 plaintiff became tenant of 91, Corbyn-street, the property of the defendant, who assured him it was in a perfectly sanitary condition. A fortnight later he detected bad smells in the house, and a day or two later one of his children suffered from gastric derangement, caused, the doctor said, by sewage gas. Walter Ward, sanitary inspector in the employment of the Islington Vestry, proved the

faulty condition of the drainage. It was pointed out by the Judge that unless the statements made by the defendant to the plaintiff were dishonest—unless she, knowing that the drains were defective, said they were not—the plaintiff's case must fail.—The jury found a verdict for the plaintiff for the amount claimed, and costs.

RE CHRISTOPHER EVERARD.—The debtor, a builder, carrying on business at Stratford, recently filed his petition, and in the summary of his accounts the liability is returned at £3,315, of which £2,885 are unsecured, and the assets at £749. The debtor has been adjudged bankrupt. He attributes his failure entirely to loss in respect of a contract for the erection of the Victoria and Albert Dwellings in South Lambeth-road, his loss whereby he estimates to have amounted in all to about £2,700.

IN RE W. ROBERTS.—A receiving order has been made against William Roberts and Robert Percy Nugent, carrying on business as builders at 95, Little Cadogan-place, Chelsea, under the style of “William Roberts.” The debtors return their liabilities at £6,283, of which £4,773 are unsecured, with estimated assets £1,736, and a deficiency of £3,093 is anticipated. The debtors commenced business in April, 1889, with £500 capital, contributed by the debtor Nugent, to whom that amount was lent by his father. Mr. Nugent, sen., is treated in the statement of affairs as a creditor for £2,265, exclusive of the £500. They assert that, apart from their ordinary business, they have incurred heavy losses in connection with speculations in the purchase of resale and leasehold property. The assistant official receiver states that the books do not sufficiently disclose their business transactions or their financial position at any time.

COMMISSION FOR SALE BY PRIVATE CONTRACT.—LIELL v. BOULTER.—In this case, heard at Bow County Court on the 14th inst., plaintiff is an auctioneer and defendant a builder, of Romford-road, Stratford. The claim was £49 on account of commission. In September last plaintiff was employed by defendant to sell by auction seven houses in Skelton-road, Forest Gate. The commission was to be 2 per cent. The sale was attempted, but the property not disposed of. Subsequently, in February the houses were sold by private contract to Mr. Samuel Jones, of Stratford, for £2,450. On this amount plaintiff now claimed 2 per cent. The questions before the jury were three in number. First, was plaintiff engaged to dispose of the property by private contract? Secondly, had the purchase by Mr. Jones been brought about through the instrumentality of plaintiff? Thirdly, what was the amount plaintiff was entitled to claim, if any? The jury found a verdict for the plaintiff for £30. His Honour gave judgment for the amount, with costs.

CHIPS.

The Dore and Chinley Railway, to connect Sheffield with Manchester by an easy route on the Midland, will be opened in June next. A great engineering feat has been accomplished in the construction of the Totley Tunnel, which is 3½ miles long, without a single air shaft. The new line will cost £1,000,000.

Sewerage works are about to be carried out at Totland Bay for the Isle of Wight rural sanitary works. Mr. Lidstone is the engineer, and the contract has been taken by Messrs. Trowsdale and Co. at £4,050.

On Thursday in last week a new church, just completed for the Wesleyan body at St. Anne's-on-the-Sea at a cost of £4,200, was opened for worship. The style is Decorated Gothic, and the building has a lofty spire, which will be a landmark for the whole district. The church, which is built of Yorkshire pitch-faced stone, with roofs of Westmorland green slate and red ridge tiles, consists of nave and chancel, with very slightly developed transepts, and an east gallery, the seating accommodation being for 490 persons. There is also an organ chamber, a choir vestry, and a minister's vestry.

A stained-glass window, erected as a memorial of the late Right Hon. Henry Cecil Raikes, Postmaster-General, has been placed in the side of the south transept of Chester Cathedral. The window, which has been subscribed for by residents in Chester and the county, bears the four figures of St. Chad, St. Martin, St. Anselm, and St. Asaph, with scenes connected with the lives of these saints.

The ancient church of Carlton-in-Lindrick, Work-sop, which seems to have consisted originally of tower, nave, and chancel, with aisles, has been restored at a cost of £900. Mr. Charles Green, of Rotherham, was the contractor. The reopening services took place on Saturday, with the Suffragan Bishop of Derby as preacher.

The parish church of Bretforton, in the Vale of Evesham, was opened on Saturday on the completion of internal restoration carried out by Mr. Alfred Crisp, a local builder.

Our Office Table.

A SERIES of lectures on art, delivered under the auspices of the Corporation of Glasgow, was inaugurated at the Corporation Galleries in that city on Saturday evening. Bailie Bilsland presided, and there was a crowded attendance. Mr. John M. Gray, curator of the National Portrait Gallery, Edinburgh, gave the opening lecture, his subject being "Sir Henry Raeburn and Portraiture in Scotland." In the course of his paper Mr. Gray traced the rise of Scottish portraiture, and exhibited photographs showing examples of the earlier masters. Referring to Raeburn, he said that that artist in some respects was fit to rank with the masters of the olden time. He was, however, a good-natured, genial man of the world, who did not allow art to absorb his whole attention. Raeburn was a great painter, one felt, but a great painter who might easily have been greater. At the same time, the only Scottish painter fit to be mentioned in the same breath with him was David Wilkie.

A SUGGESTIVE anecdote illustrating the extent to which protection of native labour is carried in the Eastern States is told in the *New York Sun* concerning an artist, a member of the National Academy of Design, who had undertaken the decoration of a private residence. He engaged a fellow-artist and Academician to paint pictures on the walls of one of the rooms. While this painter was at his task a walking-delegate came up to him, and this colloquy occurred: "Do you belong to the union?" "What union?" "The fresco-painters' union." "No; I am not a fresco-painter—I am an artist." "Well, if you don't join the union, I shall order out every man at work in the house." Under that threat, and for the sake of his fellow-artist who had given him the commission, the artist was forced to join the union, pay the dues, and put himself under the authority of the walking-delegate as an artisan!

THE London County Council have applied to the Home Secretary, under section 12, subsections 3 and 5, of the Housing of the Working Classes Act, 1890, for permission to erect artisans' dwellings on the vacant plot of land on the Goldsmith-square site, suitable for the accommodation of the people displaced by the carrying out of the Boundary-street scheme. The Act provides that the Council may engage with any body of trustees, society, or persons to carry the scheme for the erection of dwelling-houses into effect, but the Council itself may not, without the express approval of the Home Secretary, undertake the rebuilding of houses. If sanction is obtained, specifications and estimates will be submitted, and thereafter building operations will be proceeded with. The Council must in terms of the Act sell and dispose of all such dwellings within ten years from the time of their completion.

TEN years ago, according to a Government return just published, the woodland surface of Great Britain was computed at 2,458,000 acres. By 1888 the acreage thus occupied had risen to 2,561,000 acres, and the measurements taken in 1891 show a further advance to 2,695,000 acres. Of the 134,000 acres thus added to the approximate woodland area of Great Britain, 96,000 acres are assigned to England, 31,000 acres to Scotland, and 7,000 acres to Wales. The largest woodland area to be found in England is the county of Hampshire, with 122,574 acres; Sussex with 122,073 acres, comes second; while the four counties of Hants, Sussex, Surrey, and Kent possess between them nearly a fourth of the English woods and plantations. These four counties have upwards of 11 per cent. of their surface thus occupied. In Scotland, Inverness-shire has no less than 169,000 acres of woodland, that being the largest area of woodland in Great Britain.

In conjunction with the Sanitary Institute, the Carpenters' Company have arranged a course of six lectures, specially adapted for candidates preparing for the examinations in practical sanitation and building construction, to be given in the hall of the company, London-wall, at 8 p.m. on November 18, 23, 25, and 30, and on December 2 and 7. The examinations are intended to be suitable for clerks of works, builders' foremen, and others who have to deal with the construction of buildings. Each

examination will occupy part of a Friday and Saturday. On the Friday the examination will last four hours—from 5 to 7 p.m. and from 7.50 to 9.30 p.m., and consist of written papers only. On the Saturday the examination will commence at 3 p.m., and be *viva voce*, with one or more questions to be answered in writing, if deemed necessary. No one under 21 years of age will be admitted to the examination. The first of the six lectures mentioned will be by Sir Douglas Galton, and the others will be delivered by Professor H. Robinson, Professor Banister Fletcher, Professor W. H. Corfield, Professor T. Roger Smith, and Mr. Henry Law.

ON Saturday last an examination of plumbers in the practice and theory of their craft was held in the Technical School, Manchester, with a view to testing the fitness of the candidates to receive the certificate of the Worshipful Company of Plumbers. The examiners present included Mr. John Holden, F.R.I.B.A., president of the Manchester District Council, and as representing the Worshipful Plumbers' Company; Mr. G. B. Davis, R.P., and Mr. Fred Scott, secretary. The practical test consisted in working up a 4in. break with inner and outer angles in 6lb. sheet lead, joining a piece of bent 2in. pipe into a piece of 4in. pipe, and an underhand soldered joint of two pieces of 3in. pipe. Time allowed 3½ hours. The written work consisted in answering ten questions supplied by the Plumbers' Company relating to the nature and uses of materials dealt with, the theory of hot and cold water circulation, the action of water and acids on lead, &c., some technical terms, choice of sanitary appliances, &c. There were 17 candidates in attendance, and out of these 13 satisfied the examiners, who stated that the average efficiency was much higher than usual.

The Architectural Association, 9, Conduit Street, W.; and 58, Great Marlborough Street, W.

THE ARCHITECTURAL ASSOCIATION COURSES OF LECTURES, CLASSES, and STUDIO INSTRUCTION are now commencing.

The Courses are both Elementary and Advanced, and are designed to provide a sound professional education, supplementary to that to be obtained by the prevailing system of pupillage. The Course, which is in four divisions, is progressive and consecutive, and the instruction is given by Lecturers and Instructors of known ability.

DIVISION I.

LECTURES and CLASSES.—The Orders of Greek and Roman Architecture, Building Materials, Perspective, Physics.

THE STUDIO.—Drawing from Ancient Examples, Freehand Drawing, Drawings of Examples of Elementary Construction, Plane Geometry, Criticism Meetings.

DIVISION II.

LECTURES and CLASSES.—English Architecture, Materials, Elements of Ornament and Colour Decoration, Strength of Materials, Stresses and Strains.

THE STUDIO.—Designs based upon Ancient Examples, Freehand Drawing, Drawings of Examples of Elementary Construction, Solid Geometry, Criticism Meetings.

DIVISION III.

LECTURES and CLASSES.—The History of Architecture, Materials, Colour Decoration, Sanitary Science as applied to Drainage and Water Supply.

THE STUDIO.—The Design and Construction of Modern Buildings, Freehand Drawing from Casts, Perspective and Sciography, Constructive Masonry, Criticism Meetings.

DIVISION IV.

LECTURES and CLASSES.—The History of Architecture; Sanitary Science—including Ventilation, Lighting and Heating, Painting, Sculpture; other Arts allied to Architecture; Professional Practice—including Legislative Enactments relating to Building Contracts.

THE STUDIO.—The Design and Construction of Modern Buildings, Freehand Drawing from Casts, Drawings of Ancient Buildings from actual measurement, Graphic Statics and Perspective, Criticism Meetings.

EXTRA SUBJECTS.

LECTURES and CLASSES.—Plane and Solid Geometry, Geology, Mensuration, Land Surveying and Levelling, Chemistry of Building Materials, Quantity Surveying—including the Preparation of Estimates, Discussion Section.

THE STUDIO.—Sketching and Measuring, Elementary Water Colour Class, Water Colour Class, Modelling.

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ERNEST S. GALE,
P. T. W. GOLDSMITH, } Hon. Secs.

The ceremony of laying the memorial stone commemorating the restoration of Dunblane Cathedral was performed on Friday by the Grand Master Mason of Scotland, the Earl of Haddington. The work of restoration has occupied three years. The nave, which stood roofless for 300 years, is now fitted to seat a congregation, and is lighted and heated. The work has cost £26,000. The architect is Dr. Rowand Anderson, of Edinburgh.

The work of founding a new watering-place between Lytham and St. Anne's, to be called "Fairhaven," is rapidly progressing. There are to be 15 streets and a marine lake 2½ miles long. Most of the former are within St. Anne's local board district, and three-fourths of the lake will be within the boundary of the Lytham Commissioners. The carriage drive will be 60ft. wide, and the footway 12ft. wide, besides which there will be an outer carriage drive formed on the Stanner Bank.

Trade News.

WAGES MOVEMENTS.

THE LONDON SCHOOL BOARD AND CONTRACTORS.—At the last meeting of the London School Board a deputation from the London Building Trades Committee waited upon the Board to present a memorial having reference to the conditions of the contracts entered into by the Board. Mr. Daw (secretary), who headed the deputation, stated that they represented the whole of the building industries of London. They wished the Board to consider the advisability of amending the fair contracts resolution made by the late Board to read as follows:—"That all contractors shall be required to sign a declaration that they are prepared to pay their workmen the recognised rates of wages, and to strictly observe the recognised rules and customs which prevail in the various trades as to the hours of labour." They asked the Board to prohibit subletting and piecework, and suggested when possible all labour should be employed direct from the Board without the intervention of a contractor. The members of the deputation answered a number of questions, and the memorial was then referred to the Works Committee.

DIRECT TENDERING BY TRADES UNIONS.—A special meeting, convened by the Street Masons, Paviers, Stone Dressers, and Hammermen's Amalgamated Union, was held on Monday at the Crown, Clerkenwell-green, to consider whether the Union should tender for the paving work of the Rotherhithe vestry. The chair was occupied by Mr. J. Madden, who explained that the Union had been invited to tender for the work by the vestry officials, the latter agreeing, in the event of the Union's tender being successful, to advance money from week to week to enable them to carry on the work. In the discussion which followed, attention was drawn to the co-operative quarries in Scotland, which are being worked by a Union very successfully. It was unanimously decided to tender for and undertake the work.

Among the adjudications in bankruptcy announced in Friday's *Gazette*, the name appears of Alfred Hood, of Bethnal-Green-road, builder and contractor.

In the case of Benjamin Beesley Booth, of Norton Woodseats, Derbyshire, builder, contractor, brick manufacturer, and quarry owner, trading with William Camm Wilson as Wilson and Booth, the discharge from bankruptcy has been refused.

A stained-glass window, designed and executed by Mr. C. E. Kempe, of London, has been placed at the end of the chancel of the North Luffenham church. The scenes represented are the Crucifixion of our Lord and the principal events of St. John Baptist, the patron saint of the church.

The first annual dinner of the recently-formed Rugby Building Trades Council was held last week in a local hall under the chairmanship of Mr. J. MacGawley, the president.

Stenton parish church, N.B., was reopened on Sunday, after restoration. The church, which is a Gothic edifice, with tower, was erected in 1829 from designs by Burn, and was opened in that year by Dr. Chalmers. The pulpit has been removed to the south-west corner, the pews have been lowered and widened, the walls repainted, and the whole congregation now facing the minister. On the platform are placed the Communion table, font, and lectern, as also the harmonium. A stained-glass window has been placed in the north side of the church, and the other windows have been filled with tinted glass, all having been executed by Messrs. A. Ballantine and Gardiner, Edinburgh. The architect was Mr. James Jerdan, George-street, Edinburgh.

The Khedive opened, at Alexandria on Monday, the new museum of Græco-Roman and Early Christian Antiquities and the Municipal Library. These institutions have been founded, not only for scientific purposes, but also with the view to inducing tourists passing through the city to make a short stay there.

Mr. Somers Clarke, F.S.A., is the architect of the chancel of the Parish Church, Brighton, and the works are about to recommence forthwith. The foundations and crypt cost over £3,200, and the structure has been at a standstill for some time owing to want of funds. The church, formerly known as St. Peter's, was a famous building in its day as the design of Sir Charles Barry, R.A.

The Rural Sanitary Authority at Barton, Manchester, have decided to make application to the Local Government Board for sanction to borrow £16,500, to be repaid in 40 years, for works of main drainage and sewage disposal at Irlam and Cadishead. For the present it is proposed to execute works estimated to cost £10,194. The scheme has been prepared by Mr. C. C. Hooley, C.E., surveyor to the authority.

CHIPS.

The Derbyshire County Council have increased the salary of Mr. R. C. Cordon, their district surveyor for Mid-Derbyshire, from £130 to £150 per annum.

Alterations have been made to Ballybot Court-House, Ireland, and special attention has been paid to the ventilation, the extraction of the vitiated air being effected by Messrs. Robert Boyle and Sons' latest improved patent self-acting air-pump ventilator.

The spire of St. Barnabas's Church, Parliament-street, Liverpool, being in a dangerous condition, is being taken down by Mr. T. C. Ebdy, of North John-street, the architect to the trustees. The whole church is shortly coming down, and the stone and material will be used in building a church in the Anfield district, to accommodate about 700 persons.

At Dundee the operative plumbers have threatened to withdraw from the practical plumbing class established by the Technical Institute unless the names of three young men, described as tinsmiths, be taken off the roll. They claim that none but qualified plumbers or plumbers' apprentices shall be admitted to avail themselves of the classes.

The Baptist chapel at Elenbridge, Kent, was reopened on Wednesday week after enlargement, the erection of a new frontage, and external decoration. Mr. Hooper was the architect, and Mr. Abbott the builder.

The North Bierley Joint Fever Hospital was formally opened on Saturday. The hospital is for the use of the inhabitants of the local board districts of Cleckheaton, Hunsworth, North Bierley, and Tong. The district is 9,769 acres in extent, and the population is 42,299. The buildings comprise an administrative block; a ward pavilion, with twelve beds and six cots; an isolation block, with ten beds and four cots, besides wash-houses and sheds.

The new schools of the Hebburn School Board are being ventilated on the Baird-Thompson system, their latest improved exhaust roof ventilators and air inlet ventilators being introduced throughout. The same is also being applied to the Oldham schools.

On Friday Colonel Ducat, R.E., Local Government Board inspector, held an inquiry at the Town hall, Tamworth, with respect to applications by the town council for a loan of £1,000 for street improvements, and by the urban and rural sanitary authorities for a joint loan of £2,250 for the purchase of the Castle Mill and its weirs, to prevent flooding.

The new buildings erected by the Glasgow Workmen's Dwellings Company, Limited, at Cathedral Court, Rotten-row, near the corner of High-street, were publicly opened on the 12th inst. by the chairman of the company, Sir James King. This is an experiment block of model dwellings for the working classes, erected from the designs and under the supervision of Mr. John James Burnet (of Messrs. John Burnet, Son, and Campbell, architects), at a cost of about £8,000.

On Saturday last Mr. W. Terrill, late assistant borough surveyor of Maidstone, who was some time ago appointed surveyor to the local board of Ashford, was presented at the New Inn Hotel, Maidstone, with an ivory pocket rule and a pair of compasses, together with an illuminated address, by Mr. Scoones, borough surveyor, on behalf of the employés of the Maidstone Corporation.

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TENDERS.

* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

ASHBURTON.—For sundry alterations and renovations to the Congregational Church, Ashburton. Messrs. G. S. Bridgman, M.S.A., and Norman G. Bridgman, A.R.I.B.A., Torquay and Paignton, architects:—
Pomroy, J. Ashburton £230 0 0

ASTON, BIRMINGHAM.—For the remaking of Rockylane, and the reconstruction of the bridge over the canal, for the Aston local board:—
Jones and Fitzmaurice (accepted) ... £3,052 0 0

BEDMINSTER, BRISTOL.—For alterations and additions to Whitehouse-street Tannery, Bedminster, for Messrs. Parker Bros. Limited. Mr. Herbert J. Jones, architect:—
Perrott, J. £1,815 0 0
Bastow, J. 1,900 0 0
Cowlin and Son 1,892 0 0
Church, W. 1,740 0 0
Gay, E. 1,707 13 0
Wilkins, G. H. 1,690 0 0
Eastbrook and Son (accepted) ... 1,670 0 0

BANSTEAD.—For building detached house at Banstead, Surrey. Mr. Frederick W. Ledger, 3, Lombard-court, E.C., architect. Mr. William Burrell, 9, Adam-street, Adelphi, W.C., surveyor:—

Woodward	£2,290 0 0
Bryant and Son	2,175 0 0
Smith, J.	2,047 0 0
Notley, W.	2,020 0 0
Gregory	2,000 0 0
Potter	1,995 0 0
Nightingale, B. E.	1,985 0 0
Mills	1,956 0 0
Adams	1,933 0 0
Reynolds	1,876 0 0
Taylor, M.	1,807 0 0

BERMONDSEY, S.E.—For providing new hot-water apparatus at the Rolls-road School, Bermondsey, for the London School Board:—

Cannon, W. G.	£399 0 0
Crane, R.	388 0 0
May, J. and F.	353 0 0
Davis, G.	347 0 0
Russell and Co.	339 0 0
Purcell and Nobbs	337 0 0
Bacon and Co.	309 10 0
Kinnell, C. F., and Co., Southwark-street, S.E. (accepted)	275 0 0

BERMONDSEY, S.E.—For reconstructing the drains at Alexis-street School, Bermondsey, for the London School Board:—

Goad, W. V.	£1,250 0 0
Tyerman, J.	1,100 0 0
Marsland, J.	1,025 0 0
Holloway Brothers	920 0 0
Smith, J., and Sons	895 0 0
Whitehead, L., and Co.	895 0 0
Downs, W.	855 0 0
Leeks and Hooker, Webber row, S.E. (accepted)	776 0 0

BRISTOL.—For the erection of the central electric lighting station and chimney stack for the city council:—
Hayes, C. A., Bristol (accepted) ... £13,346 0 0

BRIXHAM, S. DEVON.—For the erection of two shops and dwelling-houses, The Beach, Brixham. Mr. G. S. Bridgman, M.S.A., and Norman G. Bridgman, A.R.I.B.A., Torquay and Paignton, architects:—
Hosgood and Spark Brixham ... £577 0 0

CHELSEA, S.W.—For providing a new main and six additional radiators on the top floor of the girls' department of the Everington-street school, for the London School Board:—

Fraser, J., and Son	£145 12 0
Cannon, W. G.	90 0 0
Purcell and Nobbs	87 15 0
May, J. and F.	85 0 0
Berry and Sons, Regency-street, Westminster (accepted)	74 0 0
(Estimated cost, £95.)	

CLAPHAM JUNCTION, S.W.—For converting the private dwelling-house, No. 34, Northcote road, into a shop. Mr. M. V. Treleaven, Acre-lane, Brixton, architect and surveyor:—

Clarke	£523 0 0
Sommerford and Son	521 0 0
Maxwell, Limited	444 0 0
Sumner	442 0 0
Smart and Son	398 0 0
Rice and Son	375 0 0

CRADLEY HEATH.—For new house, Cradley Heath, Staffordshire, for Mr. John Fellows. Mr. A. T. Butler, architect:—

Cope, H., jun. (accepted)	£1,025 0 0
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DEPTFORD.—For taking down and rebuilding stables and granary at the rear of 103, High-street, Deptford, S.E., for Mr. Jas. Murray. Mr. John Jas. Downes, 11, The Parade, Lewisham High-road, S.E., architect:—

Soper, R.	£1,590 0 0
Wilson, A.	1,510 0 0
Leng, T. D.	1,138 0 0
Lorden, W. H., and Son	997 0 0
Best, S. R. (accepted)	924 10 0

DEPTFORD.—For repairs to Normandy Wharf, Ravensbourne-street, Deptford, S.E., for Mr. W. C. Mockford. Mr. John Jas. Downes, 11, The Parade, Lewisham High-road, S.E., architect:—

Wilson, A.	£195 15 0
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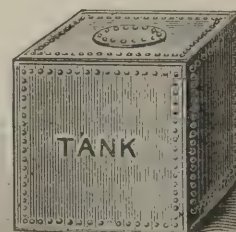
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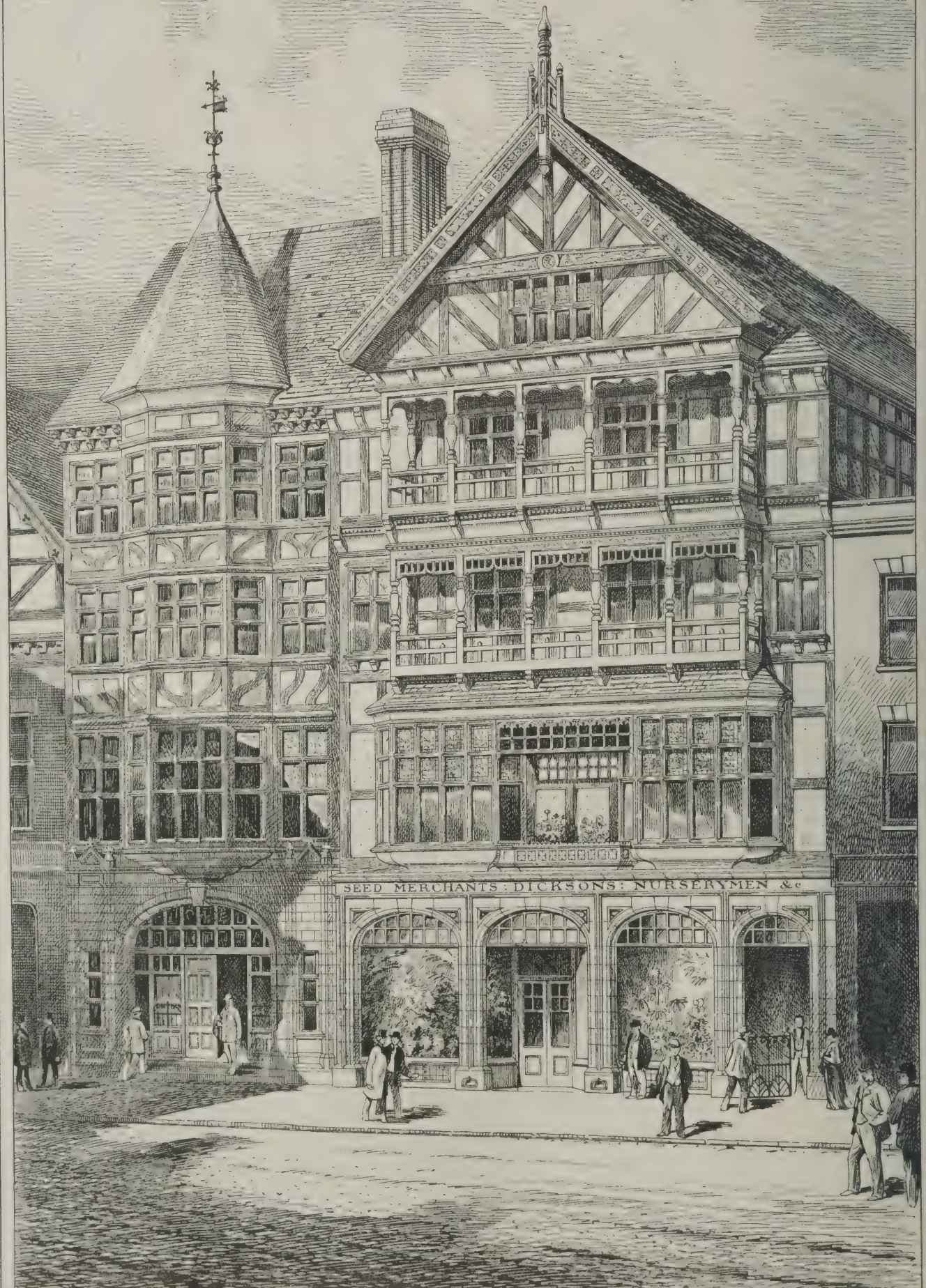
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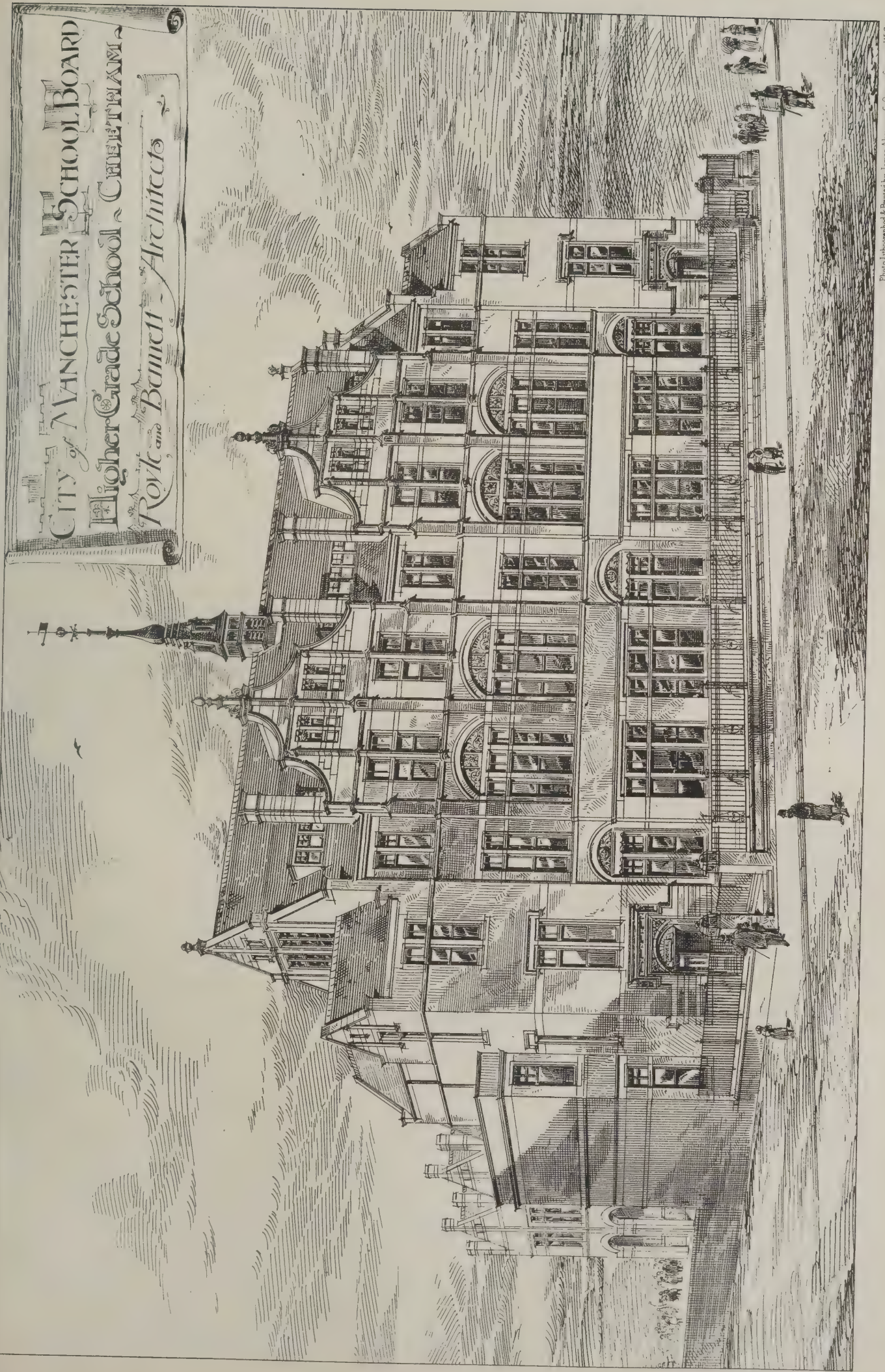
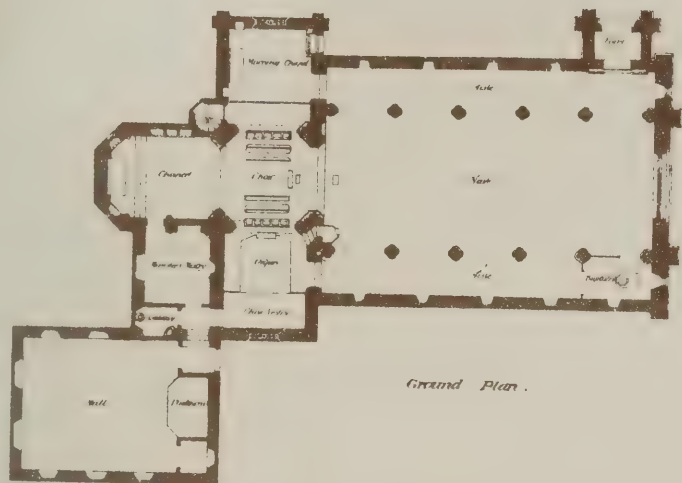
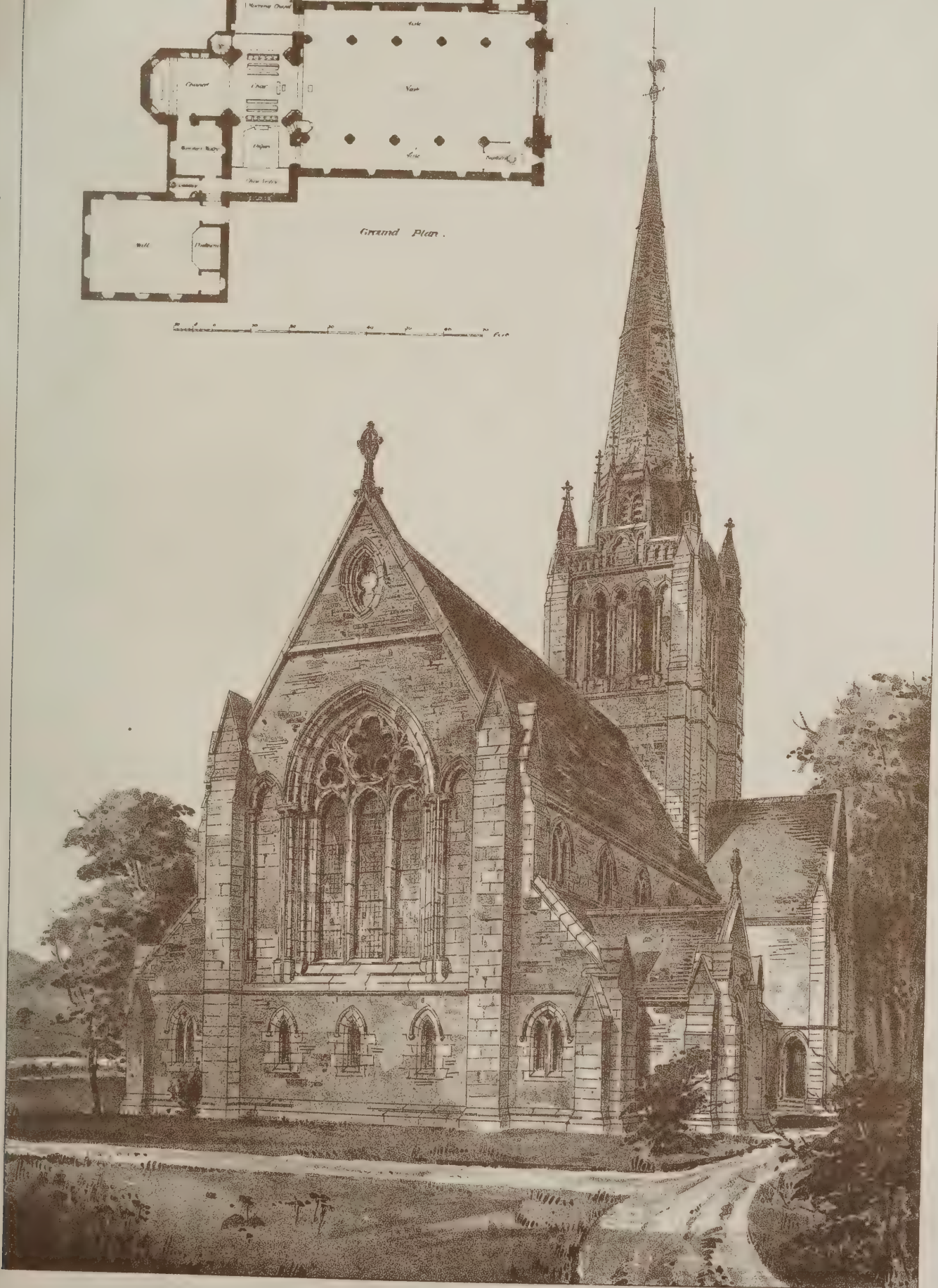


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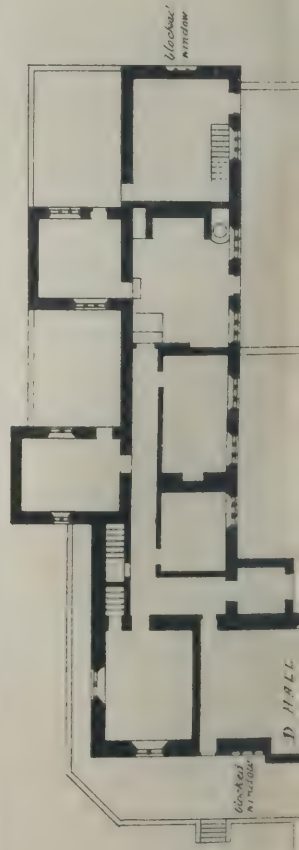
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Grand Plan.



MOTTISTON MANOR HOUSE.



PLAN



EAST ELEVATION



NORTH COURT.

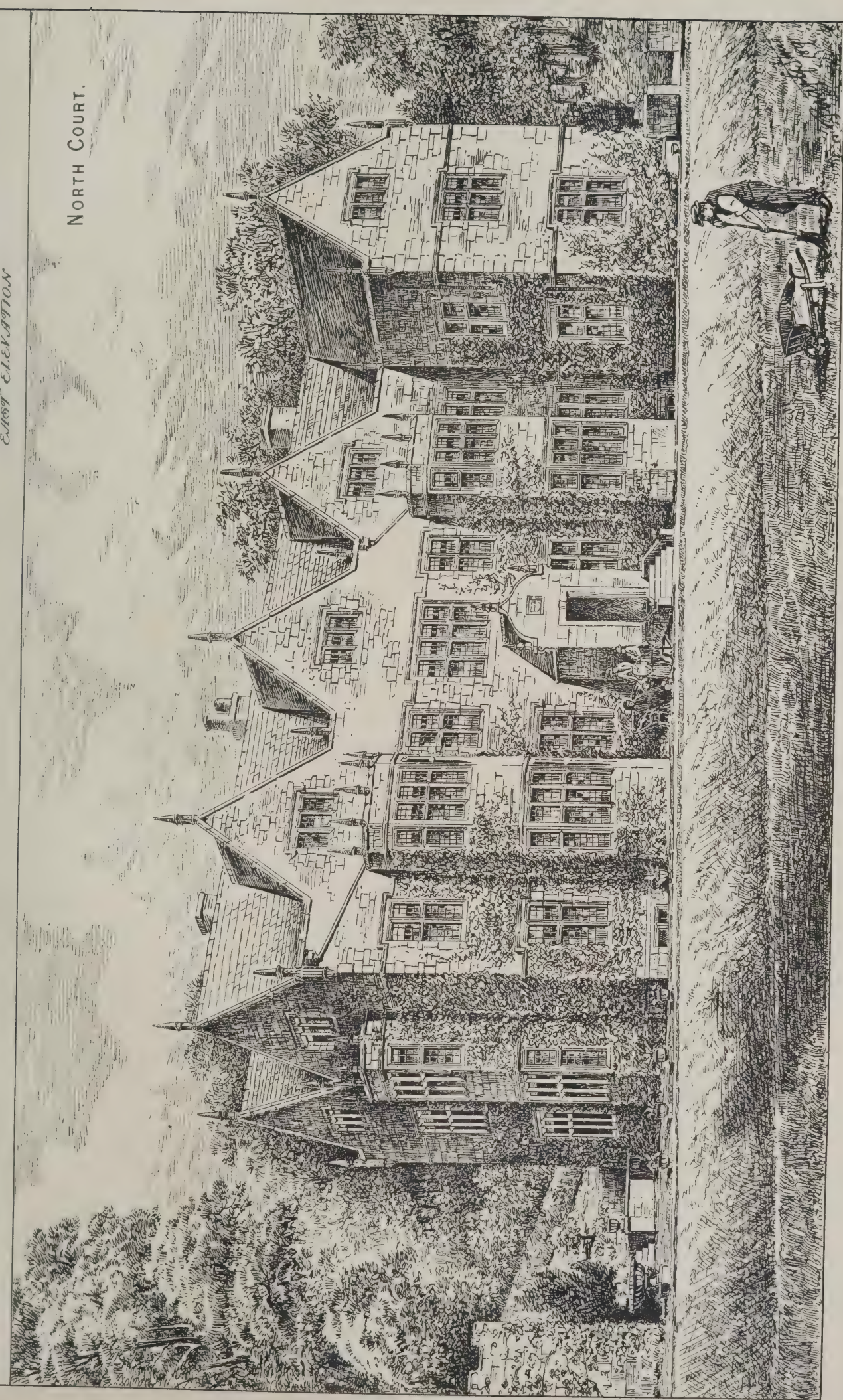


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EXAMPLES FROM "ARCHITECTURAL ANTIQUITIES OF THE ISLE OF WIGHT" BY PERCY G. STONE, F.R.I.B.A.



Oct. 21, 1892.



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WALTER HENSMAN.

THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1973.

FRIDAY, OCTOBER 28, 1892.

SHOULD ARCHITECTS TAKE OUT THEIR OWN QUANTITIES?

ALTHOUGH this question has been frequently the subject of controversy in these columns, no general agreement has been come to. A large number of architects in provincial towns, as well as in London, still contend that the practice of taking-out quantities for their own work is justified by various considerations of a practical kind: First, that an architect being the designer, knows better than anyone else the requirements of a given building, that he alone is competent to decide what should be included in the items submitted to the contractor, and that, being master of the situation, he is able to determine how much or how little of certain materials should be used, and the mode of measurement to be adopted. Moreover, as he is to be judge of the work, and has to determine its construction, it is argued that the employment of a surveyor, who has to obtain his instructions from the architect, cannot possibly facilitate the business, but must rather cause unnecessary friction. These are reasons which appear to weigh considerably against the objections raised on the other side—namely, that an architect should be entirely free from any participation in the commercial part of the contract, and that he ought to hold himself independent of any obligation to the builder. We do not underrate the force of either of these contentions. Recent discussions that have taken place in the profession as to what constitutes the qualifications of an architect have unquestionably aggravated the situation by increasing the breach between the architect and surveyor.

For many years the two professions have lived in harmonious union—whether the happiest or not we will not say. But of late the apple of discord has been thrown amongst them; the term “business architect” has been flung as a reproach against all those who have been making a remunerative living by taking up surveying work. The functions and duties of the surveyor have become more definite, the Institution of Surveyors have been increasing and strengthening their bonds of membership, and in various ways the unity of the two professions have been destroyed. It was almost natural that this rupture should take place. A process of disintegration, which will end no one knows where, has been going on. On the other side we have those who make the claim of art paramount, and who steadfastly refuse to believe that architecture can in any way be joined to businesses that had never till lately had any connection with her. The very name of “profession” they abhor. We may call the reader's attention to the recent book of essays edited by Mr. T. G. Jackson, A.R.A., and Mr. Norman Shaw, R.A., to show the strong and growing feeling among architects to dissociate themselves from those who combine a variety of vocations, and who employ a large staff of assistants. Mr. Jackson draws attention to the ordinary professional architect “who does not meddle much with art, but acts as a middleman between his employers and the carver, the glass painter, and other working artists whose ideas he adopts as his own.” The architect who undertakes quantities and makes valuations of property is likewise tempted to make his professed art a secondary matter, and to confine his attention to that branch which pays the best. All this is reprehensible. We have before now

referred to architects who obtain their designs of woodwork and fittings from special artists and make them their own, or who use trade-catalogue designs instead of making details. Now, the man who prepares his own quantities must naturally have a strong inducement to adopt stock patterns, or to take what the wood or metal-worker gives him. The idea of reducing cost is ever before him, and he is glad to consult the artist-craftsman as to how any part of the details and fittings of a building may be cut down. Quantities, no doubt, have much to answer for the “Ghosts of the Profession,” which Mr. Prior has essayed about. They have been conjured up and requisitioned by men who find “quantities” more lucrative than art.

The preparation of quantities by an architect has no doubt other tendencies calculated to prejudice architectural design, as for example in the system of repetition and duplication of features and details. A man who designs a building and has the “quantities” staring him in the face is more likely to use the greatest care in avoiding expensive features and in arranging his details so that his windows, and cornices, and dressings may agree. To take one example of a building in which the windows are constructed of terracotta. They may be a number of bay windows of ornamental character. The art architect, independent of cost considerations, would design each, and its details, with relation to the position or connection with other features. The details at least would vary: one window might be wide, another narrow; the mullions would be differently spaced to suit the rooms or to give variety to the façade. The relief or enriched panels would be varied, and the mouldings would be different; but the practitioner who took out his own quantities would most likely make the bay windows the same in projection, width, and detail to save modelling, and each piece measured per foot cube would be numbered in the bill according to the number of windows. The advantage of this, both in “taking out” the quantities as well as in saving cost and labour in setting, would be very evident, though the design would undoubtedly lose in its individuality and artistic variety. The same inclination to repeat one design of panel, or moulding, or internal fitting is one of the strongest of the motives of the expert quantity surveyor. It saves an immense amount of labour in measuring, abstracting, and billing, and in cost of execution as well.

The last advantage is one of the strongest pleas put forth by those who think that quantity taking is a duty of the architect. He is less likely to be extravagant by cutting down what is unnecessary. But may not this very process be carried too far? May it not lead to a kind of cheese-paring economy inimical to good architecture? Has it not been the cause of that skin-deep sort of ornament which passes muster for art, the overlaying a plain and irredeemably bad building with just a thin veneer of pilasters, panels, and dressings?

The practice of taking out quantities—a lucrative one amongst many provincial practitioners—is also, no doubt, detrimental to the independence which the architect should have as an arbitrator; but this is a point on which we need not dwell here. It is rather more the question of forming another division within the profession that we have in view. There is a strong integrating action going on which the profession ought to watch. Some of the leaders of that profession can very well see the drift. It has been said lately that there is a tendency to develop the muscular part of the profession in the civil engineer, the lucrative, monetary part in the quantity surveyor, while the architect proper will be left to pick up what he can. Legislative measures, it is said, will encourage this disintegration or division. We answer that it exists now in

a more pronounced form than it would if there was a bond uniting the qualifications. The intelligent, discerning part of the public know where they can obtain the services of a real architect—one who knows how to design artistically—he is known by repute; whereas the others fall by a sort of “natural selection” into their places as surveyors or technical experts, and to a large degree this kind of separation or segregation will always exist in every profession. There will always be those who take up wrong vocations, and who find some one branch more remunerative than another. So it is with many who join the business of quantity-taking to that of architecture; they find it pays better, but they unfortunately expose themselves to the retort that their architecture is of a somewhat feeble and indifferent kind.

OPENINGS FOR THE ART-WORKMAN.

IF there is one thing beyond all others which we do not mean by the art-workman, it is the mere ornamentist. There have been too many openings for him already, and he has availed himself of them a great deal too much. It is the very misery of the age that the infinity of ugliness it produces is not the naïve, unaffected ugliness of work done to supply pressing practical wants; too pressing to let the worker look beyond them. It is an ugliness dressed up, tricked out, and emphasised by trashy decoration: an ugliness which cannot lie quiet, but which shouts and screams for all the world to look at it. Such ugliness as this one can never, in these days, keep far away from. The city streets are full of it; in the suburbs it stares from every house, and, worst of all, there is no escaping it, even in one's home. How much longer shall we have to bear it? When will the artist come?—when will the ornamentist go?

Things have come to such a pass that in some trades nothing can be bought without ornament except at a high price as a special luxury. Try, for instance, to buy a cheap stove fit for a cottage. You choose the plainest pattern you can see, and find it twice or thrice as dear as, for practical purposes, it need be. You ask for something less expensive, and you are shown a dozen alternative designs, hideous in form, but covered with ornament like a cutaneous eruption. In shape they would disgrace the lowest savage; but in decoration they seek to vie with the richest of Classic and Renaissance architecture. One moulding is cut up into eggs and tongues; another is formed into a *guilloche*, the rest are covered with carvings, or rather, castings, equally ambitious, for which the ironfounder only can supply a name. Acanthus-leaves diversify the flat surfaces, and pleasingly combine with Gothic diapers, taken, perhaps, from Westminster Abbey. That is the popular notion of a cheap stove. That is a result—though, happily, not the only or the highest result—of Government art-education, carried on for nearly half a century. We do not forget such schools of art as the Lambeth one, which has invented new types of design, and has turned out work as genuine as that of any age or any nation. But it is to the inferior schools of art, and to inferior pupils at the good ones, that we owe a multitude of the “ornamental” abominations of the period. A young man enters them; he sees his fellows all employed on drawing ornament, modelling ornament, designing ornament; and, unless his taste and judgment are above the average, he concludes that ornament is the one thing needful. Then he goes out into the world and applies it. He knows nothing about general form. He is incapable of shaping anything. All he can do is to cover the stock-shapes with ornament, as a whitewasher covers walls with whitewash. Having done this, he

thinks himself an artist; and his employer calls himself an art manufacturer.

Here, then, is an opening for the real art workman. Stoves are bought and sold every year by scores of thousands. A man with any taste or sense of fitness can hardly ever find a stove that does not disgust him, unless he pays a disproportionately high price for it. Except on those terms, he can get nothing that is plain, though he can get everything that is ugly. Why does not some one bring into the market a few designs of unpretending general form, free from attempts at "enrichment"? A village blacksmith, left to himself, could make a stove by which an artist would sit day after day without perpetually longing to smash it. Why cannot the caster of iron do something equally unobjectionable? Why cannot he also find out what shapes suit the nature of his material, and adopt them? Unfortunately, he has hardly begun to do this yet—or, to speak more exactly, he has long since forgotten the way.

If there is anywhere a person in blank ignorance of art, that person is the average ironfounder. Walk through Thames-street, and look at his productions! His pattern-books are an abomination, his show-room is a chamber of horrors; his life is passed in showing everyone who works in metal how not to do it. The forms he adopts belong to every material except his own. When he is very ambitious, he mimics the stonemason. Then he turns out cast-iron tracery, and cast-iron crockets, and cast-iron pinnacles; or he gives you a Corinthian capital, with the leaves cast separately, and stuck on for a little while, by pins or screws. In a humbler mood, he imitates the joiner. Now he offers you a grate with stop-chamfered bars, in which all the ends cross each other, as if they were halved together. But his chief delight is to copy the smith in his most characteristic effects. He prides himself especially on this, and offers you what he calls "the same thing at less money." If the smith hammers a scroll, he can cast one, and he can cast, also, an imitation of all the sharp angles and thin plates or leaves which are natural to wrought work, and absurd in any other. That is about as far as the ironfounder usually gets. He is a kind of art-parasite, living on other men's ideas, and unfortunately for himself on ideas that do not agree with him. Of late years his business has fallen off. His productions have grown a little too bad for an age which, by slow degrees, is getting back its sense of beauty, and the orders which used to go to him have gone to the wrought-iron worker instead. He thinks, poor man, that this is only a change of fashion. It does not occur to him that by any effort he could prevent it. He has tried aping masonry, and joinery, and smith's work, and he cannot see that there is anything further to be done. To develop art in cast metal itself is too wild a project for him to attempt. Here, then, is an opportunity for the art workman. Here is a great manufacture waiting for him to transform it—waiting, and perishing as it waits, because he does not come.

Let us turn to another trade—that of the marble-worker. There is only one common object of daily life whose ugliness quite matches that of the ordinary stove, and it happens to be the object that goes along with it—the mantelpiece. Years ago marble mantelpieces were used everywhere; but the marble mason, like the ironfounder, had not the wit to move with the times. His productions got worse, as public taste got better, and so popular support, to a great extent, has left him. His sham pilasters, made up of thin slabs put together like boxes, were too silly a fraud to last, his sham consoles, stuck with plaster to the shelf they pretended to support, were too ugly to bear interminable repetition. People like marble,

in the abstract, for mantelpieces, but there is a limit to their endurance when it is so basely misused. They have given it up, therefore, and have made shift with wood instead—or even with iron copies of wood—which, bad as they are, are yet less strikingly offensive than the marble worker's stock patterns. But they are ready to come back if they can get marble in sensible shapes, not boxed out into gigantic blocks which nobody believes in, not stop-chamfered into carpenters' Gothic, not disfigured with imitation trusses of hideous form, turned out wholesale by machinery. Here is another trade wasting away for want of the art which its tradesmen cannot see the value of. Here is another opportunity crying aloud for the art workman.

Look again at plastering—internal and external—not the plastering of some cleverly-designed house, arranged by a competent architect; but that of the myriads of builders' structures, over which no architect has any control. Compare it with the plastering of country cottages, done a century or two ago, and see what a fall has taken place in the interval. Then plaster was used like plaster, and, used so, it has a beauty of its own. Its projections were slight, its lines were delicate, its surfaces had some texture—it might be of rough-cast, it might be of par-getting. Its design suited the conditions, and the work was at once beautiful and durable. Now, although plenty of good cement can be had, and although this is a harder and more durable substance than the lime and sand of olden times, it does not last half as long, because it is made up into forms which are not natural or suitable to it. It aims at too much projection in its cornices; it cannot be content with patterns in low relief; it wants to do all that can be done in stonework. This is no new complaint. For fifty years and more the misuse of plaster has been a subject for architectural writers. But it is with the plasterers as it is with the ironfounders and the marble workers. They cannot improve; they only sit still and see their work pass away from them; they do not lift a finger to retain it. So it comes to pass that, just as wrought iron has superseded cast iron, and wood has superseded marble, brick and terracotta have superseded, and are superseding, plaster. There are places still where it might well be used, but only art can save it; and the people who are most concerned do not know what art is, or what it would be worth to them in money. Not only in the three departments we have here noted, but in fifty others of minor importance, fortune and reputation are crying aloud for someone to come and take them. The ornamentist cannot do it; the adventure is reserved for his mortal enemy, the true art-workman.

THE SOCIETY OF ARCHITECTS.

THE first ordinary meeting of the Society of Architects for the present session will be held at St. James's Hall on Tuesday afternoon, Nov. 15, at 3 o'clock, when the President, Mr. Robert Walker, of Cork, will deliver an inaugural address. In the evening the members will dine together at the Holborn Restaurant.

The annual report of the Council, which will be submitted at the ordinary meeting in the afternoon, states that steady progress is being made by the society. Thirty-five new members have been made during the session, after very careful investigation into their qualifications, and two gentlemen of distinction have been added to the list of honorary members. One member has died, and there have been eight retirements from various causes, leaving a net increase of 27. The annual excursion took place in August, 1891, when an extended tour was made in Belgium by a party of 42. During the session, an address and a paper were read by the President, Mr. W. H. Seth-Smith, and papers were also read by Messrs. G. A. T. Middleton (secretary), Wyke Baylis, R. O. Allsop, Professor J. Logan Lobley,

A. Hands, Ellis Marsland, W. L. Bros, Ernest Day, and Rev. J. E. Field. The Council met twenty-two times, the Finance Committee eight times, and the Practice Committee eight times during the session, the last named body considering and reporting to the Council upon several important questions raised by members in consequence of difficulties arising in their practice. Advice has thus been several times given which has proved of value. In January a sub-committee was appointed to consider the proposed London Building Law Consolidation Bill. This sub-committee has met ten times, and has drawn up an exhaustive report and a set of suggested amendments to the Bill. These were adopted by the members at the annual meeting in June. The Council have given their support to the Architects' Registration Bill, and regret that the early close of the Parliamentary Session should have caused further delay in its consideration by the House; but trust that the Registration Act Committee, which has it in hand, may succeed in bringing it to a second reading during next Parliament.

THE ARCHITECTURAL ASSOCIATION.

THE inaugural meeting for the present session of the Association was held on Friday evening, the President, Mr. H. O. Cresswell, in the chair. The adoption of the annual report and balance-sheet was moved by Mr. F. T. BAGGALLAY, ex-president, who said the result of the year's working of the new scheme was better than they had a right to expect. The motion was seconded by Mr. HAMPDEN W. PRATT, and agreed to. A cordial vote of thanks was passed to the entertainment committee, with especial mention by the President, who proposed the motion, of the services of Mr. A. W. Earle, the secretary, for the arrangements for the recent *conversazione* at the Imperial Institute. Forty-six nominations for membership were read, and the following three new members were elected: H. R. Macaulay, K. Oldham, and L. Banks Price.

PRIZE LIST.

The PRESIDENT then announced the winners of the prizes for last session as follows:

THE A. A. TRAVELLING STUDENTSHIP.—Bronze medal, T. A. Sladdin. Second prize of £5, E. A. Rickards.

THE ASSOCIATION MEDAL, with a Prize of £10 10s.—A. H. Clark. Second prize of £5 5s. (special), A. H. Moore. Hon. mention, W. A. Forsyth.

THE DISCUSSION SECTION PRIZE.—First prize, not awarded. Second prize of £1 1s. (special), J. C. Stockdale.

THE ARTHUR CATES SCHOLARSHIP.—W. E. Waymouth.

MEASURED DRAWINGS PRIZE.—A. J. Roddis.

THE ANDREW OLIVER PRIZE.—First prize (£3 3s.), not awarded. Second prize (£2 2s.), A. Stratton.

Lecture Side.—First year: Silver Medal, F. S. Hammond; Bronze Medal, G. E. Boys; Hon. Mention, E. Tylee. Second year: Silver Medal, C. C. Brewer; Bronze Medal, J. R. Stark; Hon. Mention, R. H. Hunter. Third year: Silver Medal, P. R. Smith; Bronze Medal, A. J. Johnson; Hon. Mention, W. K. Shirley.

Studio Side.—First year: Silver Medal, R. F. Summers; Bronze Medal, E. O. Cummins; Hon. Mention, E. G. Simpson. Second year: Silver Medal, J. P. Clark; Bronze Medal, A. Stratton and F. Taylor; Hon. Mention, C. C. Brewer. Third year: Silver Medal, C. C. Winnill; Bronze Medal, W. C. Waymouth; Hon. Mention, A. T. Walmisley.

The PRESIDENT said he regretted to announce the decease of Mr. James Fowler, of Louth, an old and valued member of the Association, and one who took a genial and prominent part in the annual excursions. It was agreed to send a letter of condolence to the widow.

Mr. E. S. GALE, secretary, proposed a vote of thanks to Mr. James Brooks for his promise of a prize of ten guineas for the best set of measured drawings of the choir of Oxford Cathedral.

THE INAUGURAL ADDRESS

was then delivered by the PRESIDENT. He remarked that his first duty was to render some account of the result of the first year's working of the new educational scheme. Speaking generally, that result was a very satisfactory one, amply justifying the expectations of those who took a prominent part in its inception, and spared no pains in working out the numerous details. They might congratulate themselves on the fact that though they had had many critics, representing as many different shades of opinion, their criticisms had been chiefly directed to matters of detail, while they had generally approved the scheme as a whole. Taking the Classes and Lectures first, the total number of full students who joined the first year's course was 30. In

addition to these there were a certain number of occasional students, who did not take the whole, but joined only certain classes and lectures. The number of these varied in the different subjects, but the largest number in any one class was 20, and this was in the Lectures on Materials and Construction. In the second year there were eight full students taking the whole course, and of occasional students the largest number attending any one class was ten—in the class for the study of Ornament and Colour Decoration—"English Architecture" coming next with nine. In the third year there were nine full students, and the largest number of occasional students was eight, in the class for Specification Writing and Quantity Taking. It had been intended to start a fourth year course if sufficient students sent in their names, but as the number of these was not large enough to justify the committee in doing so, that course was not held on the Lecture side. There was no need to be discouraged on that account, as it was both natural and advisable that the men should start in the earlier courses, and work up gradually to the more advanced ones, so that as long as there was a steady supply of students coming in at the bottom they would have plenty to fill the classes at the top in future years. Turning to the Studio side, the proportion of students in the junior years, as compared with the senior, was very similar to that in the lectures and classes. Thus, in the first year there were fourteen full students and seven occasional students, in the second year five full students, and five occasional students, and in the third year ten full students and eight occasional students. In the fourth year the Water Colour Class was attended by seven students, and the Discussion Section, which was practically the old Advanced Class of Construction, was as popular as ever. Considering that the Studio was an altogether new departure in the Association, the result was very gratifying, and showed that it supplied a real need which had been appreciated by the students. Coming to the financial side of the question, the result of the first year's working was more satisfactory than the committee had at one time anticipated. The scale of fees payable by students was arranged with the intention of making the scheme self-supporting. The committee expected, however, that for the first year or two the number of students would be insufficient to enable them to meet all expenses out of the fees received. This had proved to be the case, for although on the first and second years they realised a profit, this was all swallowed up by the loss on the third and fourth years, leaving a loss of something like £200. This statement of their financial position was not, taking into account the capital expenditure, necessitated by the alterations to the new premises, and the outlay in furnishing and equipping the Studio and class-rooms to fit them for the work to be carried on. This had been treated as an outlay of capital to be met by special donations from members and others interested in the Association. The amount received in donations to the general fund up to the present time was about £1,000. The President accorded a tribute of praise to the lecturers and instructors who had contributed so much to the success achieved up to the present. The Association was to be congratulated on having found such an able body of men to conduct its classes and lectures. Acting on the suggestions made by the lecturers and instructors, as the result of the session's working, several changes suggested by examiners had been made in the arrangements. This work was now classed under four divisions, instead of as many years, and a system was adopted by which a student could exchange any given subject in one of these divisions (within certain restrictions) for the corresponding subject in any other division. The duration of the lectures and classes was reduced from one and a half each to one hour each, except in the studio, where the work was not so exciting while it lasted. In order also to reduce the work included in each year's course, which was admittedly too heavy, a certain number of subjects both on the lecture and studio side had been classified as "extra subjects." That was to say, that without omitting any of the subjects from the curriculum altogether, they divided the subjects into two classes, those which the committee considered absolutely essential, and those which they considered as being only desirable. Arrangements had been made by which each student who paid an inclusive fee, either in the studio or classes, might also take up any one of these extra subjects each year without any

extra fee. The changes in the staff included the retirement of Mr. Schultz and Mr. Prioleau Warren, on account of the stress of business engagements, in whose stead Mr. W. G. B. Lewis had been appointed to the junior division, and Mr. J. D. Crace as instructor of the class of colour decoration. The President continued: The success of last session was all very well as far as it went; but it does not go nearly far enough, and we should like to see a much larger number of students working regularly in the classes this year than last. Out of a total of over 1,100 members, there were only 180 working regularly in the classes, or less than 17 per cent. of our total membership, which is a small percentage, considering the very large proportion of young men of which our membership is composed. Out of 100 new members who joined last session—almost entirely composed of pupils and assistants—only 54 availed themselves of the classes. Where are the other 46? After making all allowances for country members, and for men who had nothing more to learn—or thought so—we ought to have had at least 25 more men out of the 46 alone. I would draw the attention of the more senior members of this Association to some of the lectures which have been arranged for the fourth division, such as the courses upon painting, sculpture, and decorative art, for which we have been lucky enough to secure the services of such men as Mr. Stirling Lee and Mr. Walter Crane; also to the very excellent and comprehensive syllabus prepared by Mr. Edwin T. Hall for his three lectures on "Professional Practice." The President referred to the other means of instruction carried on in connection with the Association, first of which he placed the fortnightly meetings for the reading and discussion of papers, the visits to works in progress, and to old buildings, and the measurement of old work; he also called attention to the A.A. Sketch-Book and A.A. Notes, and suggested that the Essay Prize ought to be more keenly contested for than had been the case of late years. Turning now from the work of the students to matters of more general interest, I must, the President added, say a few words on the subject of the differences which marked the close of last session, and which at one time threatened to cause a serious split in our ranks. Although in the heat of the controversy much was said and much was written on both sides, which in calmer moments they would probably regret, yet wiser counsels have prevailed, and the good sense and moderation of both parties has shown them that by the exercise of a little tact and consideration for the opinions of others, each can learn something from the other, and that more good can be achieved by united action than by a blind and unreasoning hostility. I trust that all feeling of enmity has passed away, and that we shall have the cordial co-operation of all members for the welfare of the Association in the future, as we have in the past. At no time of its existence has this Association more needed the strength which is the result of united action, standing as we do on the threshold of a new departure in our history. Among the questions raised in the dispute were some of vital importance to this Association, and not only to this Association, but affecting interests of a wider range. In consequence of our having endeavoured to do something to systematise the course of study for architectural students, we have been accused of degenerating into a mere cramming ground for the Institute examinations. Cramming is the operation of forcing information into a man at high-pressure so as to enable him to acquire just sufficient to pass an examination in a given time, and is only necessary for those who have not availed themselves of the ordinary means of instruction. I hardly think that the term "cramming" can be properly applied to a course of instruction which is spread over at least four years, and which may be spread over a longer period still at the option of the student. The advice to students printed in last year's Brown Book stated that the course is expressly designed for the purpose of preventing the necessity for cramming, and the student is advised not to attempt to go through the whole course in four years, unless he is able to devote a certain amount of time in each week during the day for the purpose of reading books referred to in the various lectures and for private study. The term "cramming" is, therefore, altogether misapplied in speaking of the A.A. course of instruction. Then as regards the question of preparation for the Institute Examination. The primary object

we had in view in laying down the new curriculum was to afford an opportunity for acquiring instruction in those subjects which, coupled with the experience to be gained in an office, would fit a man for his work as an architect; but at the same time we felt bound to take notice of the examination tests imposed by such bodies as the R.I.B.A., the R.A., or other kindred societies for the admission of students to membership or to their schools, and had we not done so we should have failed in our duty to our students and to ourselves. Whether the Institute should or not impose an examination upon all those who desire to be admitted within its ranks is a question into which I do not propose to enter here. The point that we, as a teaching body, have to consider is the fact that the examination exists, and that many of our students come to us for the express purpose of acquiring the information in our classes or studio necessary to pass it. The student has perfect freedom of action, and if he desires to go in for the examination we believe that he can obtain all the information necessary in our classes; if, on the other hand, he does not wish to do so, he can take up as much of the course as he thinks necessary or suitable to the particular bent of his genius. Again, it has been said that, by accepting a contribution from the Institute towards our funds, we have sacrificed our independence, and handed ourselves over to that body bound hand and foot. I do not believe it, nor do I think that anyone else who knows anything of this Association or of the Institute would believe the acceptance of a grant implied any such thing. We are the best of friends, and I hope may remain so; but we, as an Association, are jealous of our independence. Self-help is one of our guiding principles, and self-government is inseparably connected with it; and though this Association has been in existence for nearly fifty years, I think it has reason to be proud of the fact that until last year it had never appealed to those outside its own ranks for pecuniary assistance, and it only did so then because it was endeavouring to found a scheme of education on a much wider and more comprehensive basis than had ever been attempted before, and which required a larger outlay of capital than it had at its disposal. But though the Institute responded generously to that appeal, it is not to members of the Institute alone that we are beholden for contributions to our funds. Among the list of subscribers are to be found such names as that of Mr. Norman Shaw, Mr. T. G. Jackson, Sir Arthur W. Blomfield, and others, gentlemen who are strongly opposed to the policy of the Institute, and who, for want of a better title, have been called the "Memorialists." We are equally beholden to these gentlemen for their assistance, but it is urged that by accepting their contributions we have sacrificed our independence, and handed ourselves over bound hand and foot to them also? The traditional policy of this Association has always been not to mix itself up in architectural politics at all, but to devote itself to the education of its students, and the promotion of good fellowship amongst its members, and hence it is that we have had the cordial co-operation of all those interested in the progress of architecture, no matter whether they be members of the Institute, of the Royal Academy, the Society of Architects, or of any other body. I trust that by a continuance of this policy we shall have an equally wide support in the future. There has been in the past one platform upon which all these men could meet, and that was the platform of education. It seems to have been tacitly admitted that, however divergent their views might be upon the burning questions of the day, they were all prepared to admit that some education was necessary for young men who wish to become architects, and that it is seldom, if ever, that all that is necessary can be obtained in the routine of an office. I appeal to all those, therefore, who are interested in the progress of architecture to sink their differences, and to give us their advice and co-operation in carrying on the work of this Association, irrespective of their belonging to any particular society or not. This is the basis of support upon which we have rested in the past, and upon which we shall also rely in the future. The education of architectural students in the past has been of a most haphazard and imperfect description. Here and there brilliant geniuses have stood forth in spite of the system, shining like beacon lights in the general gloom, and only serving by their brilliance to make the

surrounding darkness seem the blacker; but courses of instruction are not arranged to suit the genius. He is a *rara avis*, usually most erratic in his habits, and may be left to soar aloft on the bright wings of his imagination, untrammelled by the conventionalities of everyday requirements. We can leave him with confidence to pursue his own bright aerial flight. What we do want, however, is to effect a general raising of the standard of excellence among the earnest and thoughtful men, who will in after-life have to carry on much of the world's work. We do not profess to be able to create artists; for the artist, like the poet, is born, not made; but what we do profess to be able to do is to educate that artist when he has been created; to assist in developing the artistic instinct which may be within him, and to give him an opportunity of acquiring instruction, *pari passu* with his artistic development in those methods of practical construction and sanitation without which his artistic attainments are of very little value. Surely this is a basis upon which all architects may unite to assist us. That some such instruction is urgently required may be seen by anyone who will walk through the streets and examine the buildings which have been erected in the past fifty years or so. There are a few brilliant exceptions, but these form but a small percentage in the vast aggregate of dull, monotonous, common-place buildings, plastered over with meaningless ornament and covered with unnecessary features, which force themselves upon us on every side. We have heard much of late years about styles and the possibility of a new one being created, which is to become the style of the future; but what we want is "style," not "styles," and it is not until we cease masquerading in the fancy dress of every other country and period but our own that any real progress will be made towards the attainment of this object. What do we mean by "style"? "Style" in architecture is the language by which we express our thoughts, and it should be the natural expression of the requirements of a building controlled by the exigencies of climate and the proper use of the materials at our command. When we can be satisfied with giving a natural expression to the requirements and construction of our buildings, only using ornament where required for a definite purpose, and thinking less of past styles and more of modern requirements, then, and not till then, shall we once more have a style of our own. As long as we continue to reproduce the styles of the past in our work of to-day, and to palm them off upon a confiding public as our own creations, so long shall we delay the possibility of architecture once more becoming a living art amongst us. Let us study and reverence the work of the past, for there is much to be learned from it; but the highest and the best lesson of all is not to copy it. I would, in conclusion, urge you to think no trouble too great to achieve a satisfactory result in your work, and never to rest until you have made whatever is confided to your charge as perfect as possible for its purpose, and as beautiful as you can, no matter how small or simple the work may be. Everything is capable of being invested with some amount of individuality and interest if we will only take the trouble to think for ourselves, and not blindly follow the stereotyped forms laid down for us by others, and it is often the smallest things which require the most care and thought, and in which true artistic feeling is best displayed. Do not suppose that I would seek to curb or restrain the aspiring genius who dreams of doing great things; on the contrary, set your ideal as high as you possibly can, for it is given to few men to attain to the summit of their ambition, and the higher your aim the greater chance of your doing something; but it is not in cathedrals or other buildings of great size and importance alone that scope is afforded for originality and artistic feeling, but that everything which comes to your hand, no matter how small or insignificant, is capable of being made beautiful and suitable for its purpose, and such that it may give pleasure to those who have to use it. If you do this, you will have realised in the highest sense the meaning of our motto: "Design with beauty, build in truth."

Mr. ASTON WEBB, past-president, in proposing a vote of thanks to the President for his address, remarked that he had peculiar pleasure in doing so, as Mr. Cresswell was the first pupil he took. In that address the President had steered exactly between the two extreme views of architecture,

and all must rejoice in the excellent record of work done. In his own presidency the times were easy-going compared with to-day; they relied on mutual self-help, whereas now the Association rejoiced in a journal of its own, and even indulged in the luxury of a contested election. All felt their indebtedness to the originator of the new scheme, Mr. Stokes, and were glad to see that the first year's working had been carried out with so little loss. There was, he thought, a high diploma to be gained in the profession; but it was not one conferred by the association or any other body; it was to be obtained in the streets, in the appreciation of their buildings by their fellow-workers and the general public.

Mr. COLE A. ADAMS, past-president, seconded the motion, and in doing so congratulated the members, and especially Mr. Stokes, on the success of the new scheme, and proceeded to endorse the President's emphasis of the value to an architect of the measurement of old work. He concurred with the President that there was no temptation to cramming or mere superficial study in the Association's curriculum.

Professor ROBERT KERR, senior past-president, supported the motion, and remarked that the Association, founded nearly 50 years ago on the basis of mutual self-help, was now developing into an architectural university which was in no sense a cramming institution. After a year's experience of the new scheme he had a much higher opinion of it than at its inception. The work accomplished was thorough, solid, and substantial. There were two great colleges in London which were putting forth great efforts to help architectural education, but in one respect the Association had the advantage, in that all its lecturers and teachers were practical architects. He did not agree with the criticism that had been passed on the scheme that its management ought to have been placed in the hands of older men, for he believed they were the right men to carry it on. As for the great controversy that was being carried on just now as to whether architecture was a profession or an art, he held that they did not all want to be artists. He was not himself a great artist. At the recent dinner of the Association he happened to say this to a great church architect, one of the leading memorialists, who sat next him, adding that he drifted into the profession quite by accident, and to his surprise his neighbour answered, "So did I." So did a good many more; he believed Burges and Street did, and certainly Sir Gilbert Scott did. Many men became architects as a means of living, and for these the Association provided instruction. There were some geniuses who wished to soar into the empyrean. Let them fly, he said; it would do them good; and disperse their superfluous energy, while they would be glad enough presently to descend again to sober earth.

Mr. THOMAS BLASHILL, a past-president of thirty years ago, supported the motion, and suggested that an excursion to Italy should be arranged next spring. If one were decided upon he should be happy to undertake its management, as in the past.

The vote of thanks having been carried by acclamation, the President responded and said the committee would gladly accept Mr. Blashill's offer of help in organising another Italian excursion.

THEATRES.—XI.

By ERNEST A. E. WOODROW, A.R.I.B.A.

THE rules governing the widths of "every staircase, landing, lobby, corridor or passage," should also determine the dimensions that should be given to the doorways situated in such "staircase, landing, lobby, corridor, or passage." In chapter IX., published in the issue of the BUILDING NEWS of 30th September, I detailed the views of the various authorities upon the question of the width of exit: and it must be understood that the widths set forth in the regulations there quoted were to be measured at the narrowest part of the "staircase, landing, corridor, &c." As a rule, the narrowest part is the doorway, and, although the passage may be 4ft. 6in. in width, the doorway is often reduced to 4ft. or less, by the projection of the door-frame, the thickness of the door, when open, or the addition of the automatic bolt, as in Fig. 1. It is only necessary to suggest that the full width of the passage-way should be retained its entire length, that no reduction should occur at the door-

way, and various methods of overcoming the difficulty will occur to my readers.

Rule 25 of the London County Council, which I take as my text for this chapter, enacts that: "All doorways used by the public shall be at least 4ft. 6in. wide in the clear, with doors hung

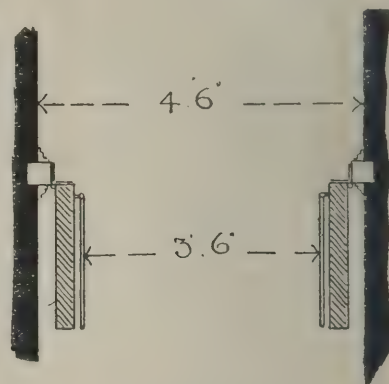


Fig. 1.

in two folds made to open outwards towards the thoroughfare or way."

The 4ft. 6in. herein mentioned is, of course, "intended for the use of not more than 400 persons of the audience"; but if any portion of the house accommodates a larger number of the audience than 400 persons, the doorway must be increased in width by 6in. for every additional 100 persons until a maximum width of 9ft. be obtained.

All doors should, where the width is 4ft. 6in. or more, be "hung in two folds," so that pressure from within will force them to "open outwards" from the centre "towards the thoroughfare, or way." Where doors are used for entrance they, of course, must open inwards to admit the crowd, as well as outwards, to allow them to depart. When opened inwards the L.C.C. requires (as in the case of barriers) that they should lock back against

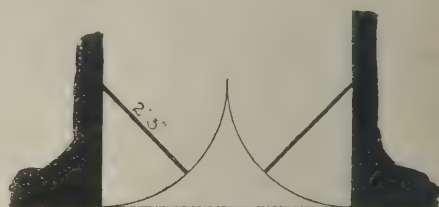


Fig. 2.

the wall in such a manner as to require a key to release them; and it is also well that they should fold back into a recess, in the same manner described as for barriers in the ninth chapter of this series. There is a difficulty often experienced in making external doors open outwards across the pavement: vestry authorities object, and the architect has to place his door in a recess, with the frame 2ft. 3in. back from the front wall, that is half the width of 4ft. 6in. as Fig. 2, so as not to allow the door to encroach upon the public footway. This unfortunately leaves a space, which too frequently becomes a public nuisance, and a sleeping place for vagrants; and to protect himself against such abuse of his premises the manager requires his architect to provide an external gate, or grille, to shut off this recess from public use or abuse at night. I must here remind my readers that the regulations we are now considering provide against movable or shifting gates, and insists that all doors used for entrances and all gates must be made to open both ways, &c. . . . again, no locks, monkey-tail, flush or barrel bolts, or locking bars, or other obstructions to exit, can be used on any doors, gates, or barriers. Gates, where they are necessary, should be made to open outwards in the same way as doors. I would suggest that they should be attached to the door by a bar, A, Fig. 3, which would permit them to open in conjunction with the door, by pressure from within. These gates could be so hung as to allow them being lifted off the hinges, and taken quite away, but if by any neglect on the part of an attendant, they were not removed they could be opened outwards in con-

nection with the doors, and be no obstruction to the general exit of the people. They should have no other fastening than what is required to secure the bar A to the door. (Fig. 3.)

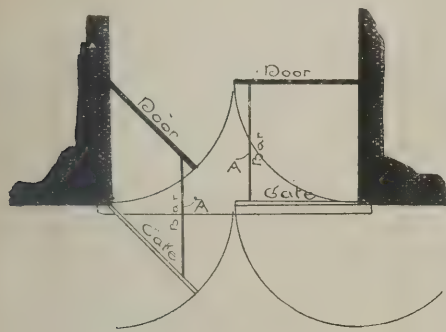


Fig. 3.

Doors are frequently required in vestibules, passage-ways, and on staircases, to cut off the inrush of cold air to the auditorium: where such internal doors are required they should "be so hung as not to obstruct, when open, any gangway, passage, staircase, or landing."

"No door should open immediately upon a flight of steps, but a square landing at least the width of the doorway should be provided between such steps and such doorway." This is evidently to prevent any one opening a door, and finding themselves suddenly at the head of a long flight of stairs so that when there is a top landing outside the door two or three strides must be taken before reaching the first step, and the risk of precipitating headlong down the stairs avoided. It is often desirable where such internal doors are used, to glaze the upper panels, so that any one may see what is beyond the door, before opening it to rush through.

I now come to what is, perhaps, the most difficult part of my task in this chapter, the question of the fastenings upon doors. I feel I shall be compelled to mention by name the makers of fastenings which have been looked upon as suitable for the purpose of theatre doors; but in doing so I wish my readers to understand I in no way speak of these fastenings as superior the one to the other, or as better fitted for the purpose than others which may or may not have been mentioned by me; neither do I admit that I consider them perfect, or imperfect, in detail or construction. I speak only of the principle of their action in the broadest sense.

The rule which has caused the invention of automatic bolts, is a further part of the L.C.C. twenty-fifth regulation.

"All exit doors having fastenings shall be fastened by automatic bolts only, of a pattern to be approved by the Council; but where such doors are also to be used by the public for entrances, they shall be fastened with espagnolette or lever bolts only, of a pattern to be approved in each case by the Council, and fitted with lever handles at a height of 3ft. 6in. from the floor."

"All barriers and internal doors shall be made to open outwards, with no other fastenings than automatic bolts."

"No locks, monkey-tail, flush or barrel bolts, or locking bars, or other obstructions to exit, shall be used on any doors, gates, or barriers."

The difficulty that the manufacturer has to overcome (I do not say whether or not the bolts in the market have surmounted this difficulty) is to provide a fastening that will at once give way to the slightest pressure from within, and yet, at the same time be a security against the outside world, so as to protect the property of the theatre. One manufacturer writes me that: "The history of panic bolts, which has been one of continual development, is based upon the initial requirements of the L.C.C. and the necessities and peculiarities of customers and users. We have found a successful apparatus must combine ease in opening by a panic-stricken public inside the building; economy in first cost; durability and strength in all the parts; simplicity in construction; freedom from difficulties in fixing; applicability to single and folding doors, hung in rebated frames opening outwards only, and single and folding doors to swing, to doors of any material, with square or carved heads. There must be means for opening from the outside when necessary. The

least possible encroachment upon width of opening when the doors are opened, has also had to be taken into consideration, as well as a secure fastening of the doors so that no unauthorised person can obtain admission."

This clearly puts forth the work required by an automatic bolt, and are the views and opinions of Mr. Copping on the subject. An automatic bolt should not lessen the width of the doorway by its projection, nor should it be of such a pattern as to prevent any one—intentionally or inadvertently—rendering the unfastening of the doors impossible, by placing an umbrella or walking-stick, for example, between the operating horizontal arm and the door.

Fig. 4 is a sketch of Kaye's well-known automatic bolt; while pressure against the

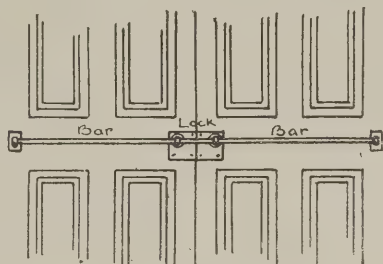


Fig. 4.

bar A releases the fastenings. In "Baker's" bolt, instead of an iron or brass bar, there is a slight wooden projection across the central rail. It is claimed, that by this apparatus doors can be securely fastened, so that they cannot be opened from the outside, but that they will be liberated and free to open immediately any pressure is applied from the inside, either directly or indirectly to the fastening. There are other patents differing, doubtless, in the internal mechanism, the names of the makers I am unable to give, on account of having insufficient information on the subject, although I have endeavoured to collect it, in preparation for this chapter. One desideratum in automatic fastenings is, that when the bolt or fastening is once drawn, it should be held back so as not to catch in the floor or door frame, and cause the door to get fast. The fearful disaster at Sunderland, it will be remembered, was caused by a barrel bolt catching in the floor of the landing. This was a lesson taught with such dreadful severity, that one shudders at the sight of inappropriate fastenings on any doors in a building (licensed or unlicensed) where vast congregations of people meet. Much, indeed, which I have had to say in these papers has been said by me with a view of its application to other buildings than theatres, for the public need as great a protection in the church, lecture-hall, or exhibition as in any theatre or music-hall. The improvements which are likely to arise in the future development of automatic bolts are such as to permit one to expect them to be of a pattern which will be easily adapted to entrance doors opening both ways, thus doing away with the necessity of lever-handle bolts; in fact, I believe that the various makers have already placed before the public modifications of their automatic bolts applicable to these requirements.

Following the course I have adopted in former chapters, I must now briefly review the opinions of others, on the part of the subject now under our consideration, in order that we may learn what to adopt, avoid, modify, or convert to the usages of a theatre. In Italy there is a rule that attendants must be provided (at the expense of the management) one at every exit, or for more than one exit if in the same line, and within a short distance of each other. Such attendant must be provided with a key, and be in readiness to open the doors in case of emergency. Personally, I think it more than likely than in "case of emergency" the said attendant would think of himself before the public, and it appears to me to be a very unwise rule, for it places the safety of the public in the hands of one man. As the Italian regulations are mostly so very stringent, I wonder at the conditions in this particular one. Keys are so apt to be lost when most wanted, and even the provision made in the Brussels regulation does not, to me, meet the exigencies of the case. Here the external doors, only, may have locks, which must always open with one pass

key, and every emergency door must have a key placed in a glazed box within reach of the public. From this any one who was desirous of creating mischief could take the key away, and leave the door locked.

The go-ahead Americans in New York have not yet demanded automatic panic bolts, for here movable bolts are allowed, which must be kept drawn during the performance. But suppose the man whose duty it is to draw the bolt does not do it? Berlin asks for all doors to be unlocked during the performance. (Should not they be all unlocked before the audience is admitted?) Hamburg requires that the fastenings on the side next the audience shall be of such a pattern as to be easily and quickly opened by the public. The act of opening must not necessitate stooping down, the knob must not be above the shoulder, and the fastening must be as simple as possible. This restriction as to height is a good one, as the pressure against the door is from elbow to shoulder height.

The St. Petersburg rule, like that of Hamburg, accords more with that of London than any others I have quoted. "All doors and windows, (which must be casement hung), must be supplied with easy working apparatus for opening them, with handles not lower than 2ft. 6in. from the floor. Bolts are not permitted under any circumstances."

With regard to locks on other than entrance and exit doors, i.e., on dressing-rooms, offices, stores, saloon doors, &c., these should be all made to pass a master key, and each fireman, the manager, or other responsible persons should be provided with such a key, so as to be able to enter and examine any room at any time. No room should be so private in a theatre that the fireman cannot obtain admission at any time. Fires frequently occur in rooms that have not been entered for an hour or more; a smouldering fire may start in a locked-up dressing-room or office of a theatre; therefore the fireman should be able to examine all parts at all times. The other separate keys of each individual room should be hung on a "key-board" in the stage-door keeper's or porter's office. Here they can be quickly obtained, and when it is known that they are always to be found in one place when the room is locked, there is great saving of time in searching for the attendant, who may or may not be expected to have possession of it.

My attention has been drawn to a working model of a patent exit-door invented by Messrs. Lancaster and Nixon, a short description of which the character of these articles demands. The following account of the working of the invention has been furnished me by the patentees.

The door is divided vertically, so as to form two doors, one portion slightly overlapping the other on the outer side, the portion that overlaps being held at the foot by a spring operating on a catch. Attached to the top of each door is a spring forcing them both open the moment the catch at the foot is withdrawn. This withdrawal is simply brought about by the pressure of the foot, as a person approaches the door from within. The floor in the vicinity of the door, on the inner side is a small platform, so constructed that a weight of 40lb. or more, pressing upon it, will produce a depression along a transverse line to the extent of an inch, thereby forcing down the spring to which the catch is attached that holds the doors. The catch only requires a drop of a quarter of an inch in order to withdraw it, whereupon the doors at once fly open, and so remain until restored by hand to the closed position. The catch is a small vertical bolt, which sinks below the level of the platform as long as the latter is acted upon by the specified weight. Thus a crowd rushing out from the building would meet with no obstruction, and the slight depression in the centre of the platform would create so gentle a slope as to cause no embarrassment. With the exception of this little bolt or stud, there is no fastening of any kind attached to the doors. A person seeking to escape has simply to run within a step or two of the threshold, and the doors fly open, presenting a perfectly unimpeded means of exit. The action is so entirely automatic that no trepidation or blundering on the part of the individual seeking to escape will have any tendency to prevent the opening of the doors. On the other hand, until the doors are thus automatically opened from the inside there is no possibility of any one entering from without. The only fear that at present occurs to my mind is that should any dust or obstruction collect beneath the platform (while

is made to "produce a depression along a transverse line to the extent of an inch") the automatic action would not be produced, and the doors remain unopened. Where, however, the doors were in constant use this fear would be overcome, as any obstruction would be easily removed. On the question of cost I am not informed sufficiently to speak here.

I have lately had some correspondence with two French gentlemen, who have forwarded me the following description of a method advocated by them as a means of reducing the calamities from panic. "M. René Résuche, aided by his colleague, M. A. Vailly, has been led by his studies and inquiries," says the *Figaro*, "to the discovery of a 'system of instantaneous evacuation,' by means of which thousands of spectators in any theatre can be restored to the open air in the space of a few seconds. His invention can be modified so as to adapt itself to theatres standing alone, or built upon two or three sides. There is only one indispensable condition, that on every disengaged side, and on each story, there should be outside balconies connected by staircases with those below." . . . "Résuche's invention deals especially with the walls of the buildings. These movable walls must be made of two sheets of iron, the space between them being filled up with refuse of cork or some such light material, which will retain the heat, without injuring the acoustic properties. This ingenious wall is suspended on chains fitted with pulleys and balance-weights connected with a windlass placed in the basement. In case of fire the windlass is put out of gear, the iron wall descends by its own weight into the space which has been provided for it in the ground, like the well of a lift, and all the balconies on every side of the theatre are instantly free. In the second system of instantaneous evacuation, the walls of each story are mounted on hinges, and connected outside by cables running over pulleys inside with balance-weights for the stoppage. One ungearing is enough, the walls descend like a draw-bridge, and resting on the balustrades already in position, form so many balconies. In a third system, according to the site of the building, the wall runs horizontally in grooves fitted with rollers and balance-weights, and it then sets free an opening corresponding with its own width. But in every case, whether the theatre be detached or surrounded by other buildings, the same method—namely, that of movable iron walls—must be applied."

Such is the description of what may briefly be termed automatic doors opening onto external balconies and external staircases; but there is one serious drawback, that I can point out without having seen the invention applied—the cause of effecting the working of the apparatus is fire. In case of fire the windlass is put out of gear, &c. How many fatal crushes and panics have occurred without one spark of fire? Sunderland, Hampstead occur in our minds at once. The principle of doors onto outside balconies is a good one, but to employ the enemy to make the means efficient is radically wrong. How are such "safety valves" to act when panic arises without fire? How in such a case as that at Bolton this week, when, during a fire in the town the wife of a fireman ran to the theatre, where her husband was witnessing a performance, and shouted to him that there was a fire? The audience misunderstood her, and rose en masse. Several ladies fainted. The manager rushed to the stage and explained the circumstances, but a quarter of an hour elapsed before order was restored. Simple cases like these have to be met, as well as great disasters like the Ring Theatre.

DRAINAGE AND PLUMBING SPECIFICATION.

By ARTHUR BAKER, F.R.I.B.A.

PREFACE.

MUCH valuable information and instruction in the details of plumbing and sanitary work has been given in the works of T. Pridgin, Teale, Rogers Field, S. Stevens Hellyer, J. Wright Clarke, William R. Maguire, &c., with which all students should be familiar before they attempt drainage work. Yet, with all this knowledge at hand the attempts at modern drainage are but too frequently failures. The experience of the author has led him to believe that this arises as much, if not more, from either a want of knowledge or of attention to these details, than

of the general principles of sanitation. This has led to their being left to the discretion of the plumber, whose knowledge rarely extends beyond the mechanical details of the trade. Those also who are conversant with the subject may be guilty of imperfect specification writing, through the labour required in remembering and arranging a mass of technical details. To both these classes, therefore, the author hopes he may be useful in his effort to combine in the following specification both his personal experience and the views of the best sanitary authorities. For the sake of brevity, the usual conditions of the contract, which would include insurance, the provision of water, maintenance of works for a certain period after they are completed, &c., &c., are omitted. In writing the condition for payment, the architect should be careful to provide that the first certificate for payment should not be given until the drains have been tested the second time (see Clause 14). It is better, however, if possible, to postpone payment till the whole of the work is completed. A drawback should be kept for a period in proportion to the extent of the work, and sufficient to cover the probable cost of making good defects which may arise after the completion. It should be noticed that frequent reference is made to the "Plans," which should be drawn with the greatest care, with details given of the inspection chambers and all junctions of the pipes with the drain, &c., the levels and falls of pipes being figured. As no specification could be made to meet all circumstances, alternative clauses have been given suggesting modes of treatment applicable to varying cases. The author has left to the judgment of his readers the question of the selection of fittings, which must depend upon the money at command and on local circumstances. He would only strongly impress the necessity of the greatest care in selection, personal tests being preferred to faith in advertisements.

GENERAL CLAUSES AND MATERIALS.

1. Portland cement :—

The Portland cement to be sound, fine, slow-setting, air-slaked, strong cement, capable of bearing the following tests* :—

1st. *For Soundness*.—Make on three pieces of glass three pats of cement, 2in. diameter, $\frac{1}{2}$ in. thick in the centre, and thin at the edge; one of neat cement, placed 24 hours after it is gauged in cold water for seven days, must be perfectly free from cracks, and the edges must not leave the glass; one as above, in the proportion of 1 of cement to 3 of sand; the other, of neat cement, kept in the air, must be, when set, of a greyish-white colour, and must be free from cracks and from any buff stains.

2nd. *For Fineness*.—The cement must be able to pass through a sieve of 5,625 meshes to the square inch, leaving a residue of not more than 10 per cent.

3rd. *For Slow Setting*.—A pat of neat cement must be capable of indentation of the thumb-nail two hours after it is made.

4th. *For Strength*.—One cubic inch of neat cement, mixed with the minimum quantity of water necessary to set the cement when gauged into a mould, and (24 hours after it has been gauged) immersed in water 7 days, must be capable of bearing a tensile strain of 350lb., and 480lb. after 28 days.

5th. *Specific Gravity*.—To be not less than 3.1 after drying for 15 minutes in a desiccator at 212° Fahr., and this shall be ascertained by a Schumann or other approved apparatus.

OR, the contractor may supply a guarantee from the manufacturer that the cement supplied for the purpose of the work herein specified is capable of bearing the above tests, and the architect, at his option, may accept the same, but without prejudice to the liability of the contractor under Clause — in the general conditions of the contract referring to maintenance of works.

2. Delivery of cement :—

The cement required for the work, or such portions of it as may be directed by the architect, is to be deposited on the works — days after the contract is signed.

3. Sand :—

The sand to be quartz sand of approved quality, free from salt, vegetable, iron, clay, or slimy or

* The quality of this cement would be rather above that usually to be obtained, but the best manufacturers would supply it at a slightly increased cost, and guarantee its capability of standing the above tests.

earthy matter, the whole to pass through a sieve of 400 meshes per square inch, and the whole to be retained on a sieve of 900 meshes per square inch.

4. Concrete :—

The concrete is to be composed of well-washed Thames ballast, clean gravel, or broken brick of a size to pass through a $\frac{1}{2}$ in. mesh, and approved by the architect, with sufficient sand to fill up the interstices in the proportion of five parts of the above mixture of gravel and sand to one part of Portland cement, to be well mixed and incorporated with the full quantity of water which the material will absorb.

5. Grout for filling round sockets of pipes :—

The grout for filling under sockets of pipes to be made of three parts of sand to one part of cement.

6. Cement mortar :—

The cement mortar for building and rendering walls and grouting to be composed of three parts of clean, sharp sand, and one part of Portland cement.

7. Cement for making pipe-joints :—

The cement for making pipe-joints and floating the sides of inspection chambers to be composed of one part of clean, sharp sand, and five parts of Portland cement, the cement to be mixed fresh for each joint. (See also clause 22.)

8. Cement to be used in contact with lead or iron pipes :—

All concrete to be made, and brickwork to be set with, Portland cement, no lime being allowed to come in contact with the lead or iron pipes.

9. Pipes to be tarred :—

All lead pipes buried in, or passing through, walls to be tarred before they are fixed.

10. Cutting away and making good floors :—

Do all necessary cutting away of wood, tile, stone, or other floors, and make holes through walls for pipes, and make good to ditto, and to pointing and surfaces of walls, and leave all perfect at completion.

11. Remove from premises all waste water, &c., arising from the works* :—

Keep all w.c.'s and all sinks, lavatories, baths, gullies, and house and yard drains free from all waste water, slops, dirt, &c., arising from the works, and remove all such waste water, slops, dirt, &c., from the premises. A penalty of £ will be enforced for every occasion on which w.c.'s, sinks, baths, lavatories, gullies, drains, &c., are used contrary to this clause.

12. Protect w.c. and other fittings :—

Protect all w.c., sink, bath, and other fittings, and all pipes, and put temporary wood casings to all terminals of pipes liable to be injured, or to have dust or rubbish dropped into them during the progress of the work, and leave clean and in perfect working order at completion.

13. Examine fittings :—

All fittings before they are fixed to be carefully examined by the contractor, who will be responsible for their perfect condition.

14. Testing :—

The drain-pipes, including the pipes between the siphon and the sewer, are to be hydraulically tested for at least eight hours†—first, after the joints are made, and before the pipes are covered up, and a second time at a period of . . . days† after they are covered up; the soil-pipes are to be hydraulically tested before the apparatuses are fixed, and the whole of the drainage system, including all siphons, gullies, inspection chambers, &c., and w.c.'s, sinks, lavatories, bath, and other fittings, to be again subject to such hydraulic, peppermint, smoke, and other tests, as the architect may require upon the completion of the work before it is handed over to the employer. The contractor is to supply all necessary air-tight stoppers, manhole cover keys, peppermint, and

* This clause should also be inserted in specification for painting, decoration, &c. £2 is an effective fine.

† This is necessary, that the water may have time to soak into joint made with imperfectly-mixed cement, or with cement containing unslaked particles, and to enable the fracture of the socket caused by the expansion to be discerned. The author has known of cases of pipe-sockets being fractured, through the use of bad cement, after the pipes had been successfully tested on two occasions.

† Say, 28 days.

other appliances and materials and labour required for testing.

15. Regulations of water co.'s, &c.*:—

The regulations of the Water Co. and of the public authorities are to be observed, and the cost of laying on the water is to be paid by the contractor. If the water co.'s regulations are found to be at variance with any clauses in the specification, notice is to be given immediately to the architect.

EXCAVATING.

16. Digging trenches:—

Excavate for trenches and foundations of inspection chambers, branches, gullies, &c., to the depth shown on the drawings, or as may be required for the pipes, drains, gullies, inspection chambers, &c. Do all necessary planking, strutting, and shoring, and keep trenches free from water, fill in ground after the pipes are laid, and ram ditto, and make good surfaces.

17. Removing soft and impregnated earth:—

Remove all soft earth, and earth impregnated with sewage matter, and fill up with clean gravel or hard dry brick rubbish, and well ram ditto, provided, however, that the excavation does not exceed the depth of 12in. below the underside of the drain-pipes when laid, in which case the space is to be filled with concrete.

18. Width of trenches†:—

The trenches to be not less than . . . wide for 6in. pipes, and . . . wide for 4in. pipes, and the ground to be made up to the required levels, and well rammed, the depth of the trenches, &c., to be not less than 6in. below the under side of the pipe when laid.

19. Cutting through walls:—

Do all necessary cutting through walls, and shoring and underpinning ditto where pipes pass under or through walls, and make good ditto with cement.

20. Making good surfaces:—

Make good the surface of all roads, paths, pavements, &c., and all wood and stone floors, and wood and stone steps disturbed in laying drains or fixing apparatus which are not otherwise specified to be altered or removed.

INSPECTION CHAMBERS.

21. Floor and walls of chamber:—

Form inspection chambers of the sizes shown upon the drawings with, concrete floor, and foundations to walls . . . thick, and walls of brickwork in cement . . . thick, the inside measurement of the chamber to be . . .

OR. form floor and walls of inspection chambers with concrete . . . thick, the inside measurement of the chamber to be . . .

22. Side inlets:—

Provide and fix in all inspection chambers . . . channel pipes, with . . . side inlet channels as shown on drawings. Fill in between the channels with concrete flush with the face of channel, and slope ditto to sides of chamber, and render, with cement (Clause 6), and float with

23. Channels:—

The channels in inspection chambers to be laid in the direction of the outlet of the main drain, and to be of suitable curves, the socket end being set square with the branch pipe, and the outlet lineable with the side of the channel (see Fig. 1). The curves of channels must not be as shown at C (see Fig. 1).

24. Rendering to sides of chamber:—

The sides of inspection chambers to be rendered with Portland cement (see Clause 6), and floated with cement (Clause 7), and finished to a perfectly smooth surface with neat cement.

25. Iron steps:—

Provide No. . . . ½in. wrought-iron steps, with returns flattened and turned up at the ends, and build ditto into the walls of inspection chamber, and paint ditto four coats.

26. Inspection chamber covers*:—

Provide iron frames and covers for inspection chambers, and well bed down do., and fix level with pavement, and provide and fill the channels in ditto with . . .

STONEWARE PIPES.

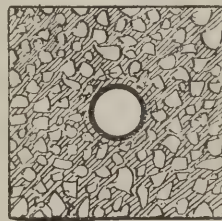
27. Stoneware pipes:—

Earthenware drain-pipes to be, or other approved socketed stoneware tested pipes, completely salt glazed and vitrified throughout, of true bore and form, of even thickness, and of the sizes shown upon the plans, the thickness of pipes to be not less than ½in. for 4in. and 6in. pipes, ¾in. for 9in. pipes, and 1½in. for 12in. pipes.

28. Pipe-laying†:—

The pipes to be laid to falls, with a bevelled straight-edge, and a gauge the length from socket to socket of the pipe when fixed, to insure the spigot being driven home into the socket, as

FIG. 2.



shown on drawings, on a bed of Portland-cement concrete, 6in. thick and 18in. wide for 4in. pipes, and 20in. wide for 6in. pipes, with additional thickness when required to make good clay hole, or when soft earth has been removed (see Clause 17), and leave space under each socket for making the joint; and after the joint is made and tested (see Clause 14), they shall be covered with concrete 6in. thick, the space round the joint being run with grout (see Clause 5). The concrete bed must be carefully cleaned before the pipes are covered with concrete, care being taken that the concrete covering is well filled and rammed in under the pipes.

OR. lay bottom of trenches with a layer of concrete, 3in. thick and 18in. wide for 4in. pipes, and 20in. wide for 6in. pipes, with additional thickness when required to make good clay hole, or when soft earth has been removed (see Clause 17), and lay pipes with a bevelled straight-edge and a gauge the length from socket to socket of the pipe when fixed, to insure the spigot being driven home into the socket, to falls as shown on drawings, on brick or concrete piers 3in. high, set in cement, and joint and test pipes, clean concrete bed; fill in under the pipes with concrete 3in. thick, and over and round pipes with concrete 6in. thick.

OR. the pipes to be laid to falls, with a bevelled straight-edge and a gauge the length from socket to socket of the pipe when fixed, to insure the spigot being driven home into the socket, as shown on drawings, on 9in. piers of concrete 6in. thick,

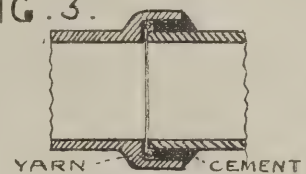
and after the joints have been made and tested, the pipes are to be filled in under and over with concrete 6in. thick, so that the concreting round the pipe may be one solid continuous mass (see Fig. 2). Put such extra thickness under piers and pipes as may be required to make good clay holes, or where soft earth has been removed.

29. Extra fall to channels and curved pipes:—

Give an extra fall of lin. in each length to all curved and channel-pipes, and as much fall above lin. as circumstances will allow to the pipe next outlet of grease-trap.

The pipe-joints to be made in the following manner:—A strand of yarn steeped in cement grout to be wound round the spigot end to prevent the cement entering the pipe; the yarn to be driven well up the socket,* and the space between the pipe and the socket to be completely filled with Portland cement (see Fig. 3);

FIG. 3.



the surface round the socket to be worked to a smooth face; the inside of each pipe to be cleaned with a hoe and a mop after the joint is made.

31. Opercular pipe:—

Fix an opercular pipe as near the eye of sewer as possible and bed down ditto with cement, and make good over ditto after the drain is tested.†

32. Arches over drains:—

Form rough arches in walls over all drains, and leave clear space between arch and pipe; or fill ditto with earth or other compressible material.

33. Diminishing pipes‡:—

All connections of drain-pipes, and also of drain-pipes with sockets of gullies of varying sizes, to be made with proper diminishing-pipes.

34. Bends:—

All changes in the direction of pipes to be formed with proper curved bends.

35. Channel bends:—

All pipe-bends and channel bends to be of such a curve that the socket and spigot ends may fit the inlet and outlet pipe (see A¹, Fig. 1, if a straight pipe is used, or A² if a curved pipe is used). Pipes are on no account to be fitted to channel bends in the manner shown at B on Fig. 1.

36. Back flow in branch drains:—

Single junctions to be, if possible, fixed as in Fig. 4, and not as Fig. 5, to avoid back-flow into branch drains.

37. Screw-plugs:—

Inspection eyes to be fitted with expanding screw stoppers.

38. Bedding-down drain stoppers:—

Well bed down with lime and hair mortar all stoneware or metal stoppers to drains.

CAST-IRON PIPES.

39. Weights of pipes above ground:—

All cast-iron soil and water-pipes fixed above ground to be of the following weights:

Diameter. in.	Length. ft. in.	Weight. lb.
3	6 0	45
4	6 0	60
4½	6 0	70
5	6 0	82

* Some prefer to omit the yarn steeped in cement. There are various other joints, such as Doulton's improved Stamford joint, which are much used.

† Care should be taken to note and describe the treatment necessary in making the connection between the house drain and the sewer, which may vary greatly in different houses; and if the sewer is of brick, the outside of the sewer next the house may require rendering or pointing to prevent leakage.

‡ There are two kinds of diminishing pipes: one tapers in every direction, the other tapers only on the upper side

cement (Clause 7), and finished to perfectly smooth surface with neat cement.

* The architect is advised to ascertain these regulations before writing the specification, and to inquire if they are strictly enforced.

† The width of trenches may depend on the nature of the soil. In gravel or stiff clay they might be only sufficiently wide to receive the concrete—viz., 18in. for 4in. pipes, and 20in. for 6in. pipes.

* Describe here mode of fixing required for the pattern selected.

† If the soil is clay, clause C would be the best, for if A or B is used, the top of the concrete bed may become dirty, and if not perfectly cleaned the dirt would prevent the two layers of concrete from uniting.

49. Weights of pipes underground :—

All cast-iron soil and water-pipes fixed underground to be of the following weights :

Diameter. in.	Length. ft. in.	Weight. cwt. qr. lb.	Thickness. in.
3	9 4	1 0 14	...
4	9 4	1 2 0	...
5	9 4	2 0 0	1 6
6	9 4	2 2 0	1 6
7	9 4	3 0 0	...
9	9 4	4 0 14	...
12	9 4	6 2 13	...

1. Weights of rain-water pipes :—

Rain-water pipes to be of not less than the following weights :

Size. in.	Length. ft. in.	Weight. lb.
2 1/2 by 2	6 0	16
3 1/2 by 2 1/2	6 0	21
4 1/2 by 3	6 0	28

Round.

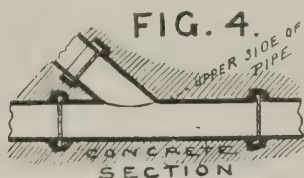
Size. in.	Length. ft. in.	Ordinary. lb.	Heavy. lb.
2 1/2	6 0	18	*
3	6 0	22	32
3 1/2	6 0	26	40
4	6 0	31	50
5	6 0	44	70

42. Pipes to be sound :—

All cast-iron soil and water-pipes to be sound and free from pin-holes and cracks, and of an equal thickness throughout. The underground pipes shall be capable of standing a pressure of 400ft. head of water, and all pipes which are burst or cracked in making the joints are to be taken out and broken up. The socket must be sufficiently large to allow of caulking the joint.

48. Rainwater pipes to be sound :—

All cast-iron rain-water pipes to be sound and free from cracks, and of an equal thickness



throughout, and all pipes which are burst or cracked in making the joint are to be taken out and broken up.

44. Joints to cast-iron soil and water-pipes :—

Joints to be made with tarred spun-yarn of an equal thickness all round the pipe, and driven into socket (care being taken that it does not enter the pipe), and caulked with molten soft pig lead to a depth of not less than from 2in. to 2 1/2 in.

45. Joints to rain-water pipes :—

Paint the spigot end and socket of rain-water pipes, and make joint with red and white lead, putty and paint ditto. two coats in addition to the painting specified for iron work generally.

46. Angus Smith's solution :—

All cast-iron soil and water-pipes to be coated with Angus Smith's solution inside and out.

47. Laying pipes underground :—

Underground iron pipes to be laid on a bed of concrete 6in. thick and 5in. wider on each side than the external diameter of the pipe, with additional thickness when required to make good clay holes, or where soft earth has been removed.

48. Fixing pipes above ground :—

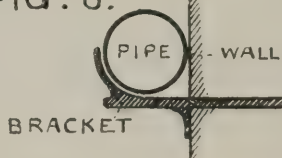
Pipes fixed above ground to be secured to the

sides of the wall with iron bracket hooks of sufficient strength to carry four times the weight of the pipe fixed into the wall (see Fig. 6).

49. Rain-water pipes fixed clear of walls :—

Rain-water pipe heads, shoes, &c., to be fixed

FIG. 6.



with ears projecting beyond the face of the wall, as shown at on the drawing.

OR. the rain-water pipes, &c., unless otherwise specified, to be fixed with all necessary heads, shoes, &c., of the following patterns,

OR. of the following P.C. values.

TRAPS, GULLIES, &c.

50. Sewer intercepting traps :—

Provide and fix in inspection chamber a sewer intercepting siphon-trap, and connect ditto with sewer with all necessary 6in. pipes.

51. Cascade action in intercepting traps* :—

All sewer and drain intercepting traps to have a drop of inches from the inlet to the standing water in the trap.

52. Gully at foot of rain-water pipe :—

Provide and fix at foot of rain-water pipe a gully with iron grating, and with an obtuse arm to receive rain-water pipe, and connect ditto with drain, and fit pipe with obtuse bend, and connect with arm of gully.

OR. provide and fix at foot of rain-water pipe a gully with iron grating, and connect ditto with drain, and fit shoe to rain-water pipe to discharge over gully.

OR. put shoe at foot of rain-water pipe, and provide and fix under ditto a Doulton's or other approved gully-channel, and a gully, with iron grating, and connect ditto to drain.

53. Traps fixed level :—

All trapped gullies to be fixed perfectly level, so as to maintain their proper seal.

54. Gullies bedded in concrete :—

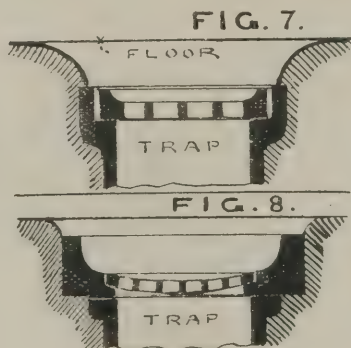
All stoneware, gullies, traps, &c., unless otherwise specified, to be bedded and cased in concrete.

55. Traps and basins of w.c.'s bedded in concrete :—

The earthenware traps and basins of w.c.'s to be well bedded and cased in concrete 6in. thick to a height of 3in. above the top of the outgo of the trap, and well grout round basin and trap.

56. Gullies fixed below level of yards :—

The gratings of gullies in yards and areas when fixed against walls to be, if possible, not



less than 2in. below the floor of yard or area, and the floor to be dished out (see Fig. 7), and gratings of gullies fixed at a distance from walls to be fixed 1in. below floor of yard or area, and the floor to be sloped to ditto with a regular fall.

OR. fix over gully below the floor a

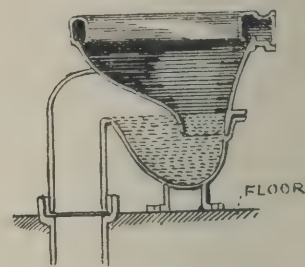
* This clause would not be necessary if the pattern to be used is specified.

. or other approved stoneware dished cover (see Fig. 8).

57. Seal of lead and earthenware traps to "wash down" w.c.'s :—

The lead and earthenware traps to "wash down" closets to have a seal of not less than 1 1/2 in., and to be of such a form that the water may stand at least 3/4 in. in an earthenware trap,

FIG. 9.



and 1 1/2 in. in a lead trap above the junction of basin and trap (see Fig. 9).

58. Inlets of traps :—

The inlets in the sides of traps for vertical pipes to be oblique right-angle inlets, to be used only for horizontal pipes.

59. Diameter of wastes and their traps :—

All lead waste-pipes and traps connected to them to be of the same diameter.

60. Waste-pipes to fit inlet of traps :—

All lead waste-pipes of a smaller diameter than the inlet of traps to which they are connected to be tapered out and flanged to fit the inlet of trap.

61. Enlarged mouth to traps :—

Traps to sinks and lavatories to have their mouths enlarged to the same diameter as the washer of sink.

62. Traps fixed directly under fittings :—

All traps, unless otherwise specified, to be fixed directly under the fittings, without any length of vertical pipe between the trap and the fittings.

63. Weeping pipe :—

To traps which are seldom charged with water, as at see plan, provide and fix from the nearest supply-pipe or waste-pipe to a 1/2 in. lead weeping pipe.

64. Running traps :—

No traps (running traps) are to be fixed in horizontal pipes.

CHIPS.

A new Wesleyan chapel at Stourton, near Leeds, was opened on Saturday. It is Italian Renaissance in style, and is built of brick. Sittings for 600 persons have been provided in area and end gallery at a cost of £2,000. Mr. Thomas Howdill, Oxford-row, Leeds, is the architect.

The memorial-stone of the Episcopalian Church of St. Saviour's, in Port Dundas-road, Glasgow, was laid on Saturday. Built of red sandstone, the edifice will, when completed, consist of nave, chancel, and vestry, and in addition there will be a hall for mission work. The nave, which is the only section of the building which will be proceeded with at once, will seat 350 people.

The memorial stone of a Congregational school chapel was laid at Staple Hill, Bristol, on the 19th inst. The estimated cost of the scheme in its entirety is £4,000, but it is proposed for the present to erect school premises only, consisting of a hall, seating 300 persons, a room for infants, and six class-rooms. The large hall will, for a time, serve the combined use of chapel and Sunday school. The estimated cost of this section of the scheme is £1,600. The school will be of simple Gothic design, built of Pennant stone, with freestone dressings, and the hall is to be floored with wooden blocks. Mr. Frank Scutt, of Bishopston, is the builder.

In order to safeguard their 11th-century cathedral from fire, the inhabitants of Drontheim purpose that the roof should be replaced by one of iron covered with copper, and have actually asked the Storting to make a grant of 100,000 kroner, or £55,000 sterling. Since 1818, the Kings of Norway have been crowned in the cathedral of Drontheim.

* These are sometimes used for soil-pipes with a caulked tow and red lead joint, but this cannot be recommended for good work.

CONTENTS.

Should Architects Take Out Their Own Quantities?	587
Openings for the Art-Workman	587
The Society of Architects	588
The Architectural Association	588
Theatres.—XI.	590
Drainage and Plumbing Specification	592
Our Illustrations	595
The Building News Directory	XIII.
Way-side Notes	614
The Powder Tower, Prague	614
The Camera Club	615
The Ruabon Brick and Terracotta Company, Limited	615
Work-a-Day Art	615
Latent Obstruction of Light	615
Building Intelligence	616
Engineering Notes	617
Competitions	617
Correspondence	617
Intercommunication	618
Legal	618
Legal Intelligence	618
Statues, Memorials, &c.	619
Water Supply and Sanitary Matters	620
Our Office Table	620
Meetings for the Ensuing Week	620
Trade News	621
Tenders	621

ILLUSTRATIONS.

WHITECHAPEL FREE LIBRARY.—NEW PREMISES, 287, STRAND, W.C.—PREMIATED DESIGN FOR NEW CATHEDRAL, VICTORIA, BRITISH COLUMBIA.—BEECH HOLME, COLWYN BAY.—A DRAWING-ROOM CHIMNEYPIECE.—ROOD SCREEN, DUNSTER CHURCH.—POWDER TOWER AT PRAGUE.—AN AMERICAN DRAWING-ROOM.—COTTAGE HOSPITAL, WILLESSEN.

Our Illustrations.

WHITECHAPEL FREE PUBLIC LIBRARY AND MUSEUM.

THIS building, which was formally opened by Lord Rosebery on Tuesday last, is erected upon a site 131ft. long and 46ft. wide, facing High-street, Whitechapel. The planning was a difficult matter, owing to there being no rights of light on the west side or in the rear, whilst some ancient lights on the east side had to be avoided. The entrance is in the centre of the front, and has on the left hand the lending library, and on the right a room for ladies and a room for boys. In the rear is the large reading-room, 45ft. wide and 69ft. long, fitted with newspaper stands and tables. Light is obtained by ceiling lights at the far end and by large windows looking into the area formed to avoid the ancient lights. A wide staircase gives access to the reference library, running the whole width of the front, and 36ft. wide. It is fitted with counter, bookcases, and lift for books. A circular staircase communicates with lending library and store in basement. Beyond the staircase is the commissioner's room and museum, the latter 45ft. long and 30ft. wide, lit by a ceiling light, and fitted with cases for the display of a collection of natural history presented by the Rev. D. Greatorex. A private staircase gives access to the librarian's residence on the second floor, facing the front. In the basement is a book-store, cellars, bookbinder's room, and caretaker's apartments. The front is faced with red Stanstead bricks and buff terracotta dressings from the Burman-totts works. A richly-modelled band runs across the whole width. The central turret contains a ventilator connected by a trunk from basement, lending and reference library. The works have been carefully carried out by Mr. W. Gladding, of Byfield Works, Mile End, the contract being £6,454, given by Mr. J. Passmore Edwards, the proprietor of the BUILDING NEWS, the *Echo*, the *Weekly Times* and *Echo*, and other journals. The museum fittings are by Mr. S. Elliott, of Newbury. The plans were selected in a limited competition, and were prepared by Messrs. Potts, Son, and Hennings, of 1, Finsbury's Inn and Victoria Buildings, Manchester, under whose supervision the whole of the works have been carried out. In the course of his able opening address on Tuesday, in which Lord Rosebery dealt at some length with the question of the diffusion of cheap literature and the revival of municipal unity, he said: I do not know again whether it is the cause of municipal life or the effect of municipal life, but we owe a great deal to the benefactors of

London—to men like Mr. Passmore Edwards. Now you have heard from your chairman how it was that, having collected a certain sum of money and being at the last gasp, you sent an emissary to Mr. Edwards, knowing his large public spirit, and instead of giving the sum you wanted, he gave the whole cost of the affair. (A voice: And 1,000 volumes of books besides.) He has given so many thousand books in London that I did not think it necessary to mention it on this occasion. But on this occasion, if I may say so, he raised and dignified his gift by the manner in which he gave it. There were no pompous paragraphs, no florid articles, no blowing of trumpets and beating of drums. He sent a note and a cheque, and the note had in it so remarkable a sentence that I ask the permission of the writer to quote it to this meeting. It said: "I cheerfully comply with your request, and I do this, not merely from a sense of duty, but because I think it a distinct privilege to assist in lightening and brightening the lot of our East-end fellow-citizens." And in another note he said: "I have long ago thought the East-end of London has stupendous, uncanceled claims on the wealthy and well-to-do people of the West-end, and it affords me unalloyed gratification that I have been able to wipe out some portion of our moral indebtedness." Well, acts and language like this find an echo in all our hearts. And you know that this is by no means the only act that Mr. Passmore Edwards has done of this kind. He has been in Bethnal-green, he has been to the Borough-road Polytechnic that I opened the other day—I don't know if he ventured to smoke on that occasion—(laughter)—he is strongly under suspicion of having been to Battersea to see the Albert Palace—in fact, wherever he goes the suspicion of benevolence dogs his footsteps.

NEW PREMISES, 287, STRAND.

THE material of this building is red brick and buff terracotta. Messrs. George Trollope and Sons are the builders, and Mr. William Young, of 6, Lancaster-place, is the architect.

CHRIST CHURCH NEW CATHEDRAL, VICTORIA, B.C.

WE illustrate this week the interior of the premiated design submitted in the competition for the above, by Mr. A. R. Scott, 19, Parliament-street, Westminster, under the motto "A.R.S." The plan, elevation, and exterior view have already appeared in our issues of June 3 and June 24 respectively. A notice of all the designs submitted in competition also appeared on page 620 of the BUILDING NEWS for May 20 last. The other designs were illustrated on May 27, June 3 and 10, and July 22. One of the premiums has been awarded to Mr. Scott, another to Mr. Wilson, of Regent-street, and the work to Messrs. Keith and Evers, of Victoria, as announced by us last month. As already stated by us, the author of this design studied the requirements, both in regard to site and the specified cost, more than any of the other competitors. He adopted an Early type of Gothic, with a certain ring of orthodoxy about it, relying for the effect which is to be obtained rather from the dignified proportions generally of our cathedrals, and that without the usual elaboration and enrichment.

BEECH HOLME STABLING, COLWYN BAY, NORTH WALES.

THE above work, which is picturesquely situated at the foot of the Pwllcrochan Woods, has recently been completed for Mr. W. H. Cogswell, of Calcutta, from the designs of Mr. T. E. Lidiard James, architect, 27, Chancery-lane, London. The materials used are red Ruabon bricks for facing, with dressings of best bed Cefn stone. The upper portion is in half-timber work, with red Broseley tiles and oak shingling for roofing. The internal fittings, which are very complete, are by Messrs. Musgrave and Co., the builder being Mr. J. B. Jones, of Colwyn Bay.

DRAWING-ROOM CHIMNEYPIECE, EAST QUANTONHEAD, SOMERSET.

THIS fireplace is one of several existing in Captain Luttrell's historic home overlooking the sea at Watchet. We gave a plan of the house as sketched by Mr. J. A. Gotch, F.S.A., in the BUILDING NEWS for August 26, when describing the visit of the Architectural Association. On that occasion Mr. John L. Robinson, R.H.A., took the photograph herewith reproduced. The whole of the chimneypiece is in plaster work,

with a panel of figures representing "Christ blessing little children." It is a typical piece of work, similar in design to much of a similar character in West Somerset.

THE ROOD SCREEN, DUNSTER CHURCH.

THE exterior of this grand church, with an interior detail, appeared in our issue for August 12, accompanied by an account of Dunster, its church, and castle. Mr. Robinson's photograph shows the exquisite screen which divided the parochial nave from the abbey choir. Mr. G. E. Street, R.A., renovated the fabric and restored this screen.

THE POWDER TOWER, PRAGUE.

(For description see article on page 614.)

AN AMERICAN NEW DRAWING-ROOM.

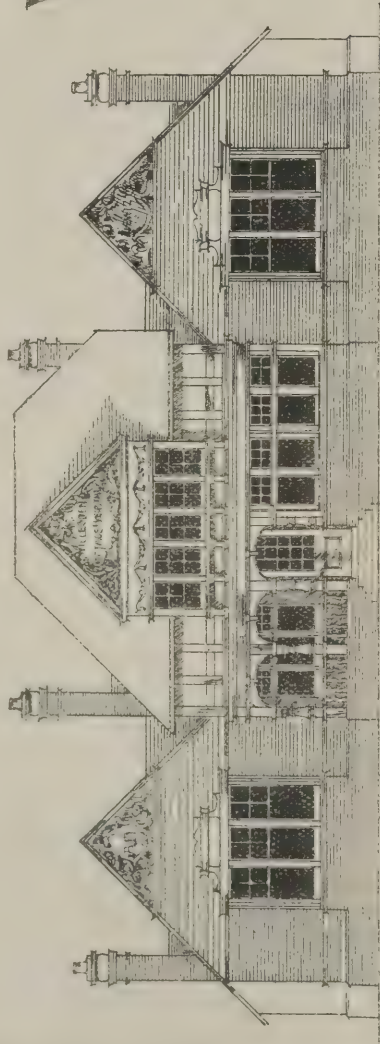
"FREE Classic in *extremis*" seems to be pretty clearly indicated by the latest phase of "advanced" design, which, from all accounts, is growing more and more popular among novelty-seeking architects, leaving the modest essays of the once fashionable "Queen Anne" style far behind with its ponderous dolorosities of form and colour. The rampant Rococo is to be the rage, and once again America, reflecting British taste, takes the lead. Whether this is the style affected most by the "architecture as an art" or "as a profession" party is not quite clear; probably the former, and, anyhow, the dash and go in the method typified by the interior herewith illustrated remain unquestioned. The architects of the drawing-room thus shown are Messrs. Delhi and Chamberlin, of New York.

THE WILLESSEN COTTAGE HOSPITAL.

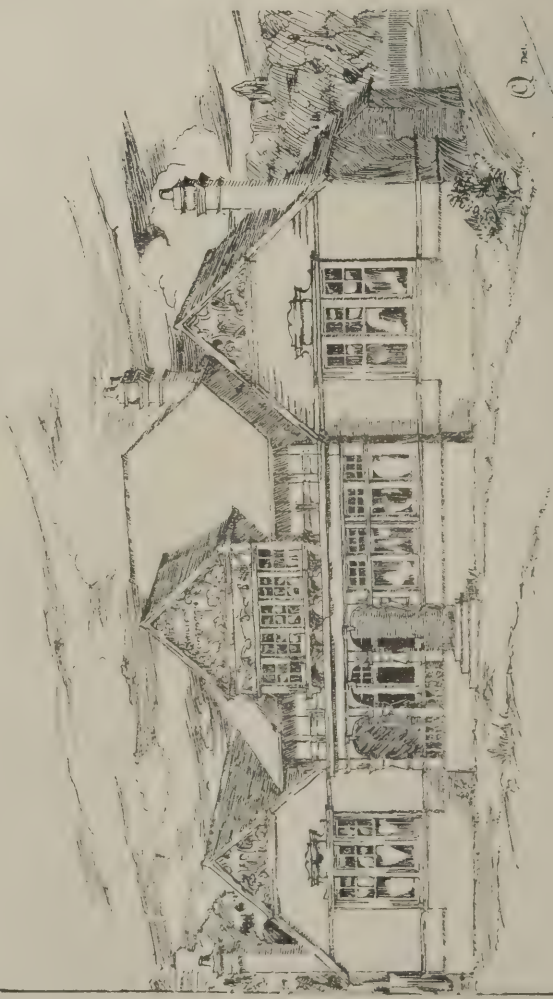
THIS building, of which we give an illustration, and which is now being erected from the designs of the architects, Messrs. Newman and Newman, of 31, Tooley-street, London Bridge, is designed to accommodate nine beds—viz., four in the male ward, four in the female, and one in the separation ward. The wards are arranged upon each side of the central entrance; they are 20ft. long and 18ft. wide, well lighted, and ventilated upon the most approved principle. At each end are the offices, entered through a disconnecting corridor. Communicating respectively with the wards are, upon the one side, the matron's room, and upon the other a nurse's room. The bath-room occupies a central position in the corridor, and in the rear are the separation ward and operating room. At the extreme end of the central corridor, and disconnected from the main building, the kitchen is placed, surrounded by the scullery, pantry, larder, &c. Upon the first floor, over the front portion of the building, three bedrooms and linen room are provided, the same being approached from the entrance corridor. Externally, the building is faced with red brick and tile hanging, the gables and first floor being treated in timber framing and rough cast. The building is being erected by Messrs. Cowley and Drake, of Willesden Green, and the cost, when complete, will be £2,000. We understand that the building is arranged with a view to future enlargements, which, from the rapid growth of the neighbourhood, will apparently soon be necessary.

At a general meeting of the hon. the trustees of the Rugby Charity, holden at the Judge's Lodgings at Warwick, on the 24th inst., the trustees appointed to the vacant surveyorship of their Middlesex estate Mr. Charles H. Bedells, F.S.I., and Mr. C. Herbert Bedells, F.S.I., practising as architects and surveyors under the well-known firm of Lander and Bedells, at 6, John-street, Bedford-row, W.C. The estate, which consists of about 180 properties in the neighbourhood of Bedford-row, adjoins the larger estate of the Harpur Bedford Charity, which since 1882 has been under Messrs. Lander and Bedells' management.

At Monday's meeting of the Maidstone town council the technical education committee reported that they had received only two sets of plans for the proposed technical school, one under the motto "Efficiency," and the other under the motto "South Kensington." Mr. Wallis inquired whether there was not some understanding come to in committee that the plans should be referred to some eminent man in London. The town clerk denied this; under the conditions the "council do not bind themselves to accept any plan, and the selection may be made by themselves or professional or other assistants, and that selection will be subject to approval by the Department of Science and Art." The plans are open to inspection by members of the Corporation, and a decision will be arrived at to-morrow (Saturday).



FRONT ELEVATION



Sketch from Road

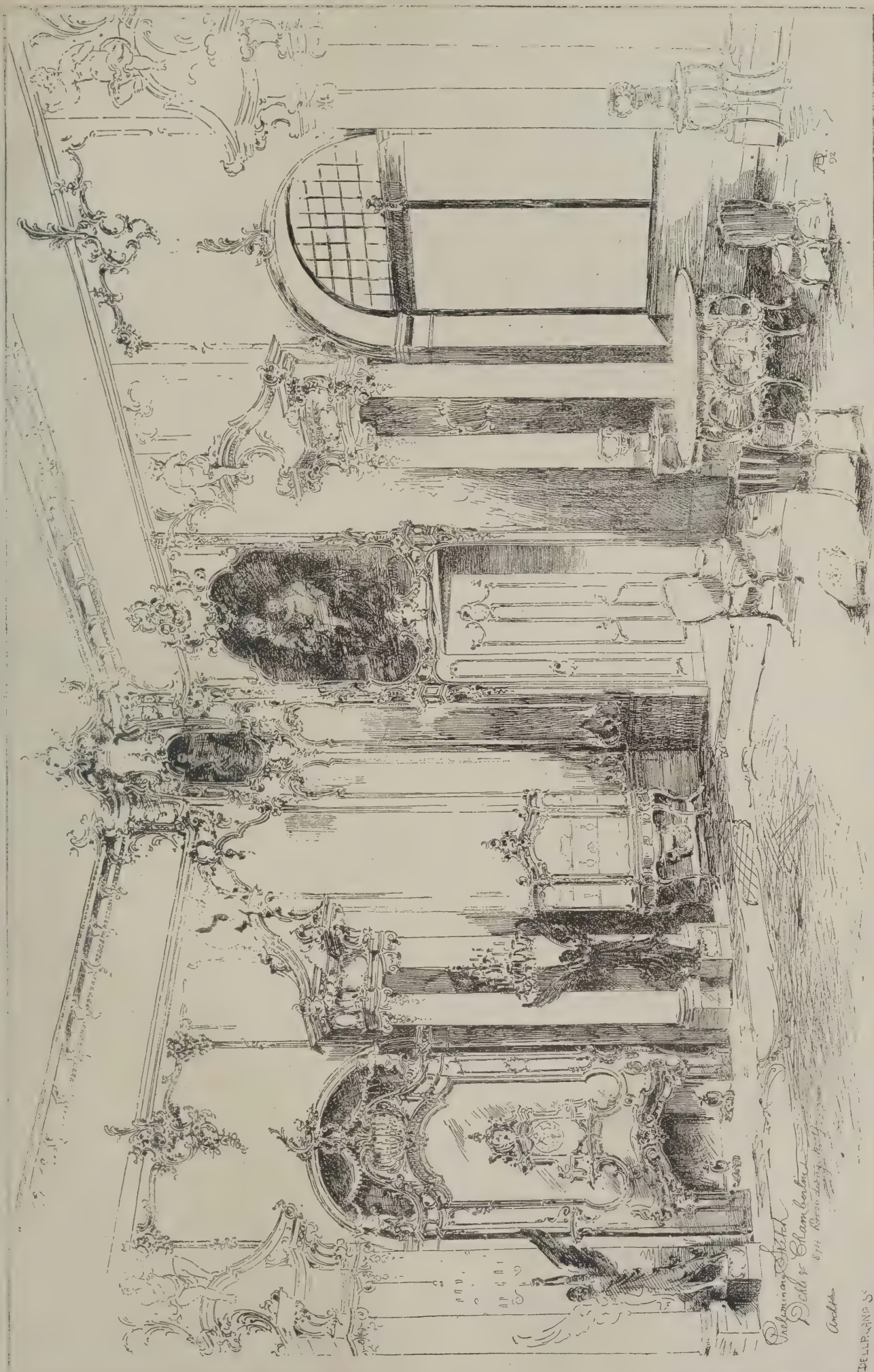
MESSRS NEWMAN & NEWMAN ARCHT^S

WILLESDEN COTTAGE HOSPITAL

Scale to Plan 4"=1"



GROUND FLOOR PLAN



*Designs by Sketch
P. & C. Blom
8714
Architect*

TELLER AND S.

AN AMERICAN NEW DRAWING ROOM. "FREE CLASSIC IN EXTREMIS."

WAYSIDE NOTES.

MR. H. O. CRESSWELL'S presidential address should be noted as a pleasant, instructive discourse, and one that put forward no unsettling theories and new-fangled ideas to lead to any radical choppings and changings, of which we have so much in this restless age. New presidents, unfortunately, so often imagine that they must be like the traditional new broom. Under a false impression that all the world and his wife expects a newly-elected president to champion trenchant reforms, and run amuck in the old pastures, such a one racks his brains for a new idea that may be applied either to the constitution or mode of conduct of the body over which he presides. This is a thing to regret, seeing that it so frequently leads to change for change's sake, the subversion of the old order, and the inauguration of novelty for its sake. It is all very well, when a new president conscientiously has some old conviction as to the best way of forwarding the interests of his particular society, that he should boldly proclaim his views even if generally unpalatable to members. In any other case a thoughtful address touching upon questions of the day in the aspect that they most affect the particular society is all that is expected of a president.

I should like not to be misunderstood in this matter, or to be believed to advocate either a stick-in-the-mud policy or a pig-headed conservatism. It is a duty to proclaim convictions when in a position of trust and honour, such as a chairman or president. Provided that all ideas are honest convictions, then the more the better. It is only ideas put forward for the sake of making novel suggestions, and being known as the maker of such suggestions, that are not required. As a writer of matter that has to come up to time, week in week out, I know it is constantly necessary to strive against the temptation to urge views that may appear new and effective in print, while at the same time making easy "copy." Unfortunately, we know that there is an immense amount of novel suggestion-making in every walk of life, particularly in political circles, where ideas are put forward, not for the benefit of the people, but the gain in notoriety to the individual.

Just now suggestions as to the grades of membership in the Institute may be good and to the point. Mr. Seth-Smith's proposal as to keeping the Fellowship for artistic members may be worth consideration. It has been suggested to me in another quarter—though, now I think of it, this may only have been the result of reading the letter you publish from Mr. Seth-Smith. Years back I advocated in these columns three grades in the Institute—Fellows, Associates, and Members. How should the "artistic" members be elected? "By acclamation," said a friend to me the other day. And a very good way this might prove. At certain times a ballot could be taken among all members for the election to the grade of Fellowship of a certain number of Associates, solely, however, on their merits as *designers of beautiful works of architecture*, and, be it observed, *such as have been carried into execution*. This should be a serious business and the result of polling the whole of the members—members here, of course, meaning Fellows, Associates, and the suggested Members. Perhaps it is doubtful whether the Members should have power to vote. In the case of three grades, the Members would be "undergrads," so to speak, and the great body of the Institute would be composed of Associates.

"It is the first step that costs," as the French architect said when he tripped over an odd and insulated riser at the head of the stairs—an afterthought—and fell down two "pairs" and landed in the sub-basement; and so the first inauguration of a scheme for three grades of membership in the Institute might be attended with some difficulty. Should the body of Fellows remain as heretofore, or should it dissolve and reconstitute itself? Providing that the Institute were agreeable to the latter arrangement, it would be the best; but, as there would probably be a precious to-do at any proposal of the kind, some other method would have to be followed. Unless the arrangement left the present Fellows as heretofore, and in the future added in the manner suggested, the only other course would seem to be

the creation of a sort of deified personage—a Superior Fellow—to whose ranks a certain number of ordinary Fellows could be elected by acclamation.

All this in case the Institute may intend any slight reorganisation. It may be that it could show all outsiders and all clamourers for new things that it knows its own business best. Doubtless it calls to mind, as we all do when outside opinion harasses us, the fable of the man, his son, and the ass, and will stand to its own guns for better or worse; in which case we cannot but look on and admire strength of purpose. As we half-expect, it may prove only to be Don Quixote and a host of rabble at the door of No. 9, concerning imaginary foes and enemies, while Sancho, in the form of the British public, ill-consents to follow the lead. Really, one makes these suggestions as to a select body of so-called artistic designers in the Institute; but what about those old members who, never having pretended to exercise cleverness in design, yet for solid worth as men and as architects, would weigh down a shoal of those who think so highly of their own attainments? Are they to play second fiddle?

This is the opinion of the Bishop of London on examinations, as given in a report of a distribution of prizes at Sion College:—"Of all means of attaining accurate systematic knowledge, there was none so good as passing through periodic examinations. An examination was one of the most potent instruments of teaching that could be devised. There was no instrument that really so disciplined the mind as to be carefully examined in what one had been previously studying."

Least pardonable of any faults in a competition is that of drawing a plan too large for the site. The grossest carelessness cannot account for such an error, and if there be "malice aforethought" in the planner, then he should be at once out of court. The whole art and the whole difficulty in the matter of planning to a certain limited area of ground lies in not overstepping the limits. It is often an easy matter to plan the required building with a few feet more space one way or another; and a very different affair to solve the problem and provide a certain amount of accommodation on a certain area. I do not wonder that there is a "Disgusted Competitor" in the Walsall Public Baths Competition.

Mr. Pearson will shortly have in hand the restoration of Rochester Cathedral. The success of the meeting at the Mansion House on Thursday may be greater or less; but at least funds sufficient for a commencement of works should be forthcoming at an early date. The scheme of restoration embraces the raising of the roofs of the choir, and its transepts up to the gables restored by Sir Gilbert Scott, and works of restoration and repair to the parapets and roof of the nave, and in the interior of the aisles and transepts. Besides this will be the "rebuilding of the upper halves of the two flanking towers, destroyed about 130 years ago," about which proposal something has been said, and about which we may hear more. We all know that ambitious schemes characterise the proposed restorations at Rochester—not necessarily referable to Mr. Pearson, but rather, I fancy, to the "authorities." A more definite term one cannot employ at the present juncture. Information as to the steps intended would be interesting to readers.

The engineers of the Totley Tunnel seem to be rather proud than otherwise that it is $3\frac{1}{2}$ miles long without a single air-shaft. It is to be hoped that they are going to make some later on. Shafts every 100 yards, about, as we find in, say, the tunnel on the line between Tunbridge and Redhill, may be unnecessary; but surely something is going to be done to ventilate this new three-and-a-half miles of blackness.

GOTH.

All visitors to Ilkley will be gratified to hear that the local board of that town have, subject to the approval of the Local Government Board, purchased the breezy moors surrounding the town, together with the picturesque fall known as Hebers Ghyll, from Mr. Middleton, the lord of the manor. The moors include an area of over two thousand acres, and the price to be paid is £14,000.

THE POWDER TOWER, PRAGUE.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

THIS rich and picturesque tower is one of the most remarkable architectural monuments in Bohemia, handed down from the middle ages. The town council of the royal city have just issued a comprehensive folio fully illustrating the building, with an account of its history and recent restoration, which has been carried out at the expense of the Corporation. The burgomaster has officially sent us a copy of the work with a permit to reproduce any of the plates, so that our readers may be made aware of the publication, for which Mr. Bernard Quaritch, of Piccadilly, is the sole agent in London, and the price is £2 per copy. We give a plan and two elevations to-day, and at an early date intend to illustrate some of the sections. There were formerly 22 towers in Prague, now there are but three, all the others having been destroyed by fire, war, and time. Most of them formed part of the 13th century city walls, and many a bloody deed has marked their history. Mathieu Reysek is said to have been the architect of this tower. Its renovation was commenced in 1875 and terminated in 1886, under the direction of Mr. Joseph Mocker, the architect. The professors of the University of Prague, aided by Mr. W. W. Tomek, Councillor of the Government, and Dr. Joseph Emler, city librarian, helped the architect in the production of the work. Mr. Antonie Tatoun, town engineer, gave his services. The statues of Charles IV. and his son Wacsalv figure in the niches over the entrance, with others of royal personages, such as Wladislav II., Georges de Podiebrady, Premysl Otakar II., and the Emperor Charles. Mr. Tomek's history of the tower given in the volume before us supplies much special information of interest to the archaeologist. This was known as the *Porte Nouvelle*, as it replaced a more ancient fabric. Charles IV. originally erected these towers to employ his starving subjects about 1353. Of this period are the black tower, and white or round tower, which served as a State prison where prisoners of rank were confined and frequently executed without trial. The Daliborka still embodies parts sufficiently perfect to give a good idea of the horrors of a Mediaeval prison. Mention appears in the municipal records concerning this tower as early as 1310. All the upper part above the parapet is new, as shown by our plate to-day; but, with the exception of the statues and arcades, which have been renewed, all the main fabric is ancient. Mr. Mocker has given drawings of the building as he found it before commencing his work of restoration. The volume is contained in a strong portfolio, and the printing, as might be expected, is worthy of the memorial undertaking.

CHIPS.

At the last meeting of the Llandudno board of commissioners, it was decided to obtain a report from Mr. John T. Wood, C.E., of Liverpool, on the scheme for the improvement of the sewerage of the town prepared by their surveyor, Mr. E. P. Stephenson, C.E.

On Saturday the foundation stone was laid of a mission church, to be called St. John's, at Caldergrove, in the parish of Crigglestone. The edifice, which is to be erected from designs by Mr. Swinfen Barber, of Halifax, is in the Early English style, and will accommodate 150 persons.

The memorial stone of a church which is being built for the United Presbyterian Church at Wardie, N.B., was laid on Saturday by Professor Calderwood. The church, which will seat 500 people, and is to cost £2,700, will be in the Middle Gothic in style. There will be no gallery, but the design will provide for the erection of one should it be needed. Mr. John McLachlan, York-place, Edinburgh, is the architect.

The corner stone of the new class-rooms, cloak-rooms, &c., about to be added to St. Thomas's Church schools, Stanningley, near Leeds, was laid on the 15th inst. The architects are Messrs. Jowett Kendall and J. Harper Bakes, M.S.A., of Leeds, and Messrs. J. Thornton and Son, of Idle, are the contractors. The work is estimated to cost £1,463 2s.

On Tuesday week the Earl of Durham opened a new parish hall for the parish of Penshaw, in county Durham. The building is in the Queen Anne style, executed in red brick and stone dressings. The hall will accommodate about 300 persons, and has cost about £650. Mr. Geo. Oates, builder, Penshaw, has carried out the work from designs of Mr. J. Gibson Cowe, architect, Fence Houses.

THE CAMERA CLUB.

THE Camera Club have a choice show of photographic pictures of the year now on view in their reading-room, which well maintains the character of their exhibitions. The subjects are chiefly of landscapes and portrait studies, with very few of an architectural interest, though Lieut. C. E. Gladstone, R.N., sends a charming detail picture of an old staircase from Mont St. Michael, and a street view in Caen, with the Renaissance spire of St. Pierre in the distance seen in full sunlight against the sombre shadow of the narrow thoroughfare in the fore part of the composition. Mr. Richard Keene contributes the doorway of the banqueting hall at Old Moreton Hall, an ever-interesting specimen of English timberwork. He likewise sends "Salisbury Cathedral from the River." The series by Mr. Shahpoor N. Bhedwar, illustrating the ordination of a youth as a Parsee priest, shows a reliable rendering of the Yacna ordinal not hitherto available to ordinary mortals. The youth passes through the "Invocation" and then the "First ablution," kneeling quite nude before the chief priest. The "Initiation" follows, then the first officiation of the novice, and at last, to use the words of the catalogue, "A Full-blown Priest" appears feeding the sacred fire, having acquired the ability of reciting the Avesta thoroughly and become acquainted with the secrets and philosophy of his faith. Mr. Ralph W. Robinson has a set of admirable pictures, the first of which shows a pair of "Young Vagabonds," which is a very fine study, all the detail of the photograph being concentrated on the boys' faces and figures, with the old cart and other accessories in a secondary rendering, subservient to the main idea of the print. The "New Pet" may be taken as a typical instance of Mr. Robinson's mastery over light and shade in his photographs without loss of necessary detail. Mr. Harry Tolley shows views from Killarney, and Mr. Van der Weyde exhibits the results obtained by an artistic use of the "photo-corrector," by the means of which the needlessly large scale of heads, hands, and feet is proportionately modified to agree with life.

THE RUABON BRICK AND TERRACOTTA COMPANY, LIMITED.

WE have before us the newly-published catalogue of this company, which in point of size and comprehensiveness exceeds other publications of the class. It is a large folio volume of 100 plates illustrating moulded bricks for one, two, and three courses in height, jambs, strings, and other purposes. Lintels, bands, panels, diapers, cornices, copings, balustrades, pilasters, brackets, chimney stacks, terminals, finials, and a variety of other details are to be found, and these are all drawn to full size. Every architect must have found the need of a book of this kind in enabling him to specify brick and terracotta mouldings and patterns which are in stock. The Ruabon Company acknowledges the assistance of Mr. Alfred Burr, F.R.I.B.A., of Gower-street, in the preparation of this catalogue. From a general glance over the plates we find many artistic designs and patterns, and as these, as in the course-mouldings and panels, can be disposed in different ways, many combinations are possible. Thus it is easy to combine many of the moulded courses to form bands and cornices. The value, too, of making the mouldings and ornament to suit the height of the brick courses has been recognised, and all the patterns are obtainable to suit the various heights and number of brick courses. All the most useful mouldings, like cavettos, cyma-rectas, toruses, and their combinations, are to be found in the early plates, and not only Classical, but Gothic, mouldings are introduced in great variety of patterns. Simple splayed and moulded jambs for 4½-in. reveals follow. The two and three-course moulded brick patterns are suitable for cornices, and for fine members half-course moulded bricks are illustrated. A very useful series are the patterns of dentils for one and two courses and half-courses, and the ornamental brick bands and jambs. The Company have studied architects' wants in the matter of key-stones, and stops to chamfers, or angle hollows for jambs, many examples of which are given. The ornament varies in merit. For diapers, and bands of two, three, and more courses in height, we refer the reader to plates 24 to 40. In some of these plates treatments of

single courses in three-course bands may be seen; also ornamental squares for brickwork of four and five courses. The designs for pilasters, caps, and bases are suitable to large or small buildings, these being also regulated by the courses of brickwork. Mullions and transoms, oriels and bay-windows, showing the jointing of mullions, cornices, and corbellings, arches and lintels of terracotta are useful examples of treatments, and the plates illustrating chimney-stack construction, gables, gateways, shop-fronts, façades, and other suggested treatments are of value to the profession, and make the Ruabon Brick and Terracotta Company's catalogue a useful book of reference.

WORK-A-DAY ART.

A LECTURE on the dignity of craftsmanship was given under the title of "Work-a-Day Art" last (Thursday) evening at the Polytechnic Institute, Borough-road, S.E., by Mr. Lewis F. Day. Mr. T. Buxton Morrish occupied the chair, and after the delivery of the address the art rooms were thrown open for inspection.

Mr. DAY said that the very existence of a Polytechnic Institute like the one in which they were assembled was evidence that labour, and the dignity of handicrafts in particular, were beginning to be recognised. Not long ago, and he feared the time was not yet altogether past, respectability was measured by a man's keeping aloof from manual labour. The reaction against this foolish notion had set in. Common sense and common manliness had always resented the *prestige* attached to doing nothing in particular, even though the *élite* might do it very well; but that resentment now found fuller expression, one of these forms being in polytechnic institutes and the demands for technical education. Perhaps in this awakening to the value of handwork and the importance of the handworker, there was just the danger of overlooking the fact that manual labour was not the only work worth doing. The thinker was also worthy of his hire, and the future of craftsmanship, the hope of the craftsman, lay in the association of brain-work with handwork. That, he took it, was the cause and intent of institutions such as that polytechnic—to help the worker to use his head as well as his hands, and so labour to better purpose. After all, it was not by polytechnics that the workman would save his soul alive. His future rested with himself. It was for him to make full and proper use of the facilities so much more readily afforded than ever they were to his forbears, and it was with the hope of helping him to help himself that he, who claimed also to be a workman, was talking to him that evening. The artisan was emerging from some of the obscurity into which he had fallen; but it was well to ask whether there was not some reason for his disrepute. It could not be denied that some who claimed the name of working man had done it in vain. If all artisans had been workmanlike, the bitter taunts against the British workman would never have been uttered. The true workman had a better answer to calumny than indignant protest, by giving it the lie direct in every stroke of his work. Perhaps some of the popular failure to understand how nearly allied handicraft was to art was because workers had not made it clear enough that their work was worthy. Their business was not to make any pretension to being artists, nor to give themselves airs of artistic superiority; but just to show by their work that a handicraft was worth following, and that craftsmanship in its fullest development rose to the dignity of art. To call handicraft "fine art" was not to dignify it, but simply to misuse words. It was not what a man styled himself, but his gift, his genius, that made his work art, and made that art sometimes a fine thing. It was a misfortune for handicraftsmen that their ambition was apt to get twisted into gauging success by its money value. It was a fine thing that our walk in life should do us credit, but a much finer thing that we, by our work, should raise and dignify our calling. A good workman could be recognised by his modesty and his pride—by his modesty in his work and opinion of his work, by pride in his lofty ideal and aim. Mr. Day passed on to refer to the delight ever felt in making any one thing well, observing that, by comparison, selling was a sordid pursuit, buying an idle one, but in making, man was at his best and manliest. What, he asked, should be the ideal of the craftsman? Not making money, not

rising in the social scale, but turning out the best and most perfect work. The ideal could not well be too high; but it should not be too far off, or the worker would despair. He would set stages to the ideal of every craftsman. One of these was the proper use of every tool handled and of every material on which he had to depend; to acquire the proper use of his hands was a long stage on the way towards good work, and could be attained by everyone possessing health and honesty of purpose, and from thence to the mastery of his craft was a further and important stretch, short of which no man should rest satisfied. But a man should go farther still, and should take advantage of every opportunity of training himself, not only in his craft, but all round. His aim in his work should be precise and definite. "Know what you are to do, and do it," was Turner's saying. Having done it, a man would want to do more if he had it in him. Good work was not mere mechanical precision. In some mechanical manufactures precision was all-important, but they scarcely came under the title of handicraft. In decoration, on the other hand, it was easy to over-estimate the value of precision, for, if too closely followed, this precision took all the life and interest out of work. The lecturer urged that while a workman must express his own ideas in his own way, he should first of all make himself acquainted with the work of others, and must not be wanting in respect for their work and their ways. A man should learn both in school and in workshop, and should endeavour to profit by both; in the former the theory of work was taught, and in the latter its practice. Neither was experience alone. The ideal training would be in a workshop where the rule was good work under the guidance of professors who knew, and of master workmen who could do; where craftsmanlike rivalry took the place of commercial competition, and thrift the place of cheapness; where the one aim was to teach the young idea good work and how to do it.

LATERAL OBSTRUCTION OF LIGHT.

A VERY frequent cause of complaint made by the owner or tenant of a house which stands some distance back from the line of frontage, is the interception of light and prospect caused by the erection of a shop in front of the adjoining house. In many of the suburban roads in the Metropolis, where front courts and gardens exist, this kind of obstruction has become very vexatious, the adjoining owner's property being seriously affected thereby. The Metropolitan Building Act permits the erection of front shops of one story in height, as we see in many thoroughfares. Edgware-road and Euston-road may be mentioned as showing examples of this kind of erection, and of the injurious effect of permitting shops to be brought out to the roadway. The London County Council would be earning the gratitude of residents and the public generally by prohibiting the construction of shops beyond a reasonable limit of the front areas. If a row of houses is set back from the roadway, say 30ft.—which many are found to be—and one owner or lessee extends his frontage for shop premises to the roadway, it will be at once seen how injuriously the adjoining houses are affected, how much light and prospect the erection would cut off. The obstructed premises, in fact, become no longer habitable for private residents, and the consequence is that before many years the whole row of houses have to be advanced to the same line. But if there was a by-law which permitted only one-half or less of the depth of the front garden or court to be so built over, the adjoining occupiers would have a wider prospect from the windows, and the angle of view and of light would be greater.

Our remarks receive additional force from the report of a case tried at the Cheltenham County Court before Judge Ellicott, "*Woodward v. Moulder*," and reported in our last issue. It was an action to recover £50 damages for an alleged obstruction of light. Up till recently the tenements in question were held by one owner; they stood some distance back from the road. The properties were sold, one to plaintiff, and the other to defendant. The latter built a shop on the front land 24ft. deep, 17ft. wide, and 11ft. high, which considerably intercepted the light received by the plaintiff. The evidence called for plaintiff showed that rather more than half the window was affected

by the shadow thrown by the wall, which would appreciably darken even the middle of the room. The defendant pleaded that the obstruction was only lateral, and merely affected a small part of a single window. An examination of the premises was made, and the judge decided that there was an appreciable diminution of the light, and that the house was less commodious than it was, and the damage was assessed at £30. In this decision the judge said the former common ownership of the houses did not affect the question. It makes no difference whether the owner sold two houses to different persons or only one house and adjoining land; in neither case is the purchaser of the land, with or without the house upon it, entitled to build so as to obstruct the ancient lights of the adjacent house—a wholesome and just law. This law of prescriptive right of light and air appears to be the only protection that an adjoining owner has against a building-owner who has no consideration for his neighbour. The local authorities apparently did not make any objection to the erection of the shop, nor does any local by-law we know of prohibit the erection of such a building on the front area. The subject is one that becomes more pressing every year both in provincial towns and in London. A local by-law limiting the bringing out of such buildings in cases where there is a considerable area in front, and in other cases of prohibiting such erection, is called for in the interests of owners and the public. Lateral obstruction of a window does not appear to have been always considered in these erections. The adjoining owner has to prove by evidence there is an appreciable diminution in the light entering his front room, but it may be sometimes difficult to do this, as the principal light enters the window above the one-story building. Thus it often happens that the adjoining and aggrieved owner cannot prove a substantial injury by this means, and although his property has greatly suffered, and his front room on the ground floor is spoilt entirely by the hideous blank wall of the adjoining shop. Local authorities should, therefore, have some power to limit lateral obstructions, which project beyond the windows of adjoining houses, and which reduce a very appreciable angle both of prospect and light.

CHIPS.

The local board of New Swindon have decided to purchase the local gas undertaking at a cost of £51,400.

The business of patent glazing and zinc roofing hitherto carried on by the late Mr. Helliwell will be continued as usual under the style or title of Helliwell and Co. by the acting executors, Mr. J. Boosie and Mr. W. Kemp, both of whom were associated with the late Mr. Helliwell in the conduct of the business for many years.

Mr. A. P. I. Cotterell, A.M.Inst.C.E., has been called in to prepare a new scheme of sewage disposal for the town of Milborne Port, Somersetshire.

A new clock at Purston, near Pontefract, has been fixed on the Junction Hotel at the junction of the Purston, Ackworth, and the Pontefract highways. Messrs. Potts and Sons, of Guildford-street and Cookridge-street, Leeds, are the makers.

The endowed school, Frodsham, is being warmed and ventilated by means of Shorland's patent Manchester grates, exhaust roof ventilators, and inlet-tubes, the same being supplied by Mr. E. H. Shorland, of Manchester.

The east window of the parish church of St. Michael, Brent Knoll, Somerset, has just been filled with stained glass. The principal lights are occupied by the three Archangels. St. Michael is represented in the centre with a spear, in the act of treading upon the dragon. St. Raphael as a pilgrim, while St. Gabriel bears the lily of the Annunciation, and the first words of his message, "Ave Maria," on a scroll. Under these are represented smaller accessory figures in medallion panels. The work has been carried out by Messrs. Wailes and Strang, of Newcastle-upon-Tyne.

Among the Parliamentary projects for next session is one to be known as the East Fife Central Railway. The line is to start from Leven, and run past Dunifene on to Kennoway. From thence it goes past Balgrummo, Burnside, Netham, Nether Pratis, on to Bonnyton, where a junction is to be formed. The one line branches off by Teuchats on to Ceres, and proceeds on to Dairsie, where it joins the present main line. The other part goes by Gileston Mains on to Largoward, Lochty, and Stravithie, where it joins the present Anstruther and St. Andrew's Railway.

Building Intelligence.

COVENTRY.—The foundation stone of the public baths was laid by the Mayor on Thursday in last week. It will be remembered that in the competition for designs Mr. Harold T. Burgess, a pupil of Messrs. Spalding and Cross, architects, of London, won the first premium of £100, and his plans were accepted by the Baths Committee, though, on account of his not having attained his majority, his employers were appointed joint architects with him. The baths are situated in Priory-street, and the accommodation to be provided will be three covered swimming baths, each 90ft. by 35ft., a plunge bath or "soap hole," ten first and twenty second-class men's private baths, and four first and six second-class ladies' baths, superintendent's residence, with offices, a boiler-house, laundry, drying-room, &c. The building will have a frontage of 132ft., and a depth of 236ft. The front block will comprise offices and superintendent's residence. There are separate entrances for ladies and gentlemen, with pay-office between. All the bathing accommodation is provided on the ground floor. The three swimming baths are behind the front block. Two will be spanned by separate iron roofs, and the third by a wooden roof, and each will be inclosed by walls. Fifty dressing-boxes will be provided for use in connection with each of the first-class swimming baths, and fifty-eight for the second-class bath. The chief front will be faced with best red bricks, with Portland stone dressings. The staircases will be of concrete. The internal walls, and the inside of the swimming and plunge baths will be faced with glazed white bricks with lines formed of bricks of another colour. All passages and floors to the front block, boiler-house, and laundry will be fire-proof. Mr. C. Gray Hill is the builder, his contract amounting to £16,380.

EDINBURGH.—The new chancel added to St. Paul's Episcopal Church, York-place, Edinburgh, was recently dedicated. The church, as originally designed, consisted of a nave, north and south aisles, and a short chancel 15ft. long. The nave consisted of five bays of a total length of 78ft., with a gallery over the entrance at the west end, in which was placed the organ. The galleries were continued over the aisles, with access stairs flanking the main entrance at the west end. In carrying out the alterations, the architects, Messrs. Kinnear and Peddie, have kept in view, as a guiding principle, the preservation of the original features of the church as far as possible. In designing the new chancel, the original east termination of the church has therefore been preserved, merely extending it by the distance required for a chancel in keeping with the length and other proportions of the nave. The galleries have been removed and the space formerly occupied by the stairs added to the nave, which is now one bay longer than before. The new chancel is equal in length to three bays of the nave, about 50ft., and the organ is now placed in a bay next the nave, with stone piers and arches opening to the chancel and the south aisles. Beyond it is the clergy vestry, and below is the choir vestry. Under the chancel there is a choir room. The church has been re-seated, and oak choir and clergy stalls have been placed in the chancel. The glass of the original east window has been transferred to the west window, and the east window and south-east chancel window have been filled with stained glass by Messrs. Heaton, Butler, and Bayne. The organ has been reconstructed by Messrs. Bishop and Son, London.

KIDDERMINSTER.—The Countess of Dudley on Saturday laid the foundation stone of the new nave and chancel of St. John the Baptist's Church, Kidderminster. The existing church, an unhappily-coloured edifice, built in 1843, of Broseley bricks, will be partly merged in the new buildings, and the present nave will become a south aisle of the future structure. On the north of the present building there will be a lofty nave, with chancel, and a new north aisle will flank the new nave, and add to the proportions and accommodation of the church. Mr. J. A. Chatwin, of Birmingham, is the architect. The work has been divided into sections, the first being the erection of the new nave, north aisle, and west porch. The contract for this work is £4,565, and it has been entrusted to Mr. T. Collins, of Tewkesbury. The second portion of the work, which will include the chancel, north porch, and

vestries, will, it is estimated, involve a further expenditure of £2,548 10s. The new building is to be erected with Alveley stone, and the remaining parts of the old structure will also be cased externally with the same material, and thus give harmony to the whole.

LEEDS.—Extensive alterations are about to be carried out at Oxford-place Chapel, from plans prepared by Mr. G. F. Danby and Mr. Wm. H. Thorp, architects, of Leeds, at an expenditure of about £3,000. The chapel now provides seating accommodation for about 2,000 people. The front facing Victoria-square is to be entirely remodelled. The central portion of the façade is to be slightly projected from the main block of the building. It will be surmounted by a pediment rising above the main eaves cornice, which will be supported by three-quarter columns, with capitals, and entablature of the Ionic order. Flanking the pediment on either side are to be cupolas. These will be carried out in masonry and brickwork, with domed roofs of wood, covered with lead. The main angles of the building are to be treated with rusticated quoins in alternate courses of stone and brickwork. A Venetian window of three lights will form the central feature on the upper story, and circular-headed single windows, will be ranged on either side. An additional double entrance will be provided in the centre of the façade, the doorways to be surmounted by an entablature and carved pediment, supported upon projecting columns with Roman Doric capitals. It is also proposed to improve the blank walls by providing a new eaves cornice, a moulded string-course at the first floor level, and also new windows. The work will be executed in local faced bricks of a deep red colour. The dressings will be of stone. The style will be the English Renaissance of the Wren period. The interior of the chapel is also to be remodelled. New and wider entrances will be made to the area, where the whole of the deal pews will be replaced by modern seating, executed in pitch-pine. The existing mahogany pulpit is to form the central feature of a rostrum. The seating accommodation in the gallery is to be improved. The whole of the windows in the building will be reframed and reglazed, new heating apparatus introduced, and a Boyle's air-pump ventilator provided.

LEIGH WOODS, BRISTOL.—The new church of St. Mary, at Leigh Woods, built at a cost of £4,000, was opened last week. The contract has been carried out by Messrs. R. Wilkins and Sons, of Bristol, from plans by Mr. John Medland, of London. The church is in the Early English style. It is constructed of Pennant stone from Stapleton, with freestone dressings. It consists of a simple nave, without aisles or pillars, and a chancel apse-like in form. The nave is lighted by deeply recessed dormer windows, placed between the principals of the roof. The roof is of open timber work. The floor is laid with pitch-pine blocks. At the north-west corner is a recess to be used as a baptistery. In the chancel over the altar are three windows, filled with stained glass, representing scenes in the life of Christ, and executed by Mr. W. G. Reid. The floor is paved with plain and ornamental tiles. There is an organ chamber on the south of the chancel, but at present it is unoccupied. The seating for the congregation consists of specially made rush-bottom chairs, and that for the choir and clergy of oak benches. The pulpit, lectern, and altar table are also of carved oak. The warming is by hot-water pipes. There is a large vestry on the north-east side of the church, which will also be used as a parish room. All the doors are of oak, with hinges and other fittings of wrought iron.

MANCHESTER CATHEDRAL.—The levelling of the entire floor of the nave of Manchester Cathedral is at last completed. All the former sittings in the centre and north side of the nave, and all the pews in the Trafford Chapel and in Brown's Chapel, on the south side, have been cleared away. In the centre the space has been covered with chairs, and a similar course will be taken on both the north and south sides. The new south porch is also practically completed, while the new baptistery chapel, at the south-west end of the nave, is on the eve of completion.

OXFORD UNIVERSITY MUSEUM.—A large addition is being made to the University Museum for the department of Human Anatomy. The extension is on the east side of the main building abutting on the parks, and the main entrance is on the north front. In the basement there is a

tank-room, 60ft. by 29ft., a working lobby, 5ft. by 21ft., inspection-room, preparation-room, coal-cellar, attendant's rooms, general stores, and the usual offices. The principal rooms on the ground floor are the dissecting-room, 60ft. by 30ft.; museum, 30ft. by 40ft., two private rooms, vestibule, prosecutor's room, and a lecture theatre, the latter being 30ft. square. The museum has a gallery running all round at the height of 11ft., and both that and the dissecting-room receive light through the roof from the north side only, to avoid the glare of the sun, Rendle's patent system of glazing being used. The microscopical room, which is 18ft. by 30ft., is on the first floor, where there are also two assistants' rooms. At the north-east angle of the building is a large lantern over the lecture theatre, together with a ventilating shaft, and the principal features in the north elevation are the octagon turret, and the gables and dormers over the windows. The chief decorative work, however, is the window lighting the museum in the east elevation, some handsome balustrading being also placed round the lecture theatre. The stone is Box Ground from Bath, and pugging is used between the principal floors to deaden the sound. The builders in charge of the work are Messrs. Symm and Co., the architect being Mr. H. Wilkinson Moore, Beaumont-street, and the clerk of the works Mr. R. England.

ROCHESTER.—A meeting in aid of the Rochester Cathedral Restoration fund was held at the Mansion House, E.C., yesterday (Thursday) afternoon. The chair was taken by Alderman Davies, the member for Rochester, and the speakers included Earl Stanhope (Lord Lieutenant of Kent), the Bishop of Rochester, and Dean Hole. The restoration now in progress was initiated many years ago, and in part carried out under the supervision of the late Sir Gilbert Scott. The members of the Chapter have found funds for a considerable amount of work done in late years; but unfortunately there is no special fabric fund, and a public appeal is now being made in order that the work may be continued under the advice of Mr. J. L. Pearson, R.A. A few years ago the west front was found to be in a perilous condition demanding immediate underpinning repairs. These are in a fair way of completion, and it is proposed to rebuild the upper portions of the two flanking towers destroyed about 130 years ago. The scheme includes the raising of the roofs of the choir and its transepts up to the gables which Sir G. G. Scott restored. It includes, also, works of reparation and restoration in the parapets and roof of the nave, in the interior of the aisles and transepts and elsewhere.

STEPNEY.—The new church of St. Philip, Stepney, was consecrated yesterday (Thursday), by the Bishop of Wakefield. It has been built from plans prepared by Mr. Arthur Cawston, at a cost of £40,000, entirely borne by the vicar, the Rev. Sidney Vacher. It replaces an old edifice, built in the Debased Perpendicular style of the early part of this century, and consecrated in the episcopate of Bishop Howley. The new church is on a large scale, cruciform on plan, with apsidal eastern termination, and is built of red brick, with Ancaster stone dressings. The style is Geometrical Early English, and it has a clerestory, triforium, and vaulted roof. Beneath the church is a large, light, and dry crypt, which forms a series of halls and vestries for parish purposes. Amongst them is a depot for outfits for emigrants.

A Local Government Board inquiry was held on Wednesday week at the Guildhall, Dartmouth, by Mr. T. Codrington, M.L.C.E., relative to the Town Council's application for permission to borrow £6,000 for water supply works, and £650 for works of sewerage. The borough surveyor explained the details in the plans.

The reconstructed Potter Bridge, Reydon, on the road from Southwold to Wrentham and Lowestoft, was opened for traffic last week. The new bridge stands on a foundation of concrete, with brick abutments and wings. The superstructure is of steel girders with buckled plates between, the whole being covered with concrete. The parapets are formed of cast-iron standards and wrought-iron rails, with brick piers and stone copes. The width of the roadway is 18ft. and the water-way is 14ft. The bridge was designed by, and its erection carried out under the superintendence of, Mr. H. Miller, County Surveyor, the work of construction being done by Mr. W. J. Chilvers, of Wangford, the steel portions being supplied and fixed by Messrs. Knights and Stacy, of Harleston.

Engineering Notes.

THE CORNWALL RAILWAY.—The Great Western Railway are proceeding with the doubling of the Cornwall Railway. Tenders were recently invited for laying a second line of rails over the $4\frac{1}{2}$ miles between Par and St. Austell. That contract has now been let to Mr. Strong, contractor, for about £7,000. Specifications and drawings are now to be seen at the offices at Millbank, Plymouth, for doubling the line between Liskeard and Lostwithiel—about $14\frac{1}{2}$ miles. The tenders for this section are to be sent in by the end of October, and it is stipulated that the work shall be completed within twelve months. There will then remain the short section between Lostwithiel and Par in the way of a clear run from Liskeard to St. Austell. Here, however, there is a wooden viaduct to be rebuilt in stone.

DORE AND CHINLEY RAILWAY.—The Topley tunnel of the Dore and Chinley line of the Midland Railway, which will connect Manchester and Sheffield by a better route, was pierced on Sunday evening, when the men working from the Sheffield side met those engaged in the work of excavating from the Padley Woodend. The tunnel will be the longest in the British Isles, with the single exception of that under the Severn. It is 6,200 yards long, or over three and a half miles, and its working has taxed all the resources of engineering skill. The difficulties of setting have been exceptional. There are only four shafts, all situated within the first three-quarters of a mile. The remaining distance of two and three-quarter miles is at present without a shaft. In spite of this difficulty, which was increased by the fact that the height of the hill over the tunnel is, at its summit, 750ft., and 1,360ft. above sea level, a tunnel has been made straight from end to end. The work has been greatly impeded by intrusions of water, as the strata through which the boring took place favoured flooding. The tunnel, the roof of which is 20ft. high above the rails, is 27ft. broad, and will accommodate a double line of rails. It is being lined with brickwork. At one portion of the Padley end stone was available, and was used for the walls, bricks being employed for the roofing arch. A culvert runs from end to end. The gradient rises from the Sheffield side, so that a train at the Padley end will be 76ft. higher than one at the Topley or Sheffield mouth. Most of the work has been carried out by air-drilling apparatus, the air being conveyed in 4in. pipes, and, as it escaped, affording ventilation for the workings. The Cowburn tunnel, two miles in length, will be finished this year, and it is expected that the whole line from Dore to Chinley will be opened for goods traffic about 12 months hence.

COMPETITIONS.

ROTHERHAM.—The designs submitted by Mr. Richard J. Lovell, of 46, Queen Victoria-street, E.C., for the Rotherham public baths have been placed first, and those of Messrs. Magnall and Littlewood, of 29, Brown-street, Manchester, are awarded the second place. We hope to illustrate the chosen design at an early date from the architect's drawings, which have been promised us.

STOCKTON-ON-TEES.—At a special meeting of the School Board for Stockton, held on Monday, the Higher Grade School Committee recommended, on the advice of Mr. E. R. Robson, F.S.A., architect to the Education Department, the adoption of the plans of Mr. J. M. Bottomley, of Middlesbrough, for a higher grade school. This was agreed to; but it was decided to obtain tenders for the main building only at present, and to omit the two wings. The cost of carrying out the plans in their entirety will be about £20,000, exclusive of the outlay on the site (£6,500). The cost of the buildings, exclusive of the site, was originally estimated at £10,000 by the board.

ST. SAVIOUR'S, SOUTHWARK.—In the competition (limited) for new baths and washhouses, St. Saviour's, Southwark, the following were the competitors:—Messrs. Spalding and Cross, Messrs. Harnor and Pinches, Mr. Elkington, Mr. A. Hessel Tiltman, and Mr. Fras. J. Smith, of 17b, Great George-street, S.W. Mr. Fras. J. Smith's designs have been selected. We have not heard how the second and third premiums have been awarded.

Correspondence.

MOTTISTON MANOR HOUSE ILLUSTRATION.

To the Editor of the BUILDING NEWS.

SIR,—Among the medley in Mr. Norman Shaw's book, Mr. Reginald Blomfield figures, I see, as a trenchant essayist, aiming ostensibly at truth in art, midst a "disingenuous," "unlicensed abuse" about the "impertinence" and the "bathos of professionalism" which darkens the door of the "orthodox professional head-quarters" in Conduit-street, where art and science meet together and business proficiency is guaranteed by Royal Charter. All this tall talk contributes but little really to anyone's information, though, underlying much of the high-falutin, are a few truisms, such as the undoubted advantage of sketching constantly good specimens of old work. Mr. Blomfield's own sketch of Mottiston Manor House, which you published last Friday, shows that he can draw, no doubt, with dash and feeling, if without any idea of distance in colour. The unfortunate part of his drawing, however, is its absolute disregard for hard facts; indeed, the relative proportion of things is as over done here as in his writing. He pretends to give a truthful view of the house among a series of old buildings from the Isle of Wight. The plan and elevation given below his sketch show at once how entirely misleading and incorrect it is. The east elevation gives the relative heights of the main building and the wing, the latter being much lower than the former. Mr. Blomfield, correcting works of the past as he goes along, alters all this, dodging in some darker shading in the upper part to modify the alteration. If he had not pretended that this sketch actually represented the house, no one could blame the draughtsman, but he has allowed his craze for art seemingly to tamper with his rectitude, making his study profess to be what it actually is not. Is professionalism answerable for this?—I am, &c.,
AN OLD TREE SQUARE.

EPITAPHS.

SIR,—I send you the following on Mr. Nightingale, Architect:—

As the birds were the first of the architect kind,
And are still better builders than men,
What wonders may spring from a Nightingale's mind,
When St. Paul's was produced by a Wren.

Another, which, I think, is better known, is at Gateshead, and erected apparently to the memory of another architect:—

Here lies Robert Trollop,
Who made yon stones roll up;
When death took his soul up
His body filled this hole up.

This man was the architect, it is said, of the Exchange and Town Court of Newcastle.

Was it not Pope who wrote the epigram on Sir John Vanbrugh?—

Lie heavy on him, earth! for he
Laid many heavy loads on thee.

I don't know whether any other architects have been thus permanently recorded, if so perhaps some of your readers may be able to acquaint us.—I am &c.,
October 20. Ed. A. JOLLYE, A.R.I.B.A.

WALSALL PUBLIC BATHS COMPETITION.

SIR,—I wrote to the Walsall borough surveyor, Mr. H. Middleton, on the subject of the proposed public baths, and drew his attention to the statement in your last week's issue, that the selected architects in this competition had none of them complied with the conditions of the competition. Mr. Middleton has replied to me this morning that the statements in the papers are incorrect.

There is, therefore, some mistake one side or the other, and the only solution to the doubt will be for the council to publish the three selected designs.

I wrote to the town clerk on the subject, and he has promised to put the matter before the town council.

I shall be glad if you will insert the above information in your next for the benefit of the competitors in this competition.—I am, &c.,
October 25. A COMPETITOR.

SIR,—As a competitor in the above competition, and also one who has complied strictly with the

conditions of the competition, to say the least, it is most discouraging to know that the selected designs are not the best of those sent in, and also that none of the selected designs have fulfilled the conditions of the competition. If this statement is not correct, it is clearly the duty of the Council to remove all doubt at once.

There were 25 sets of plans sent in, and taking six weeks as the time spent by each competitor with an ordinary day's work of ten hours per day, at the very low rate of, say, 2s. 6d. per hour, brings out the cost of one set to £45, so that £1,125 of labour has been spent upon these designs—considerably more than the proposed cost of the entire building.

It is affirmed that:—1. Two of the three premiated designs will not go on the land, the first encroaching on the land reserved by the council for the erection of shops. 2. The design placed third takes in 3ft. of land on the left-hand side of the site. 3. Neither the first nor the second designs has separate entrances to the female slipper-baths. 4. There is only one entrance to design No. 1, over which coals and everything have to be taken. 5. No provision for replacing the boilers is made.

If the above are facts, then there has either been some unfairness, or there has been gross negligence in the selection of the best designs. On the other hand, if the whole thing is a misrepresentation, then it can be put right at once by publishing the selected designs in one of the building papers, which I have already suggested should be done.

I am sure all architects who are in the habit of going in for competitions do not mind being beaten, providing the successful man has produced something better. But if an inferior design is adopted, it is not only unfair to the competitors, but detrimental to the interests of the Walsall ratepayers.—I am, &c.,

H. W. R.

"BRICKS."

SIR,—I am indebted to Mr. Wm. Theobalds for his letter in your last issue, corroborating the statements of my article, "Bricks and Joints in Brickworks," in the "B. N." of the 14th. inst. He is, however, in error in believing that Fletton bricks, by the process of machine pressure, have all moisture taken out of them; this has to be done by the ordinary process of drying and firing. I quite agree with him with respect to "a good hard London stock," and from personal experience and observation, believe it to be almost imperishable—even in an atmosphere like that of London.—I am, &c.,

F. WALKER.

CHIPS.

A new Primitive Methodist chapel at Leybourne, near Louth, was opened last week. It was designed by Mr. John Thompson, and built by Messrs. Harrison Brothers, of Louth.

New Turkish baths at 461, Brixton-road, S.W., were opened last week. Mr. W. A. Large, of Chester-square, was the architect, and Mr. W. King, of Vauxhall Bridge-road, the contractor.

A new Roman Catholic church has just been commenced at Ilfracombe. It will consist of nave and apsidal chancel, 58ft. by 25ft., and will be built of blue Welsh stone, with Ham Hill stone dressings.

The new Home for Female Inebriates at 2, Millbank, West Derby, Liverpool, was formally opened on Friday by Mrs. W. E. Gladstone. The premises, which will accommodate 22 persons, were purchased, and have been altered to serve their new purpose. The work has been executed by Messrs. Eaton and Bulfield, Tuebrook, under the superintendence of the architects, Messrs. Cox and Marmon, Sweeting-street, Liverpool.

Messrs. Baird, Thompson, and Co. have introduced an installation of their latest improved combined automatic and mechanical system of ventilation into the Municipal Buildings of Oldham.

At a meeting of the committee in charge of the arrangements for the restoration of St. John's East Parish Church, Perth, held on Monday, it was stated that the cost of the alterations will amount to £1,450. It was recommended that the work be gone on with at once.

The London County Council discussed on Tuesday the recommendations of the Parliamentary Committee in respect to the construction of a new street from Holborn to the Strand. The scheme was approved several months ago, but certain additions were now proposed. Several of these points led to considerable discussion, but by narrow majorities all the recommendations were adopted.

Intercommunication.

QUESTIONS.

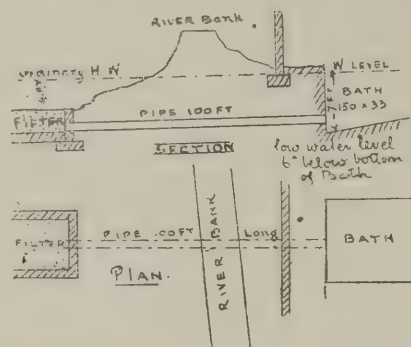
[10876].—**Cistern.**—I have lately seen a lead-lined rain-water cistern, which was lined with new 8lb. lead about six years ago, and which is now eaten away and perforated by small holes in a most extraordinary manner. The rainwater has been passed through copper gutters and pipes, and thence into this cistern. Will someone kindly inform me if the fact that the water has come into contact with the copper has anything to do with the speedy decay of the lead, and if so, an explanation will greatly oblige.—TEOTON.

[10877].—**Post-mortem Room.**—Can anyone inform me as to the following, viz.: 1. Best material for floor of post-mortem room? 2. Best material, size, shape, &c., for table? 3. Ought wall to have a Portland cement or white glazed tile dado, about 4ft. high and plaster above?—H. G. W.

REPLIES.

[10876].—**Boasting.**—If "One Who Wishes to Learn" will visit a stonemason's yard where freestone is prepared he would be shown a broad chisel about an inch wide, called a "boaster." Faces—and, in good work, beds and joints—are finished with this tool, and the work is specified "with boasted face, beds, and joints," as the case may be.—N. JOYCE.

[10852].—**Tidal River Bath.**—In reply to "N. B. D."



I inclose sketch as suggested, and thank him for his interest in the matter.—TIDAL WAVER.

[10875].—**Drainage of Dwelling-Houses.**—Owing to some error in transcribing or printing, the latter part of my question is stated incorrectly, and should read as follows: "It appears to me that the risk of unsealing the closet-trap by siphonage, evaporation by inconstant use, leakage through cracked earthenware, or other cause, is constant and great, and in such event the house becomes at once the exhaust for the drains."—P.

[10869].—**Tennis Courts.**—I should say cement on concrete would be better for the floor than gravel. Portland stone paving is often used. The best size for court is said to be 110ft. long, 40ft. wide, and 3ft. high. I presume I have understood the question aright.—G. H.

The opening of the new School of Applied Art at the Royal Institution, Edinburgh, took place on Friday night. Lord Kingsburgh presided. Dr. Rowand Anderson, director of the new school, gave an address, explaining its aims and objects, and the points whence it differed from existing art schools. Other speakers were Mr. Hippolyte J. Blanc, A.R.S.A., Mr. J. Birnie Rhind, and Mr. W. Wybrow Robertson.

A mission church and church institute is being erected at Kemblesworth, a rising colliery village, Durham, the foundation stone of which was laid on Monday week. The buildings are being erected in red facing bricks with stone dressings, in the Early English style, from designs by Mr. J. Gibson Cowe, architect, Fence Houses, at a cost of about £1,200, the contract for the whole of the work being let to Mr. Jennings, Chester-le-Street.

A new Roman Catholic Church at Bassalleg, near Newport, Mon., was opened last week. It is built of blue Pennant stone, with freestone dressings, and consists of nave, sanctuary, and organ chamber. There is a bell turret. Seating accommodation is furnished for 150 persons, and attached are the resident priest's house and a class-room. The architect was Mr. Gardner, of Newport, and the builder Mr. L. Hall, Maidee. The cost was £1,000.

At a meeting of the executive council of the Shakespeare Memorial Association, held on Friday, at Stratford-on-Avon, Mr. Algernon Graves informed the council that his late father, Mr. Henry Graves, the well-known print publisher, of Pall Mall, had, by his will, bequeathed ten valuable oil-paintings, all Shakespearian subjects, and 100 engravings, forming the Boydell Collection, to the Memorial Association, the pictures and engravings forming part of a loan collection now in the Memorial Gallery. Mr. Algernon Graves also presented as his own gift a painting of Mr. and Mrs. David Garrick, by Zoffany.

Legal.

STREET WORKS EXPENSES.

SO important is the Street Works Act, 1892, that it may be usefully referred to once more for the special purpose of directing attention to the clauses it contains as to the expenses of paving and making good new streets. Beyond the old power of recovering apportioned expenses summarily as before, section 13 now makes these expenses a charge upon the premises in a clear and unmistakable way with interest at the rate of 5 per cent. per annum. It further provides that the urban authority shall have all the same powers and remedies for the recovery of such sum and interest under the Conveyancing Act, 1881, and otherwise, as if they were mortgagees having powers of sale and lease, and of appointing a receiver. In order that an authentic record of these matters may be available, the clause goes on to provide that the urban authority shall keep a register of all charges under this Act, and of payments made thereunder, which is to be open for inspection by the public for a fee of one shilling in respect of each name or property searched for, while copies of the register are to be supplied on proper payment. This is, of course, the right way of doing the business, and when this is in order, any intending purchaser or mortgagee will be able to discover by a simple search whether or not the road, &c., has been paved and paid for, or whether any and what sum remains charged on the premises.

Section 15 gives the urban authority power to resolve to contribute the whole or a portion of the expenses of private street works out of the district fund. This clause apparently places it in the power of such boards to pay half, or some of the cost of paving, out of the rates; and there may be cases in which such a course of conduct might be desirable and advantageous in the public interest. By section 16 the urban authority is to have the apportioned expenses, which would otherwise fall upon churches, chapels, or other places of public worship, or the burial grounds attached, and which are to be exempted from such expenses where they are already exempt from poor rates. Again, in section 22 we have a new and special provision to the effect that no railway or canal company shall be deemed to be an owner or occupier for the purpose of this Act, which only abuts but does not communicate with streets that are chargeable with these private street expenses. This clause is guarded with provisions, and is not to apply to streets in existence on the adoption of the Act. But, all the same, it is a striking change in the law, as they have hitherto been liable for such improvement expenses; and though sometimes fair, it might often work out very hardly upon adjoining owners.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

LEGAL INTELLIGENCE.

SERIOUS CHARGE AGAINST A BUILDER.—At West London Police-court on Tuesday Frederick Banyard, a builder, was brought up on remand charged with the commission of certain offences under section 11 of the Debtors Act, 1882. In the early part of the year 1882 the prisoner was in partnership with a man named George Pearce. They traded as builders and contractors in the neighbourhood of Willesden, and it was alleged that a sum of £100 was obtained from a Mr. Memory, who had employed them to erect stables and other buildings, for the purpose of paying the workmen. The men were, however, not paid, and on the same day the furniture of both partners was removed. Subsequently proceedings in bankruptcy were taken, but no information was given by the debtors. Pearce was apprehended shortly afterwards, and was convicted. Banyard could not be found, and it was only recently, when he failed in another name, that he could be found. Mr. Grain asked the magistrate to commit the prisoner for the non-discovery of the £100, and the non-delivery of the furniture. He said there would be an indictment for conspiracy. The prisoner was committed for trial, bail being allowed.

IN RE C. R. GURR.—Charles Richard Gurr, builder, against whom a receiving order was granted on the 7th inst., states that in March, 1891, having then about £200 capital, he commenced the erection of

houses at St. Dunstan's-road, Fulham, but was eventually unable to carry them out. In or about December following the properties were realised, and, after payment of the advances, the net proceeds were applied in making payments to his unsecured creditors, in pursuance of a composition arrangement previously come to. He states that he was previously and has since been employed in his trade as a foreman bricklayer, taking sub-contracts. He attributes his insolvency to loss (£100 to £500) by the building speculation, and to loss in respect of a house at Shirland-road, Paddington. The statement of affairs discloses gross liabilities £1,060, of which £720 are unsecured, without available assets. The debtor makes no proposal, and has been adjudged bankrupt.

POOR CONCRETE.—At Lambeth Police-court on October 19th, Charles Watts, builder, Lower Kennington-lane, appeared in answer to five summonses, issued by Mr. Ellis Marsland, district surveyor for Camberwell, for having, in the construction of houses in Worlingham-road, East Dulwich, covered the site with other than a layer of good concrete at least 6in. in thickness. Mr. Biron, who had personally visited the houses, pointed out to the defendant that the material should be absolutely impervious to moisture. He ordered the defendant to pay a fine of 20s. and 2s. costs on the first summons, and a fine of 1s. and 2s. costs on each of the other summonses.

EXTRAORDINARY CHARGE AGAINST A LOCAL BOARD SURVEYOR.—On Tuesday week at the Southport Petty Sessions Mr. Thomas Lloyd, surveyor to the Southport Local Board, was charged at the instance of Mr. S. Zachery Lloyd, J.P., with stealing one load of clay, of the value of 1s., from Arelley Wood. When the case was called, complainant's solicitor said he wished to withdraw, as he now understood that the clay, which was the subject of the summons, was used for the purposes of the Local Board, and not for the private use of the defendant. His client had suffered great depredations by reason of persons taking sand and clay, and the bailiff, on information given, saw the defendant and asked him what he had been taking the clay for, and then he offered to pay for it. Investigations since made showed that the clay was needed for public purposes, and not for the private use of the defendant. He was instructed to ask that he should be allowed to withdraw the summons, and if necessary they would proceed against the defendant for trespass. Defendant's solicitor said the alleged robbery took place on September 20, and the summons was not taken out till September 30, so that ample time for consideration was given. His client had a complete and overwhelming answer to the charge, and if all the facts had come out before the Court, they would have felt the greatest indignation against the prosecutor. Case dismissed, with costs to defendants.

IN RE J. H. GARDEN.—At the Brighton County Court on Friday application was made for the discharge of a debtor, John Henry Gardner, of 5, Queen's-road, builder. His solicitor said the chief liabilities were incurred in connection with a brickfield, at Harrow, debtor having reason to believe he would be financed by a solicitor. Since the failure of the brickfield there were no debts which could be attributed to debtor's trading when knowing he was insolvent. Judge Martineau said he found continued trading to the end of 1889, when debtor was unquestionably insolvent; he found that books had not been kept, and that debts had been incurred while debtor had no reasonable expectation of paying them. There were liabilities of £3,297 and assets nil, and he did not think debtor should be allowed to go into business at once. The order would be one of five years' suspension, or for discharge forthwith on 10s. in the pound being paid.

EMPLOYERS' LIABILITY ACT.—On Thursday, Oct. 20, at the Clerkenwell County Court, before Judge Eddis and a jury, Willick Sallick, navy, sued E. O. Woodhead, builder and contractor, of 1, Alexandra-villas, Alexandra Park-road, for £240, compensation for injuries, under the Employers' Liability Act. The plaintiff claimed damages for injuries sustained by him by the falling of a wall on him at certain buildings in the course of being pulled down by the defendant, in Cromer-street, Grays' Inn-road, in January last. The wall fell on the plaintiff's legs, and since the accident he has been unable to follow his occupation. The jury found a verdict for the plaintiff for £180.

BAD MORTAR.—At Bromley Petty Sessions last week, George Pullen, builder, Penge, was summoned at the instance of the Beckenham Local Board for using mortar in building certain houses there which was not of the constituent parts prescribed by the local board's by-laws. Evidence was given to show that the mortar used by defendant contained under 4 per cent. of lime, the remainder being loamy fibrous matter, and entirely devoid of sharp sand. After the testimony of Mr. Carston, A.I.C.E., surveyor to the board, who took samples of the mortar while the premises were in course of construction, Dr. Adams, county analyst, said good

mortar was composed of one part of good lime to three of sharp sand as a minimum. None of the numerous samples taken from the defendant's building contained more than 10 per cent. of lime, and they broke off like snuff. Evidence was given to show that the mortar was good in the opinion of working bricklayers, but the Bench decided to inflict a penalty of £17 15s. 6d., including expenses, or 28 days. Defendant said he could not pay.

IS A GLASS HOUSE A BUILDING?—CORPORATION OF LEICESTER V. FRANK BROWN.—(Appeal Court, October 23, before Mr. Baron Pollock and Mr. Justice Hawkins).—This was an appeal by way of special case stated against a conviction for building a certain wooden building, with a glass front, beyond the front main wall of a house, without having obtained the written consent of the urban sanitary authority, as provided by the 156th section of the Public Health Act, 1875. Frank Brown, the appellant, was a photographer, and carried on his business in a house at the corner of the London-road and Coburg-street, Leicester. On April 26 this year he put up a structure 30ft. beyond the front of his house. This was a glass case, in which he placed photographs as an advertisement to his business, which was carried on in the house. The case was of wood, 9ft. 6in. long, 3ft. wide from back to front, and 7ft. high. It was roofed over, and had a glass front and a door to enter by at one end. The structure was fastened to the ground by four posts, forming part of the structure, and let into the ground to the depth of 9in. to 12in. The structure was large enough for a man to walk about inside. The house itself had no shop window on the side on which this structure was, and it served as such. The magistrates held that this structure was a building within section 3 of 51 and 52 Vict. chap. 32, and convicted the appellant. Mr. Rawlinson for Brown, cited a number of decisions in actions in which structures had not been held to be buildings—"Moore v. Williams," "Stevens v. Gourley," "Slaughter v. Mayor of Sunderland," "Brown v. Local Board of Holyhead." Mr. Toller, for the respondents, the corporation, argued that this structure came within the spirit of the Act, and relied on the case of "St. George's, Hanover-square v. Sparrow." Mr. Baron Pollock said that the conviction must be confirmed. No authority had been cited that in any way fettered the Court's discretion. In "Hibbert v. Acton Local Board" there was an expression of opinion that a conservatory was not a building, but that was on the construction of an Act which provided for the solidity of buildings which should be erected, and provided that they should be solidly built of brick or stone. Such a provision, if construed to apply to a conservatory, would make them useless, and prevent their being erected. The case in which a wooden movable pay-box was decided not to be a building was on the ground of its movable character and nature. In the present case the building was not movable, but its object was to assist in the carrying out of the business of a photographer. The object of the Act in using the words "house or building" seemed to contemplate such a structure, for it was to keep a free passage of light and air in the street. Everybody knew the sort of erections that were to be seen in urban districts, sometimes being cages for keeping animals or birds, and these might possibly not be buildings; but a structure of the dimensions of this one might be. It was not removable, being sunk into the ground. Mr. Justice Hawkins: If I were here to decide as a juror whether this was a building or not, I might come to a different conclusion; but, as the law says, if there is a difference of opinion as to whether it is a building the magistrates are to decide, and as they have exercised a reasonable discretion, and come to a reasonable conclusion, I do not think it ought to be interfered with. It is difficult to draw a line, and each case must depend on its own circumstances as to what is a building.

New blocks of constabulary barracks are being erected facing the municipal building at Bradford. They will accommodate upwards of 100 men, and are provided with recreation rooms and baths, as well as the necessary dormitories and drill courts. The buildings are of plain brickwork, with no ornamentation.

The other day the directors of the North-Eastern Railway Company, accompanied by their engineer, Mr. Harrison, had a thorough inspection of the new line of railway now being constructed from Annfield Plain to a junction of the Team Valley line between Chester-le-Street and Birtley. Messrs. Whittaker, contractors, of Leeds, have the work in hand, and the railway, when completed next year, will provide travelling facilities to what has hitherto been a part of Durham County rather difficult of access. The lines, which are to be double, will be seven and a half miles long, and will pass Annfield Plain, Shield Row, Beamish, and Pelton, with stations at each of these places, to the Team Valley Junction.

STATUES, MEMORIALS, &c.

DURHAM.—The altar-tomb erected as a cenotaph memorial to the late Dr. Lightfoot, was unveiled in the choir of the cathedral on Thursday in last week. The monument, which is in the style of the fifteenth century, is composed of alabaster, with moulded base, string, and cornice of a dark-grey marble. It contains panels of alabaster, three in each side, and one at each end, all filled with moulded and cusped quatrefoils bearing shields charged with the arms of the diocese of Durham, Lightfoot, and Durham and Lightfoot impaled. The marble cornice has, in brass let into it, an inscription in Latin from the pen of the Bishop of the Diocese. Above the cornice is laid the effigy, in white marble, of the late Bishop, who is represented in the episcopal robes, the hands folded over the breast, the feet resting against three books. The model for the effigy was made by the late Sir Edgar Boehm, Bart., and was nearly finished at the time of his sudden death, after which the work was taken up and completed by Mr. Alfred Gilbert, A.R.A. The altar-tomb has been made by Messrs. Farmer and Brindley, of London, from the design of the Cathedral architect, Mr. C. Hodgson Fowler, F.S.A., M.A.

OXFORD.—A chamber is in course of construction at University College, Oxford, for the reception of the Shelley Memorial, presented by Lady Shelley. A cast of the monument itself was exhibited in the Royal Academy this year. It is the work of Mr. Onslow Ford, A.R.A. The chamber, which is designed by Mr. Basil Champneys, the architect, is being made in that part of the college that lies between the old buildings and what are called the new, behind a long piece of wall on the High-street. The chamber will not be visible from the street, as it will be sunk below the level of the ground. It will be lighted at one end from a glass cupola, beneath which the monument will rest. At the other end will be a platform for the spectators. Mr. Ford's work consists of a figure in white marble of the poet as he may be supposed to have lain when washed up by the sea. It is on a bronze pedestal, supported by lions, between which a muse is seated.

CHIPS.

The dissolution of partnership is announced between E. Richards and F. P. Harrison, under the style of Richards and Harrison, of Torquay, architects.

The well-known Tolbooth Free Church, Edinburgh, has been sold to the Scottish banks for a "clearing-house," for the sum of £14,000.

The Bishop of Chichester laid, on Friday, the foundation-stone of a tower and ante-chapel at St. John's College, Hurstpierpoint, one of the schools of Canon Woodard's foundation. A sermon was preached by the Bishop of Southwell.

The new public park at Colchester was opened on Monday by the Lord Mayor of London. The park comprises the ground round the Castle, together with the contiguous meadows which lead down to the river, the entire area being about 17 acres.

The redecoration and cleansing of the roof of the City Guildhall has just been completed. The work has been carried out by Messrs. Mowlem, under the direction of Mr. A. Murray, the city surveyor.

The new municipal buildings at Saltecoats, N.B., erected at a cost of £4,000, was opened on Friday.

At the restoration of St. John's Church, Milbourne Port, near Sherborne, in 1867, under Mr. Henry Hall, of Doughty-street, W.C., the Ham Hill stone capitals to the arcades and the blocks supporting the external pinnacles were left uncarved. Funds have recently been raised for the completion of the work, which has been carried out from Mr. Hall's designs by Messrs. Harry Hems and Son, of Exeter.

The magistrate at the Wandsworth Police-court on Wednesday week imposed fines amounting in the aggregate to £21 14s. upon an owner of cottages in White-square, Clapham, for neglecting to put his property in a sanitary condition. The defendant had rendered himself liable to penalties of £420.

At Tuesday's meeting of the General Purposes Committee of the Bangor City Council the plans of a new pier it is proposed to construct at Garth were submitted by Messrs. Mayo, Manchester.

The new flagstaff which is to bear the Royal Standard at Windsor Castle was successfully stepped on Saturday afternoon. Four Maundy coins obtained from the Mint were deposited under the butt before it was lowered into position. Five days were occupied in the preparations and in the lifting of the flagstaff to its elevated position on the Round Tower, the work, which was difficult and trying, having been superintended by the Castle master gunner. The pole is 72ft. in height, and is of Oregon pine.

The Society of Merchant Venturers have voted £1,000 as their contribution to the restoration of Bristol Cathedral.

WATER SUPPLY AND SANITARY MATTERS.

ABERDEEN.—The town council of Aberdeen have adopted a report by Mr. Gale, C.E., for improving the supply of water to the city. Under the scheme filters will be constructed at Invercarnie at an estimated cost of £30,000; a settling pond, £20,000; distributing mains £17,000; and service reservoir at Kittybrewster, £5,000—the total estimated outlay being £72,000. The works will be carried out under the direction of Mr. Dyack, burgh surveyor. It was resolved that a Bill should be promoted in the ensuing session of Parliament seeking power (1) to compel the County Council of Aberdeenshire to treat by irrigation the sewage of all the villages along the course of the Dee, and (2) to provide proper filter beds and settling ponds for the whole supply of the city. The committee further resolved to institute a thorough investigation as to the present excessive waste of water and the means for its prevention, since in this way a considerable saving of expenditure could be effected.

BALMORAL AND RIVER POLLUTION.—It should at once be said that Balmoral has fared somewhat unfortunately in connection with the question of the pollution of the Dee. It was the only mansion house against which complaint was made when others were offending quite as badly, and it is the only place, mansion house, or village where anything has really been done to remedy or mitigate the evil. It was not denied that pollution existed at Balmoral. But when complaint was made, Dr. Profeit, Her Majesty's Commissioner, had a report drawn up by a resident engineer, and by an eminent consulting engineer, Professor Ivion Macadam, of Edinburgh, and at once set afoot "the best practicable and available means to render harmless the sewage matter." A considerable sum has been spent in these operations, and it is only fair to say that there is no doubt whatever that a Rivers Pollution Commissioner would pass the new arrangements as sufficient to meet the requirements of the Act.

HAUXLEY AND TOGSTON WATER SUPPLY.—The new waterworks for the townships of Hauxley and Togston, in the Alnwick Union, have just been completed for the rural sanitary authority. A new settle-well and 25,000-gallon covered service reservoir has been built near the 21-gallon spring, and over eight miles of 4in. and 3in. cast-iron socket pipes have been laid down to supply a population of 1,600. The main was laid across the River Coquet, at the paved ford near Warkworth Mill, when the water was only a few inches deep at the time. The first four pipes were jointed together and then laid in the river with one loose end on the land and the socket end supported just above the water, and then the fifth pipe was jointed on and then let into the water, leaving the end out ready for the sixth pipe. This process was repeated with each pipe, the men working in the water, until the river was crossed with 24 pipes in all. The open end on the north bank was then connected to the main with a loose collar, and on the southern bank the pipe laying proceeded in the usual manner. The works have been executed by Mr. John Carrick, of Durham, from plans prepared by Mr. M. Temple Wilson, of Alnwick, Northumberland. Mr. J. A. Huston, of Caton, was clerk of the works.

OLDHAM.—Mr. Arnold Taylor, C.E., an inspector under the Local Government Board, held an inquiry at the Town Hall, Oldham, on Friday, into an application made to them by the corporation for leave to borrow £200,000, to be expended on sewerage works. The works proposed to be constructed comprise a system of sewers passing around the boundaries of Oldham, with the object of intercepting the existing sewers, and conveying the sewage thus intercepted to a site adjoining the site of the sewage works of the Chadderton Local Board, where it will be dealt with by filtration. This scheme has been prepared by Mr. Law, C.E., of London. Practically no opposition was raised at the inquiry to the works proposed, or to the borrowing of the money by the corporation.

A discovery of Roman remains has just been made at Westernmain Sandpit, near Kirkintilloch, about 7 yards behind the line of the Roman wall. The finds include a cist of sandstone, a vase of reddish clay, a spearhead, and some human bones.

The employes of David Davies, builder, of Cardiff, who are now engaged in the erection of the new town hall and market hall for Tredegar, died together at the Tredegar Arms Hotel on Friday night. Among those who responded to toasts were Mr. Davies and the clerk of works, Mr. Edward Morgan.

Sir George Humphry, Professor of Surgery at Cambridge University, has presented to his native town of Sudbury, Suffolk, a portrait of himself and a portrait of Mr. G. W. Andrewes, who has been an alderman of the borough from the passing of the Municipal Corporations Acts in 1835, and was its mayor both in the year of the Queen's accession and of her Jubilee.

Our Office Table.

MR. ASTON WEBB, the hon. secretary of the R.I.B.A., has resigned in consequence of his inability to attend to the duties of the office, owing to the great pressure of his professional work. The council have nominated Mr. William Emerson, a member of the council, to the vacant office, and the election, which is little likely to be contested, will be announced on November 21. A more popular or able hon. secretary than Mr. Aston Webb has never held office, and Mr. Emerson will in every way make a worthy successor to the post.

ANOTHER step has been taken this week towards the acquirement for the people of the Albert Palace at Battersea. It will be remembered that this handsome building, which cost for erection £150,000, and is only separated by a roadway from Battersea Park, was recently offered for sale at £20,000. While the local authorities were hesitating as to whether the ratepayers would endorse their action if they purchased, an anonymous donor offered to buy the palace if the Battersea Vestry and the London County Council would undertake its maintenance. The Battersea Vestry held a special meeting on Wednesday evening to consider the question, and by a large majority decided to vote their quota. The London County Council can now scarcely decline to do the rest, and we should hope the acquisition of the Palace for the benefit of the public may now be regarded as a settled fact.

It is expected that the work of removing Alfred Stevens's monument to the Duke of Wellington, from the Consistory Chapel at St. Paul's to a space beneath the easternmost arch on the north side of the nave of that cathedral, will be completed early in 1893. The work of reconstruction will be begun in about a fortnight's time. The work of removal has been carried out under the direction of Mr. Penrose, Surveyor of the Fabric. Mr. George Shaw, who has acted as mason, has had the invaluable aid of Mr. F. Doughty, who worked with Alfred Stevens for five and a half years, and who practically put up the monument. The bronzes have been removed by Mr. Young, the founder who cast them. From an anonymous friend, Sir Frederic Leighton has received a cheque for £300, the sum needed to complete the amount necessary for the removal of the monument.

We regret to learn that the Legislative Council of Victoria has rejected the Architects' Registration Bill promoted by the Royal Victorian Institute of Architects on its second reading. Nominally the opposition was promoted on the ground that the measure would create another close profession or trades-union, the present majority of the Council priding itself on being the special guardian of freedom of contract; but the discussion revealed that the real opponents of the Bill were the Builders' and Contractors' Association, who feared that such a law would militate against their interests. Some architects also thought the Bill too stringent, and objections were raised in the course of the discussion to clauses 39 and 43, one of which provided that after six months from the appointment of the Registration Council, no person not registered as an architect should be able to recover any charge for professional services, while the other stipulated that after the same period no expert evidence should be given in courts of law, unless by special consent, except by registered architects. The feeling against professionalism seems to be general just now in the Victorian Legislative Council, for only a few weeks ago the Medical Bill was rejected on similar grounds. We are informed by correspondents in Melbourne that the present government is by no means firmly established, and next session an amended Architects' Registration Bill will be introduced under more favourable auspices.

SIR JOHN B. MONKTON, town clerk of the City of London, in presenting the prizes and certificates granted by the Worshipful Company of Plumbers, London, to the students in the plumbers' classes at the Durham College of Science, Newcastle, said he knew and appreciated a piece of good plumbing, for a piece of bad plumbing was a very insanitary and a very bad thing. Of all craftsmen, he supposed the plumber was the man who worked most in the dark. He burrowed behind walls and under

ground, and was, in fact, so to speak, always out of sight. There was, perhaps, no trade which afforded such opportunities for "scamping work," and there was no craft the work of which, if scamped or badly executed, was so utterly dangerous to humanity. Therefore, he thought it was fair to draw the logical conclusion that there were few crafts which were more important to the well-being of the public if properly carried out than the plumber's craft. Men who were conscientious in that work could therefore feel that their good work was appreciated.

MEETINGS FOR THE ENSUING WEEK.

FRIDAY.—Architectural Association. "Notes on the Application of an Architectural Education," by William Young. 7.30 p.m.

The Architectural Association, 9, Conduit Street, W.; and 58, Great Marlborough Street, W.

THE ARCHITECTURAL ASSOCIATION COURSES OF LECTURES, CLASSES, and STUDIO INSTRUCTION are now commencing.

The Courses are both Elementary and Advanced, and are designed to provide a sound professional education, supplementary to that to be obtained by the prevailing system of pupillage. The Course, which is in four divisions, is progressive and consecutive, and the instruction is given by Lecturers and Instructors of known ability.

DIVISION I.

LECTURES and CLASSES.—The Orders of Greek and Roman Architecture, Building Materials, Perspective, Physics.

THE STUDIO.—Drawing from Ancient Examples, Freehand Drawing, Drawings of Examples of Elementary Construction, Plane Geometry, Criticism Meetings.

DIVISION II.

LECTURES and CLASSES.—English Architecture, Materials, Elementary Ornament and Colour Decoration, Strength of Materials, Stresses and Strains.

THE STUDIO.—Designs based upon Ancient Examples, Freehand Drawing, Drawings of Examples of Elementary Construction, Solid Geometry, Criticism Meetings.

DIVISION III.

LECTURES and CLASSES.—The History of Architecture, Materials, Colour Decoration, Sanitary Science as applied to Drainage and Water Supply.

THE STUDIO.—The Design and Construction of Modern Buildings, Freehand Drawing from Casts, Perspective and Sciography, Constructive Masonry, Criticism Meetings.

DIVISION IV.

LECTURES and CLASSES.—The History of Architecture: Sanitary Science—including Ventilation, Lighting and Heating, Painting, Sculpture; other Arts allied to Architecture; Professional Practice—including Legislative Enactments relating to Building Contracts.

THE STUDIO.—The Design and Construction of Modern Buildings, Freehand Drawing from Casts, Drawings of Ancient Buildings from actual measurement, Graphic Statics and Perspective, Criticism Meetings.

EXTRA SUBJECTS.

LECTURES and CLASSES.—Plane and Solid Geometry, Geology, Mensuration, Land Surveying and Levelling, Chemistry of Building Materials, Quantity Surveying—including the Preparation of Estimates, Discussion Section.

THE STUDIO.—Sketching and Measuring, Elementary Water Colour Class, Water Colour Class, Modelling.

A Pamphlet, containing full particulars of the curriculum, may be obtained free on application to the Hon. Secs., at 58, Great Marlborough-street, London, W. Fees must be paid in advance, and passes may be obtained at the Offices of the Association, between Ten a.m. and Seven p.m.

ERNEST S. GALE, } Hon. Secs.
F. T. W. GOLDSMITH, }

CHIPS.

The dissolution of partnership is announced as between A. G. Lavender and J. Wells, of Glasshouse-street, Piccadilly-circus, architects and surveyors.

The Glasgow Police Commissioners decided on Monday to erect baths and washhouses for Springburn district on a site in Wellfield-street, at an estimated cost of £11,000.

The local board of Smethwick have approved of plans prepared by Messrs. Harris and Harris, of Birmingham, for the completion of the sewage of West Smethwick. The present works will involve a further cost of £5,000, bringing the total outlay to about £20,000.

New offices are being built at Blackburn for the proprietors of the *Northern Daily Telegraph*. The premises occupy a corner site, and are faced with red bricks, with buff terracotta dressings, while the roofs are covered with green slates. Messrs. Stones and Gladwell, of Blackburn, are the architects, and Messrs. Highton and Son, of the same town, are the contractors. The outlay on building and machinery will exceed £20,000.

The death occurred at Padstow, last week, of Mr. James Vivian, retired builder of that town. Deceased, who was in his 80th year, had taken an active part in all public movements in the town, and for about 60 years had been a worker among the local Wesleyans. He was vice-chairman of the Padstow Local Board, and had also served on the local school board.

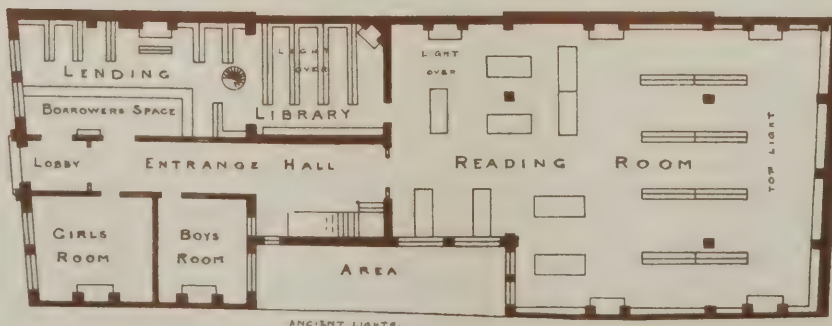
The Town Council of Birkenhead have confirmed the arrangement made with Mr. T. C. Thorburn, the borough surveyor, who has retired, that he shall be appointed consulting surveyor at a salary of £250 a year. They have decided to offer candidates for the vacant office a commencing salary of £500 clear of all office expenses, but with no claim for superannuation or pension in the future.

WHITECHAPEL FREE PUBLIC LIBRARY AND MUSEUM:

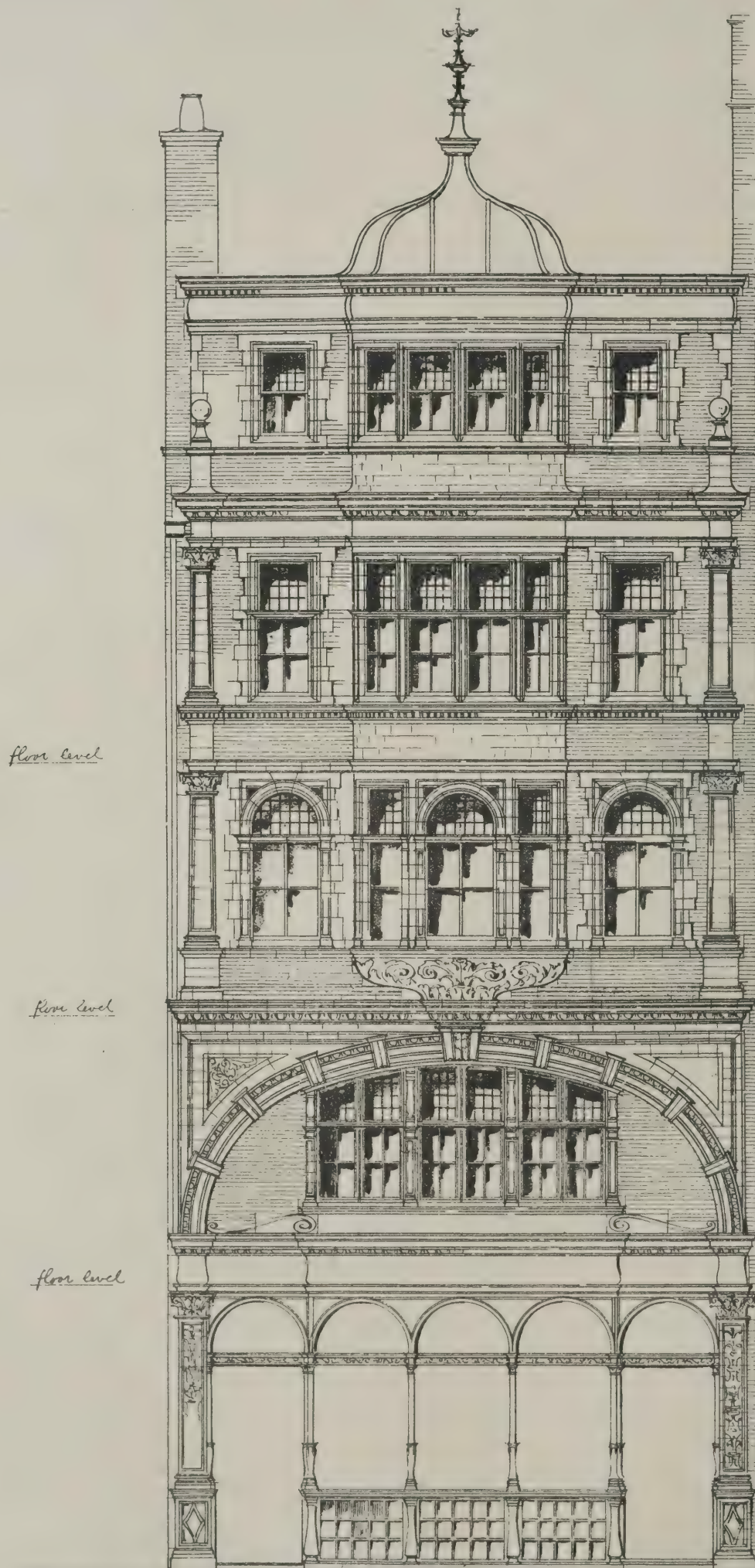
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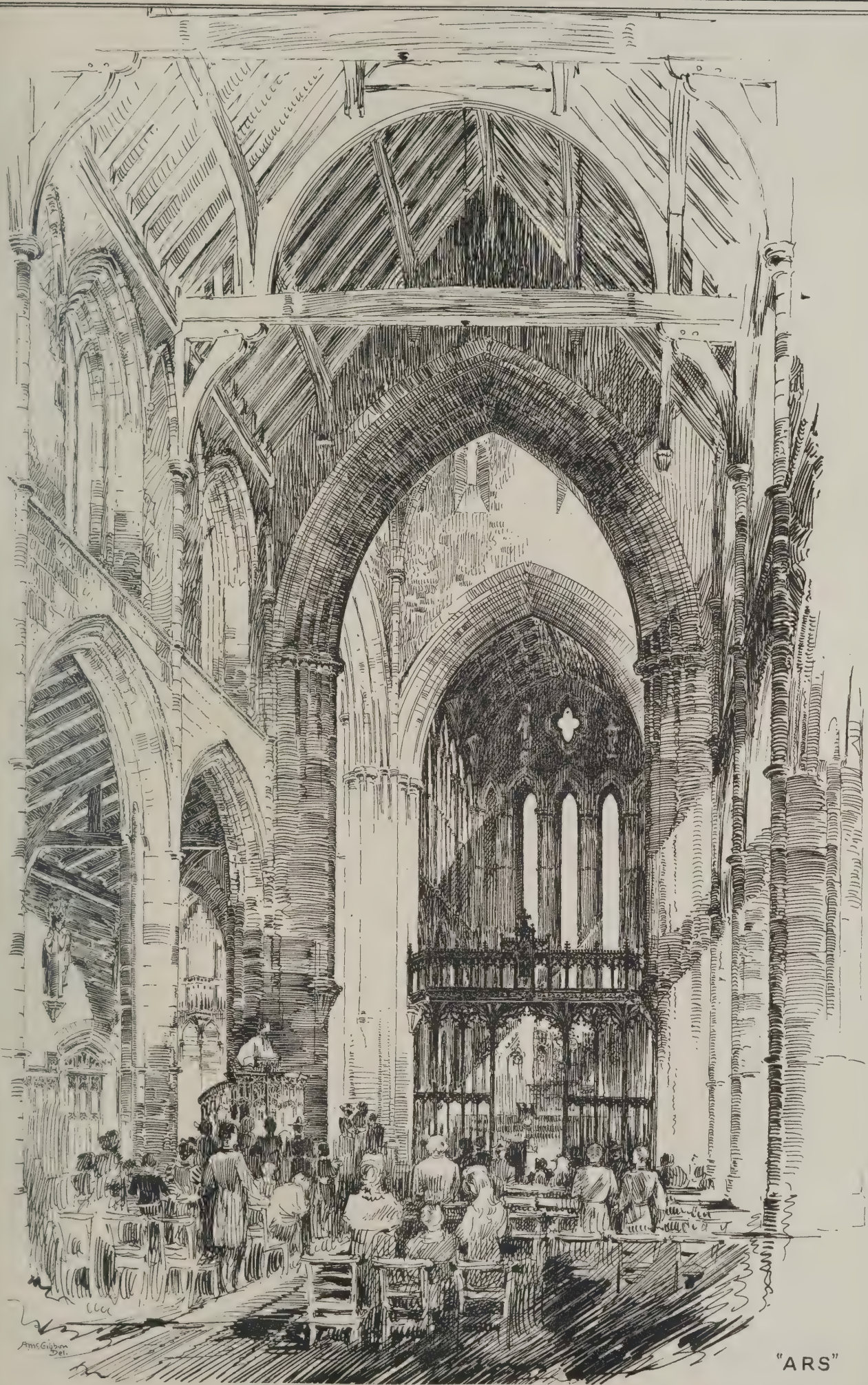


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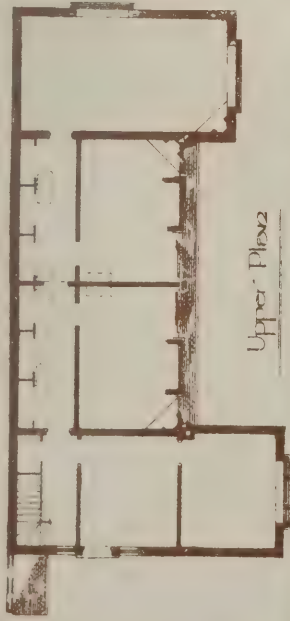


"ARS"

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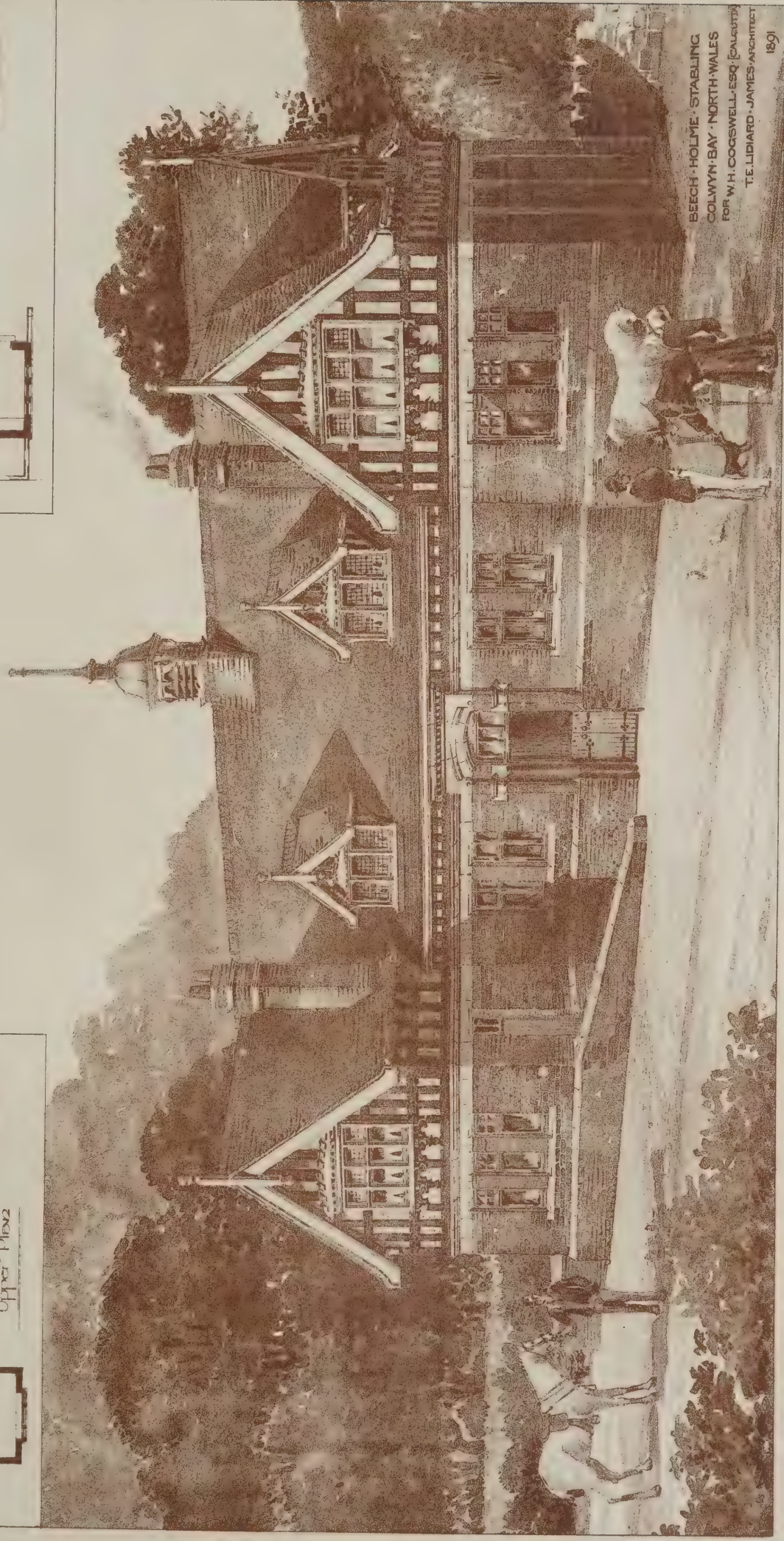
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Upper Floor



Ground Floor



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FOR W. H. COGSWELL-ESQ. (EQUARTY)
T. E. LIDIARD · JAMES ARCHT
1891

"PHOTO-TINT" by James Norman & Co. Queen Square London, W.C.

BEECH-HOLME · STABLES · COLWYN-BAY · N. WALES · T. E. LIDIARD · JAMES ARCHT



DRAWING-ROOM· CHIMNEY-PIECE· EAST-QUANTOXHEAD·

FROM PHOTOS

s. OCT. 28, 1892.



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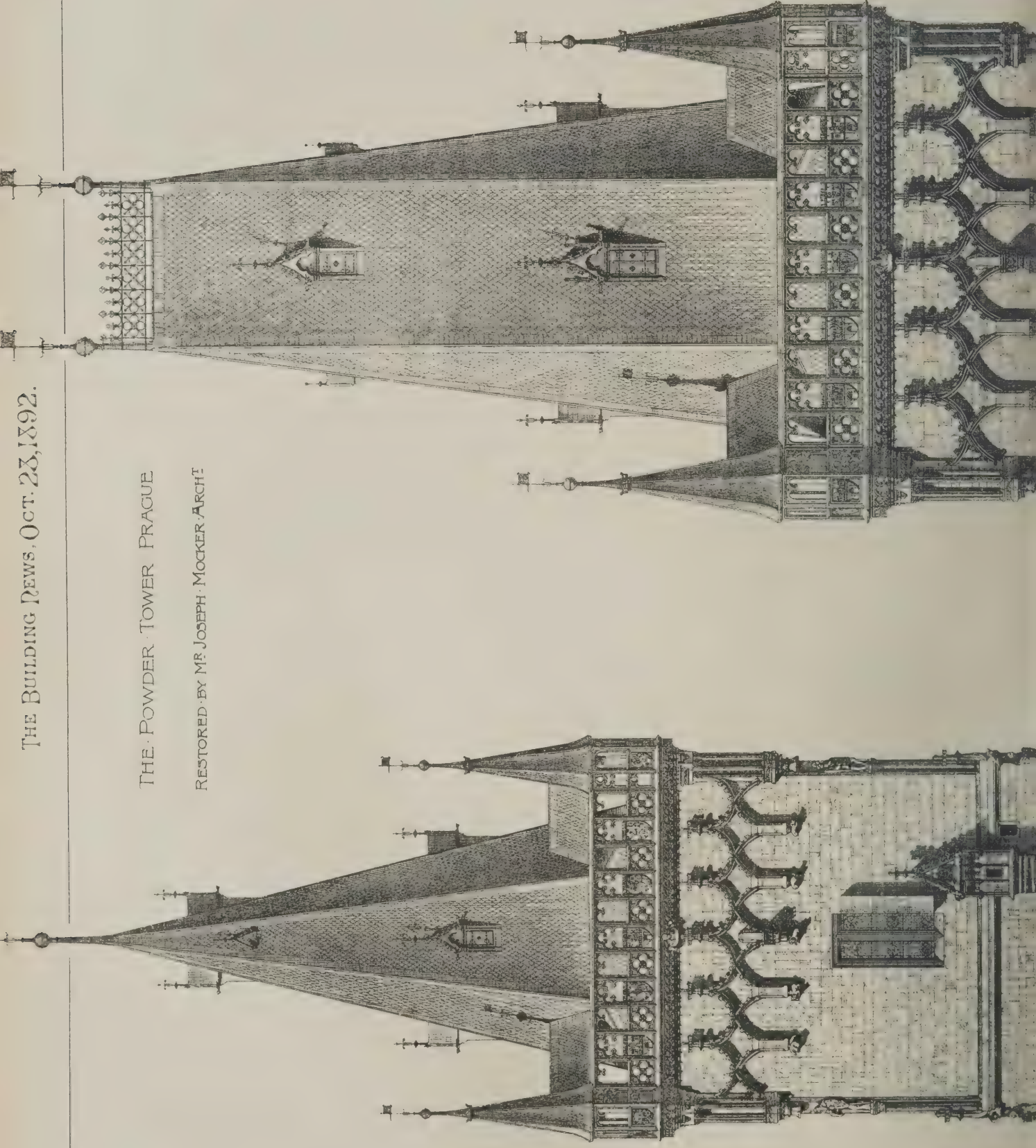
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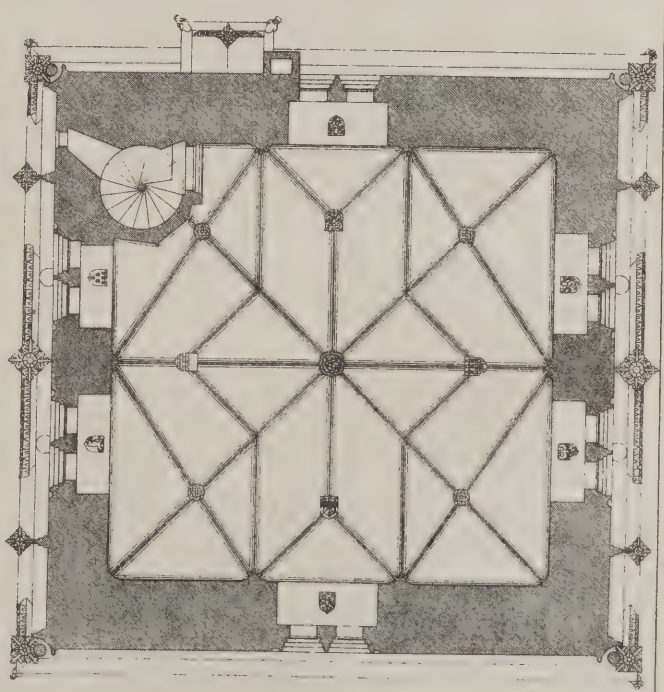
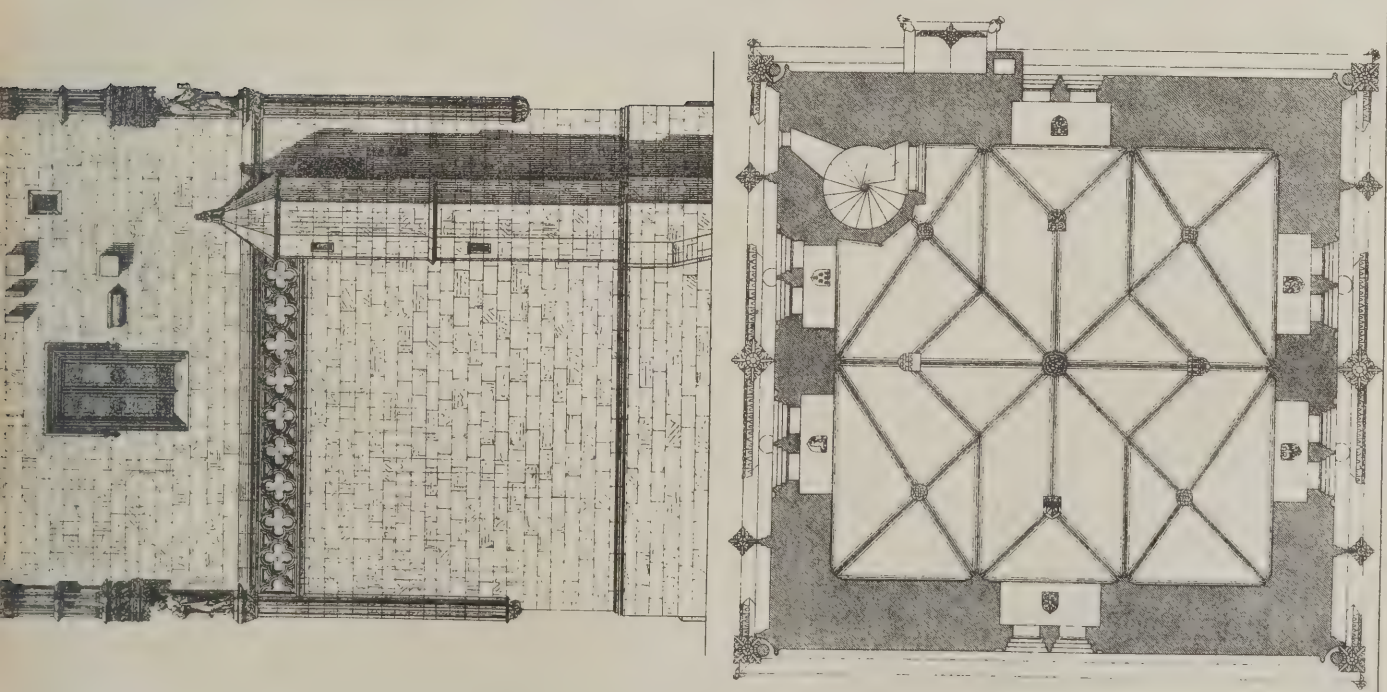
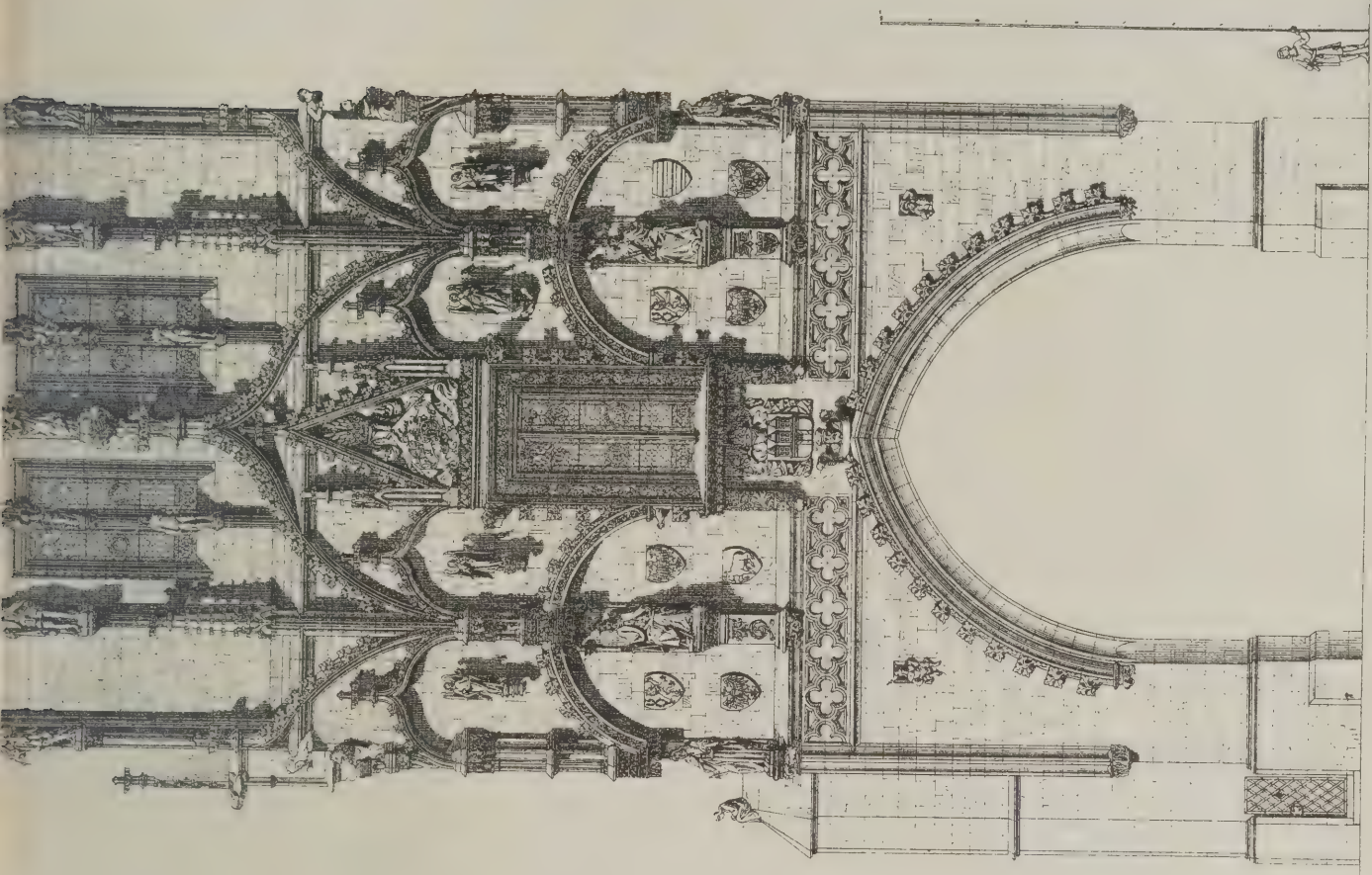
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THE BUILDING NEWS, OCT. 23, 1892.

THE POWDER TOWER PRAGUE

RESTORED BY MR. JOSEPH MÖCKER ARCHT.





THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1974.

FRIDAY, NOVEMBER 4, 1892.

THE LONDON COUNTY COUNCIL AS BUILDERS.

ON the 18th of last month, as we reported in our issue of the 21st ult., the London County Council resolved to become their own builders for the erection of artisans' dwellings for housing the persons displaced by the formation of the approaches to the Blackwall Tunnel. What, the question naturally arises, has driven the Council to determine upon this course? Is it a question of economy?—or is it that the Council have found difficulties in obtaining tenders from contractors, since they have imposed certain clauses in their contracts referring to rates of wages, hours of work, and trades unions? We are inclined to think there is more in this than at first meets the eye. The contractors do not like the terms of contract; so the Council say, "then leave them alone, and we will be our own contractors."

The step which the governing municipal body of London has taken is one of the gravest importance, and whether or not the difficulty of obtaining tenders has been the immediate cause of bringing this question to a climax, certain it is that the "labour" party of the Council have cried out for the "municipal workshop" ever since the formation of the Council. We cannot pretend to determine whether the Council, by entering into building operations, is going beyond its duties as an administrative body, as pointed out by one of its members, but one thing is certain, that the internal administration of the Council will have to be very considerably altered to meet the demands of the working of a "building department" which must arise if the work of the Council is to be carried out with that efficiency and perfection which some of its members contend can alone be acquired by abolishing the contractor.

The only department of the Council that can at all cope with this additional work (which is to be thrust upon the shoulders of the officials, without much consideration of its magnitude) is the architect's department. Now, are the Council about to request their architect to become their master builder? or are the Council going to create a new department for the carrying on of this work? Whatever is done in the present instance, if the Council become permanently their own builders, then they must have a building department apart from the architect's department.

When we consider that the works under the control of this body already include such vast undertakings as the bridges, tunnels, sewers, ferry boats, artisans' dwellings, street improvements, lunatic asylums, &c., it will be seen that the Council will become the employers of large armies of labourers and artisans for the execution of the work which has heretofore been performed by contract. The actual building work is small compared with the engineering works that must be executed by them, and the same questions arise in connection with this department as with the architect's. The policy of this municipal body in passing its resolution to build itself has been severely challenged in the daily press. One writer to the *Standard* complains that the Council will not be able to find any officer competent to take the place of the contractor, and take such means and make use of such checks as will prevent the attempts at speculation and robbery that"—states this writer—"are ways made in connection with the expendi-

ture of large sums of money on works." "However honest," he goes on, "or conscientious agents may be, they are not so keenly alive to the interests of their employers as a contractor is to his own interest, and, besides, a contractor is always much more on the look-out for delinquencies of the character above described than any agent can be. Then, all agents are not honest, steady, and reliable, and a contractor has to keep a close watch upon these men to see that they do their duty. What individual can the County Council find who can possibly pay the same attention to all these matters that a contractor does whose personal fortune is at stake? I venture to say that this *rara avis in terris* cannot be found, because he does not, in fact, exist. Everyone who has had actual experience in the carrying out of works knows that when a workman is in the employ of a company or a public body for day's wages he will not do nearly as much work as he will do for an individual."

This unwarranted and wholesale condemnation of the officers of public bodies did not go unanswered, for one signing himself "An Officer of the Council" entirely refuted these statements, and pointed out that "such *rara aves* not only exist, but are plentiful, and the Council have such at present on their staff, and one at least I know who has already been honoured by their confidence to carry out the erection of a small building in the vicinity of London, and although his 'personal fortune' is not at stake, he is sufficiently honest to look after the work as if it were."

We cannot say how far the Council are right in taking this step. We are, however, fully cognisant of the vast magnitude of the question, and fear the individual members of the Council have not all grasped the details of the proposed reformation in the execution of their public works. There is great truth in what Sir John Lubbock said in warning to the Council that "a municipality or a government might control everything, but it could not undertake to do everything." Is the Council undertaking too much? Is its present strength sufficient for the extra pressure on the actual working "members" of the body—i.e., the officers?

The scheme cannot work without the creation of a building department. It is not necessary to tell our readers the vast amount of routine and work that has to be gone through in the contractor's office and workshops and builder's yard; but it is necessary to remind the Council that, to carry out their own building operations, they will have to do as much work in their offices as the contractors have to do in theirs. Others than bricklayers, carpenters, and masons will have to be paid, and the Council were reminded by one of their own members that if they wanted their work well done they must have skilled superintendents, and not attempt to "sweat" their brain-work.

We await the result of the experiment of the Blackwall Artisans' Dwellings with interest, and wonder whether the ratepayers will be informed of the prices given in the tenders that were rejected, and the actual sum spent in the erection and superintendence of the buildings. We are inclined to think that it will prove that Sir John Lubbock was right in saying that "government and municipal work was always more expensive than private work."

There is another and perhaps more important side of this question, than that of administration—namely, that of the employment of labour, and the creation of public works for the occupation of the unemployed. This is a social question of such depth, involving many serious arguments, that beyond reminding our readers that the resolution of the council we are now dealing with tends towards the employment of municipal labour in London, we do not propose to deal further with it here.

THE SOUTHWARK BATHS AND WASHHOUSES COMPETITION.

THE Southwark Commissioners of Baths and Washhouses have selected three out of the 15 sets of designs submitted for the proposed new baths to be erected at the corner of Lavington-street and Ewer-street. The plans of Mr. F. J. Smith receive the first premium. The author exhibits a practical knowledge of the requirements. A commodious and well-planned entrance in the centre of the Lavington-street frontage is shown for the men and women, with separate lobbies and waiting-rooms. The pay-box is central between the two entrances. On the left side are the second-class women's private baths, ten in number, and on the right hand, or Ewer-street corner, the first-class men's private baths for twelve, arranged in three rows. These private baths form lateral wings to the entrance block, and a straight wall in the rear cuts the whole of this front block off from the two swimming-baths, which run parallel to Ewer-street. The first-class for men, 100ft. by 30ft., is the largest, and occupies the left-hand side of the site, with rows of 57 dressing-boxes 4ft. by 3ft. 3in. each, and with a 4ft. platform in front. The entrance is from the vestibule, and an official corridor for access to the laundries, &c., runs from end to end, dividing this swimming-bath from the adjoining second-class one, which is 75ft. long and 30ft. wide and has 49 boxes, and abuts on Ewer-street. This general arrangement of two parallel swimming-baths is necessitated by the oblong shape of the ground, the longest side of which faces Ewer-street. The entrances to baths, main stairs to gallery, and other conveniences are well planned for classification. The drying-houses, washhouse, and laundry are at the end of the second-class swimming-bath. The author has designed his main baths as separately roofed buildings. An open timber roof, with skylight, is shown over the men's bath, and a timber and iron-trussed roof over the second-class swimming-bath, the official corridor between them being roofed low and top-lighted. The basement plan shows the spaces between the swimming-baths and under the boxes utilised as tunnels for the piping. The first floor has a gallery round three sides of the first-class swimming-bath, and in the front block over the private baths are the five first-class women's baths, and in the right-hand wing are 24 second-class men's, top-lighted, each division with its own stair, with the artists, superintendent's, and commissioners' rooms in the centre. A gymnasium is provided for in connection with the second-class swimming-bath, while the second floor, confined to the centre block of main front, is devoted to the superintendent's residence. The elevation towards Lavington-street is arranged with a centre three-story block, having a high roof and side wings. There is a wide centre elliptical archway, and the general features and details are Italian.

The second premiated design is by Messrs. Geo. Elkington and Son. In this, the main swimming-baths are similarly disposed, with a central corridor between, not carried higher than the ground story. The first-class bath is 107ft. by 46ft., having 59 dressing-boxes, with a water surface of 100ft. by 30ft. The second class, on the Ewer-street side, is 82ft. by 45ft., with 48 boxes, and a water area of 75ft. by 30ft. The front block has two rather narrow centre entrances leading to the respective waiting-rooms for each sex, though there are two other end entrances provided, one for the women, and the other for the commissioners at the Ewer-street corner. The women's second-class private baths on the left side provide for ten, and are conveniently arranged and lighted. On the other side of entrance is the commissioners' room and office. Washhouses 29ft. by 42ft., with 24 compartments, are behind the second-class swimming-bath. A

gallery is shown round the first-class bath, and 12 men's first-class and 24 men's second-class private baths are arranged in the front block of first floor. The second floor has only the superintendent's private rooms. A timber-framed roof is shown over the first-class swimming-bath, and a timber roof, with iron ties, over the second; both have raised skylights. The authors have provided for meetings and entertainments by arranging the gymnasium in the second-class swimming-bath, and covering over the area of the first-class bath as a public hall. The elevations are in red brick with stone dressings, a rather too ornamental Renaissance style being adopted with corner towers over entrance, and with open parapets and other details. The flank elevation to Ewer-street is not agreeably balanced, as it shows a long flank to the bath with two-storied end buildings.

The third design, by Messrs. Spalding and Cross, has certainly the best elevation of the three, designed in a free 18th-century style of Classic, with rusticated stone basement supporting a red brick and stone superstructure. Ionic pilasters adorn the centre portion of the façade, which is surrounded by a turret of pleasing outline rising from a tile roof, and the side wings are accentuated at the extreme ends by pediments. The plan has a well-arranged and spacious centre entrance, with lobbies for men and women, and a ticket-office between them. A spacious hall, with first and second-class waiting-rooms, giving access to their respective swimming-baths, and to the women's and men's private baths on the left and right, forms a good feature; but we do not like the arrangement of the two classes on the women's side, a separate front entrance to which is provided; nor do we think the continuation of the men's second-class private baths round Ewer-street along the outside of second-class swimming-bath is desirable. The first-class men's private baths are in front on the right hand of main entrance. The two swimming-baths are placed side by side; the first-class is 100ft. by 30ft., and the second-class bath 75ft. by 30ft., these being the dimensions of the water surfaces. The authors' cross-section represents an arched ribbed timber roof, with raised lantern over the former, and a semicircular open ornamental iron truss over the latter. There is a gallery to the first-class bath, and the total height from water surface to roof is 35ft.

By the introduction of iron columns supporting the circular iron trusses of the second-class bath, the author obtains a girls' gymnasium, 85ft. by 6ft., over the side dressing-boxes, and a boys' gymnasium, 74ft. by 15ft., is provided on the other side by the erection of a second story over the men's private baths facing Ewer-street. There are subways under the dressing-boxes for pipes.

Viewing the relative merits of the designs, the third premiated set has many qualifications which entitle it to rank high, and it takes the lead as an architectural design. The strength of the first premiated design is in its plan; the author raises his ground-floor level above that of the street, and thereby gets a fall for emptying the bath; provision is made for meetings and entertainments by movable floors over the bath, and the author has also seen the need in view of such accommodation of a large vestibule space, and for means of obtaining an additional exit. The engineering details are well considered also; all exhaust steam is utilised. The cost is estimated at £19,850, exclusive of gymnasium.

ROYAL SOCIETY OF BRITISH ARTISTS.

THIS exhibition, if not equal to some of the former displays, maintains a fair average. The fine landscape of Adam E.

Proctor, a young member (4), is tenderly painted—a riverside scene, the water filling the foreground of the canvas, with floating lilies and a margin of rushes; beyond them is a group of willows, between the branches of which is a sunlit meadow; the light and shadow and reflection, and the freshness of the foliage, are painted with much beauty. R. W. A. Rouse also gives several of his vigorous landscape effects; the stormy sky and the effect of sunshine on the hilly range (15) give a good idea of the atmospheric conditions conveyed. Another, "The Coming Storm" (130), and a few in the other galleries, will be noticed for their characteristic freshness and strength of handling. Edgar Bundy, a young and rising painter, sends one of the best pictures. "To We Three" (30) is an interior of a room in an old hostelry, with furniture and fittings of the 17th century, where two gallants in the costume of the period are sitting drinking to the health of a comely lass who stands on the opposite side of the table. The girl's figure, in a darkened room, is thrown into strong relief by the light coming through an open mullioned window, through which a sunlit garden is seen. The movement of figures, drawing, grouping, and colour are admirable, and the accessories carefully drawn. Some small but clever figure-subjects are hung round the fireplace, Haynes King's figure of a housemaid in an armchair (51) and H. G. Glindoni's card group (52) being amongst the best. Arnold Priestman (59) has a broadly-painted landscape, very clever in its stormy atmosphere, "Wind-blown." Frank Brangwyn's "Pilots, Puerta de Passages" (68) is a dexterous study of dark figures on a verandah against a strong, sunlit background of houses; and A. Glendenning's "Adversity" (65) is remarkable for its pathetic rendering of a man and wife on the outskirts of a town. The grey, showery atmosphere, and the light and reflection on the wet ground, is painted with much fidelity. G. C. Haite has a clever sketch of a Dutch Market (64); J. L. Pickering a pleasing autumn landscape. John R. Reid is represented by a forcibly and poetically painted coast study, "The Storm"; while for large canvases, "Suspense" by W. H. Pike (138), and "In Sight at Last," by W. Peter Watson, call for attention. The first represents a cottage interior, where a labourer, with two little girls, sit round a fire, a flickering candle by the window, through which the cold grey light of early dawn appears, telling of a long night of watchfulness and anxiety, probably the dangerous illness of a wife and mother. The last-named picture is also a pathetic incident: a seated old woman, an invalid mother propped up by pillows with her daughter, scanning the sea before her humble cottage for a loved husband or son, whose vessel is in sight. The President's (Mr. Wyke Bayliss) "Votive Chapel" interior, "For those at Sea" (131), is full of poetry, light, and colour; and another picture, "A Golden Spring" (172), by W. Gilbert Foster, is of merit. In the South-East and South-West Galleries we notice two or three talented interiors by John A. Lomax, "Down on His Luck" (367), "Forbidden Lore," a girl perched on a library step-ladder reading (207), and "Dry Reading" (232); a large view of "Durham," by Albert Stevens, enveloped in smoke and mist; a capital ideal head study, "Clematis" (208), by G. Sheridan Knowles; figure-subjects by L. C. Henley in his accustomed sentimental style. John R. Reid's "Fisherman's Bairs" is certainly one of his best works; H. Harwood's "Cornfield" (233) is excellent in tone and handling.

The water-colours are strong. Albert Kinsley (381) "Autumn's Sweet Decay" is delicate and sweet in tone, and his other works in the same key of landscape are worthy of his pencil. Leopold Rivers (385),

R. B. Nisbet (389), T. B. Hardy (390), and G. C. Haite contributes some characteristic landscape studies. Ernest George's pair of drawings, "San Lorenzo, Genoa" (412) and "Albenga" (419), are clever and bright sketches of towers in strong sunlight. W. Harding Smith sends a careful drawing of "Crypt, Church of S. Leno Maggiore, Verona" (473); but the great attraction in the North-East Gallery is the inimitable screen of sketches of Continental cathedrals by the President, Wyke Bayliss. These are delightful studies in water-colours—first notes of light and shade, which is ever changing, and from which the methods of work of this consummate painter of ecclesiastical interiors in their sublimest moments of gleaming light and gloom may be seen. Some of these sketches, as those of "The Certosa di Pavia" and "San Miniato, Florence," are slight pencillings with thin washes of colour. Seventeen sketches, including two beautifully finished drawings of Evreux and Antwerp Cathedrals are, hung. In the North-West Gallery the "Interior of Coutances" (392), taken from the ambulatory round the apse, is a marvellous example of perspective, colour, light, and shadow, and the power of the painter in producing a perfect melody.

INSTITUTE OF PAINTERS IN OIL-COLOURS.

IN the three galleries in Piccadilly, containing over 600 pictures, the most uncritical amateur and buyer may find plenty to admire. A necessarily large number of works of a mediocre quality are to be seen among so large a collection, and we can do no more than glance at each gallery. The West Gallery contains about a dozen works of merit. Perhaps J. C. Dollman's "Dead or Alive" will find more admirers than Edgar Bundy's work further on, or even than Sir James D. Linton's "Approaching Michaelmas" (143), but each is excellent in its way. Mr. Dollman again gives us a bit of his rare pleasantry in the stalwart highwayman who, pistol in hand, his dying horse lying at his feet by the roadside, possibly over-worked, is prepared for his pursuers, who are seen in the distance. With one pistol in readiness to fire, and another in his breast-pocket, there is little chance of escape for one or more of the half-timid officers. The landscape and distance, with the winding road through a bleak common, are capably drawn in the perspective; the horse with the saddle, back to the spectator, is masterly. "His Worship's Dinner," by Edgar Bundy, is also full of life and powerful drawing and colour. On the large wooden table the cook is holding up the neck of a large swan, one of the items which is being read out by the steward. On one side is a deer, and there are fish, and poultry, and fruit—quite Snyder-like in the prolific luxuriousness of the wealthy man's table; but the work is less pleasing than Mr. Bundy's admirable picture in another gallery, "To We Three." The President's work, "Approaching Michaelmas" (143), is a charming cottage study, with sunlight glinting over its front, its thatched roof backed by dark trees, and the foreground clothed with foliage and flowers. On the top of the rustic steps sits a girl, watching some geese in the fore part of the picture. The whole is full of tenderness and pathetic interest. C. Burton Barber's "Under a Spell" is also a clever study of a young girl seated by a table fondly stroking with her quill pen a little dog on a chair, and soothing it to sleep. Other pictures of this class which call for notice are the Hon. Duff Tolle-mache's "Le Curieux" (12), an old collector, in his shirt sleeves, examining a watch; Hugh Carter's "Rest by the Way," a girl resting her basket on a steep cliff by the sea; Arthur Meade's "Attentive Audience," J.

Watson Nicol's "Love's Labour Lost," a boy playing a whistle-pipe to a caged magpie; Davidson Knowles' contemplative but rather motiveless picture of young lady on a stile in a woodland, "The First Time of Asking" (44). Landscapes and seascapes which are strong may be instanced in the following pictures:—F. W. Baker's "Toilers of the Sea" (2), a well-painted seascape, with boats within a rock-built harbour; Robert W. Allan's fresh study of the sea, "The Breezy Blue" (13). Claude Hayes gives us some very natural colour and sentiment in his "Surrey Common," with the caravan and gipsy life. Edmund G. Waller's fine landscape representing the effects of "Sunshine and Shade" (60) is a peep of a sunny distance through dark, overhanging trees. Richard Wane paints a group of red-tiled cottages under a cliff skirting a bay with its blue sea in "Burnmouth, Berwick-on-Tweed"—quite strong in colour. E. M. Wimperis, in "A Sussex Lane," gives us one of his broad, hazy landscapes, lit up by gleams of the sun, admirable in its strength of colour and bold handling of trees and foreground. "The Fallow Plough," by H. Hughes Stanton, looks rather hard and lacking in atmosphere, though clever as a study of natural colour. W. W. Caffyn in his Surrey landscape (112) and Terriock Williams' view of Honfleur have nice colour in a low key, and near them Carlton A. Smith in "Winter Fuel" has a clever figure subject. One of the largest and strongest landscapes is T. Sidney Steel's sombre hillside "Death of the Master Stag" (144), and in a very opposite French style is the sunny pastures of Philip E. Stretton (169), admirable in the drawing of the cattle.

Arthur Hacker's portrait of "Chas. F. M. Cleverly" (19), J. Herbert Snell's (54) feeling landscape, Jos. Clark's "Golden Wedding" (80), Louis Grier's charming impressionism, "The Quiet Waters of an English River" (95), J. J. Shannon's admirably painted portrait of a boy (97) are other pictures of merit. In the Central Gallery, the President's centre picture, "The Old Story," a gossip between young man and maid at an old cottage gate, is painted with much tenderness. Alfred East's "Norfolk Marshes" (248) is a delightful piece of broad handling and colour, and Ernest A. Waterlow's "Romney Marsh" (24) is truthful in its tone and colour. A good example of Edgar Bundy's power as a painter of incident is "The Sponging House," worthy of Teniers' brush. The man with pale and lejected countenance, with his arm round his wife, whose head rests on the table, and he gambling group in the rear of the apartment, are cleverly painted, and full of pathos. Charles E. Marshall's large picture, "Men were Deceivers Ever," is too artificial in subject and colour. James Orrock has two characteristic coast scenes, both from Holy Island, full of atmosphere, and of silvery-grey tone (257, 267). We come next to John R. Reid's "Toby's Rehearsal," an itinerant player and his little girl, in ancient costume, seated under an old tree, putting their dog through his part, strong in colour. Further on, Fred Roe's "Under Repairs" (276); a fine seascape, with fishing-boats, by Edwin Hayes, R.H.A.; Frank Colesey's "Trawlers," a large and clever sea-piece. The work of Frank Walton, "Barked Oaks Newly Thrown" (460), opposite the President's work, is a beautiful rendering of a woodland, in which the painter, a master of foliage, blends in charming and harmonious colouring the browns and greens, and gives us that sense of depth and mystery one discovers in a wood. The marvellous ramifications of the branches are dexterously depicted. T. B. Kennington paints a different phase of life than we have been accustomed to see from him. "Engaged" is a group of three delightfully insouciant young ladies in low evening dress,

one of them being questioned by her companions and displaying a natural shyness. The delicacy of the colour of the dresses and the whole handling shows that the painter has almost equal power of displaying character among the fashionable as among the poor and friendless. "La Coquette," by J. Henry Henshall (372), is also a clever study of eyes. A. D. Peppercorn's dark landscape of trees against a grey sky (377), Elias Bancroft's "The Nomad" (359) are pictures of interest. One of the most attractive pictures is E. Blair Leighton's "Where There's a Will, There's Always a Way," a fair and picturesquely-dressed young lady in 18th-century costume, unlocking a garden gate, while her lover stands waiting in a boat on the river. The tale is admirably told; the hilly distance and the harmony of colour perfect.

Mrs. Frank May's exquisite drawing "A Bit of Colour" (183), Geo. Morton's "He Cometh," and especially C. MacIver Grier's "Taking a Mean Advantage"—a well-told and amusing picture of an old gentleman asleep at the table in an inn parlour while his dog is helping himself to the fish on a plate, and a waitress smilingly watches near the door—are pictures of mark. F. Markham Skipworth (224), T. Noyes Lewis (243), Miss Edith M. Cameron, "Santa Cecilia" (286), are other contributors of note.

The East Gallery has only a few works of interest, and nothing very important in subjects. John Finnie, in his delicate study of lake reflection "Rydal" (420); J. Aumonier, in his sunlight on hill and meadow in a Sussex hayfield (422); Arnold Helcke, in a grey-toned coast view near Boulogne-sur-Mer (429); Alex Harrison, in "Moonlight" (430), have done good work. We cannot admire the rather grotesque imaginative frenzy Henry J. Stock has given us in his "Dream of the Worlds"—the sun and the planetary spheres before the gaze of a human soul represented standing on the brink of a precipice. John R. Reid's "A Gipsy Queen" represents a gipsy with her retinue passing through a village lane, strong in colour. "Zelica Supplanted" (472) is an Oriental figure-subject, cleverly conceived, and in delicate colour, by F. Markham Skipworth, and near it Edwin Hayes has one of his fine sunsets on a Dutch coast, excellent in colour. Below is a delicately-painted wave study by Harry E. J. Browne (475), and, further on, J. L. Pickering's "Dream of Home," an old house by lake, amidst ancestral trees, has some nice colour and sentiment. Edward Hargitt's "Rent Gathering" (498) is a fine study of a stormy sky in the Highlands. For atmosphere effects, few surpass Alfred East's "Clairwin Valley" (513), a large sunny landscape, veiled in thin mist. Stuart Lloyd has one of his riverside hamlets, "Sitlington, Sussex" (514). Edwin Harris's "Firstlings of the Year," a girl making a primrose bunch, is natural. A study by Anderson Hague, "In the Glen," is a delicious piece of rock and foliage through which a rivulet sparkles. E. M. Wimperis's "An Autumn Day" (537)—a stream meandering through a meadow—is one of his strongest landscapes. Probably the chief interest centres in A. Chevallier Taylor's "Confirmation Day"—a young girl in her veil preparing for the ceremony; she sits with her rosary in her hands, and near her small bedroom altar. In the same class is T. B. Kennington's cleverly-drawn and painted figure of a young lady clad in pale green looking through the "Marriage Column" (540). The brown background enhances the colour; but the chief merit of the work is the strong top-light, which catches and brightens her face and the folds of the silk dress. Fred G. Cotman's "Burst of a Storm" (549), and the soft, golden hues of foliage and scattered leaves in Ernest Par-ton's "Autumn Morning" (558), are worthy

of notice; to which we may add Yeend King's "Autumn's Robe" (597), a fine sylvan landscape of gold and red hues, and the Hon. J. Collier's clever-painted "In a Beech Wood," with the beech-trunk lying athwart the bed of brown leaves (625). Frank Calderon's "Parting" (607) is pathetic and well painted. Sir George Hare's "Ha! Ha! Ha!" (600) is a cleverly-painted negress' face, and there is also a brilliant and strongly-coloured picture of a slave-trader by F. Brangwyn.

STABILITY OF WALLS ON SOILS.—VIII.

PROBLEM OF PARALLEL FORCES ACTING ON WALL FOUNDATIONS.

THE different vertical loads and pressures acting through the walls of buildings upon the foundation-soil base are to be considered as so many parallel forces—i.e., forces acting in parallel directions, either in one or different planes, represented as concentrated at the axes of gravitation of their masses or of their supporting points. Their resultant must be ascertained by the rules for the resolution of parallel forces acting in the same plane. The corbelled or cantilever projecting features of a building, such as oriels, angle-turrets, balconies, &c., whose axis of gravitation of the overhanging portions pass outside the face of the supporting wall, must have their weights traced vertically through the plane of their static fulcrum or imposts. The moment of the projection or the leverage of action of such overhanging features which pass outside the face of the supporting wall does not increase the static reaction of the load upon the soil beyond its mere dead weight, as the leverage preponderance is counterbalanced by the mass of the wall, &c., to which it is structurally attached.

Analysis of Sectional Wall Loads.—In estimating the weights and dispositions of loads derived from the aggregation of materials of different densities, as they are usually arranged in various thicknesses when they make up the sectional width of the wall, it is necessary to separate these component loads, such as those of ashlar or stone facing, from the backing of common brickwork, which is less dense, so as to arrive at their resultant. The separate loads derived from stone or brick projecting cornices and blocking courses, also those of the various story stages of walls between wall benches, including those from the various floors, bressummers, and girders, and from roofs and any appendages thereon, and likewise those from any other contributory source of loading which are imposed upon the foundations, must be relatively located on the wall base, O O', Fig. 17, by the position of vertical arrows on the axes of gravitation, passing down through their centres of gravity, and intersecting the base line perpendicularly, all of which are indicated in Fig. 17.

Overhanging Features.—Then with regard to the position of the point or plane of reaction of overhanging features, or structural corbelling, an approximation may be roughly obtained by considering the overhanging mass, such as a stone cornice, to have its centre of gravity at one end of a lever, and that of the blocking course, counterbalancing it, at the other end, while the static fulcrum will be at some intermediate point in the cross section of the supporting wall. The position of this balancing fulcrum will be at a point inversely proportioning their leverages to the ratio existing between the respective masses. If the moment of the counterbalance were only equal to that of the overhanging weight, the slightest applied excess of weight or pressure would overturn it round the edge of the supporting wall. The counterbalance must, therefore, have sufficient excess of weight or of anchorage when the counterbalancing mass is partly below the level of the corbelling, in order to insure the necessary stability. The position of the point or plane of the static fulcrum must, therefore, lie inside of the face of the supporting wall, in order to impart stability, such as at the point (A) immediately below the bedding point of the cornice.

Corbelled Chimneys.—In the Metropolitan Building By-laws, 1855, s. 20 (1), chimneys are permitted to be built on corbels above the level of the ground-story ceiling, if the projection from the wall does not exceed the thickness of the wall in addition to it. The chimney being hollow, if symmetrical, would thus change the

axis of gravitation from the centre of the solid wall to a point near to its face, so that, apparently, it would have little stability. If, however, the chimney is corbelled in a wall which is not itself "corbelled out" on either side of it, it will derive more or less stability therefrom, depending on its character and lateral tenacity. If the wall remains solid throughout to which the chimney is corbelled, the stability is not endangered.

Relative Position of Component Loads.—The relative position of sectional resultants of the component loads of the various masses of the wall materials, and of the supporting points of floor and roof loads, is shown on a base of a diagram of the base, OO' , of the lower or basement wall, Fig. 17. The object is to find the centre of gravity of the sum of all the foundation loads. First, find the resultant of the loads imposed above the base of the wall, OO' . Second, find the loads added by the footings, concrete bed, &c., and their resultant, which is then placed symmetrically underneath the centre of gravity of the loads above them, as in Fig. 21. Then upon an enlarged copy of the diagram wall base, OO' , Fig. 17, drawn to a convenient scale, as Fig. 19, set down the relative values of the loads proportionately reduced to their smallest representative numbers, to simplify the computations, instead of being encumbered with large numbers in the operation. The final results can easily be restored to their proper values for further use. All weights or loads should be reduced to the same denomination, as tons, hundredweights, or pounds, as will be most convenient for scaling them on the diagrams. A scale with decimal subdivisions is convenient.

Resolution of Parallel Forces.—The problem of the resolution of parallel forces in its simplest form is solvable by the method of leverage—i.e., successively finding the relative positions and amounts of the resultants of adjacent pairs of forces, and in like manner combining their resultants for new resultants, and so on, until a final resultant is obtained. This resultant is equal to the sum of all the forces acting at its centre of gravity. The horizontal distance between the points of application of the forces is divided in the proportion of the forces to each other, and the resultant placed in an inverse order, so that the larger force has the less leverage from the resultant point.

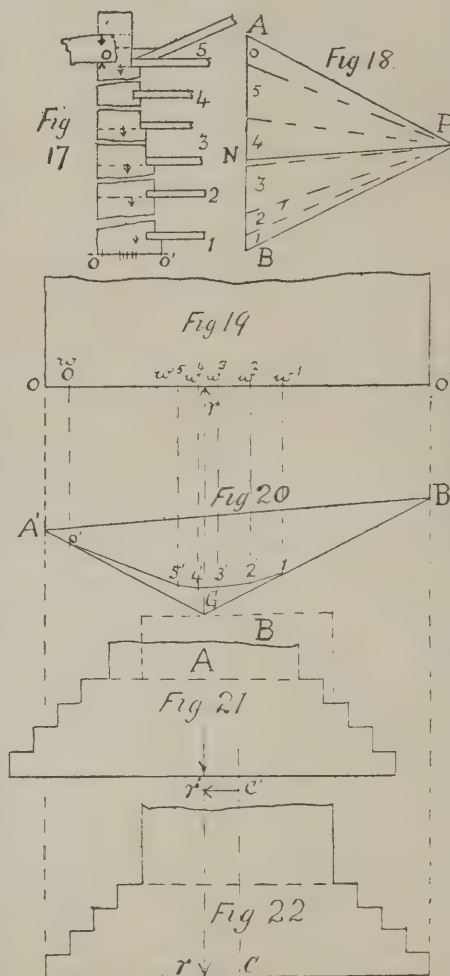
Funicular Polygon of Forces.—But the graphic method of resolution by the funicular polygon of forces serves the same purpose in a ready manner. It may be noted in passing that the funicular polygon takes its name from the principle of action of a cord or rope suspended by its two ends, and loaded at various points with a number of weights, which may be either equal or unequal. If by the leverage principle just explained the weight, and the position of the centres of gravity of each subdivision of the analytical loads—as, for instance, those of each story-stage of the wall, and of the floors, &c., which rest upon each bench—has been found, as in Fig. 17, and that their representative ratios, as next explained, have been laid down to scale in a vertical line, as shown in Fig. 18; then suppose the loads per square inch to be all reduced to cwt.s., and if the numbers were yet too large, take, say, one-tenth part of each so as to get manageable figures, and proceed with the processes of resolution. To afford an easy illustration, take round numbers to thus represent the loads, with a decimal point introduced. Then upon an indefinite vertical line, as $A'B$, Fig. 18, measure off downwards by a convenient scale these representative loads as they follow each other in succession from right to left, or *vice versa*, on the wall-base, Fig. 19, and thus transfer them to the vertical load line $A'B$ in the same order.

Static Disposition of Structural Loads in different Cases.—The following four cases may be here noted as commonly met with in ordinary practice.

1. **Solid Walls with Floor Joists.**—Although the weights of floors having joist-ends inserted in the wall of ordinary construction, without pugging and soundboarding, in successive stories, when all are plaster-ceiled, may be the same for nominally like spans, their static effect on the cross section of the supporting foundation base will vary directly as the bearing centres of joists recede on the wall-benches. These differences of recessions of wall-benches necessarily affect their correct spans by so much. As regards the comparative weights of brick walls and such floors there can be no fixed ratio, as the weight of the

materials varies with their character, condition, and dimensions. Generally, however, the structural weight and the static equivalent of ordinary dwelling-floor loads would be about one-fourth of the weight of one and a half brick walls, solid throughout, not exceeding 10ft. of effective height to each floor. The resultant of these two sources of loading would in such a case be placed one-fourth of the distance between their respective centres of pressure nearer to the wall-centre of gravity. For each additional half-brick in thickness the ratio of floor weight to wall weight would be about one-twelfth less. Thus for two bricks thick the ratio = $\frac{1}{4} - 1 \cdot 12 = 1 \cdot 6$, with corresponding inverse leverages. This is only intended to afford a rough idea by inspection at a glance in viewing the relative positions of the common centres of gravity in the sectional diagram of walls and floors, Fig. 17.

2. **Solid Walls with Floor Girders.**—In the case of girders inserted in solid walls, and carrying considerable areas of floorage whereby a concen-



tration of weight is imposed at a few points, the ratio would be much reduced at its bearing-point on the wall, leaving its adjacent parts little affected thereby except through the horizontal tenacity of the wall.

3. **Fenestrated Wall Static Piers with Joists.**—The floor loads of inserted joist ends covering the bay portion of fenestrated walls are necessarily concentrated on the static pier portions of the wall. The adjustment of the foundation area must be made on this basis of independent piers supporting not only the intermediate bay-floor loads, but also those of the roof and of the spandrel or transom walls over the vertical tiers of window and door voids.

4. **Isolated Wall Piers Carrying Floor Girders.**—Care must be taken to compute the floor loads for those piers only with isolated foundations, which actually carry the girders. The adjustment of their foundation areas is to be made according thereto. When the fenestrated wall foundations are continuous, as they often erroneously are, instead of being isolated, all the bay-wall loads are structurally transferred to the static piers, which only should properly support all the loads. The reinforced support derived from the adjacent

bay foundations, when put in, depends upon the horizontal tenacity of the wall, the foundations become convex underneath the bay and concaved under the pier, while the masonry is yet in a green state.

What are Floor Loads on Foundations?—The mistake is sometimes made of allowing the recognised "strength" or computed stiffness safe-loads of the floor timber scantlings, such as $1\frac{1}{2}$ cwt. for dwellings for floor loads upon the foundations, but the actual static loads rarely, if ever, really amount to one-third of these computed "strength" loads. The actual dead structural loads, along with the usual imposed loads, together with average accidental loads, whether "dead" or "live," are only to be computed; otherwise a false resultant, both in amount and position, would be obtained, and the stability of the foundations be thereby impaired.

Description of Diagrams.—In accordance with the foregoing principles of estimating and locating the static value of the various loads, begin an enumeration of them with load No. 0, Fig. 19, representing that derived from the cornice and blocking course, assuming it all to be of uniform density. Next take load No. 5, derived from the roof, also taking account of the roof, gutter, and ceiling loads, and the remainder of the wall above the level of the templates. Then follow loads 4, 3, 2, and 1, including the weights of walls lying vertically between the benches of the story-stages, and of the several floors. There may be more than one included in each story stage, and of the loads supported by the floors. In a similar manner may be treated any number or manner of loads which may be derived from any other source that occurs in practice. As the whole of the load line $A'B$, Fig. 18, by scale, represents the total of all the vertical loads, less the footings, acting upon the foundation soil, it also represents the amount of their resultant acting through their united centre of gravity. In the example the vertical component of wind force is not allowed for. Only a few loads are treated to illustrate the details of the general process of procedure. It may be observed that when forces, as those due to weights, are all parallel to each other, the polygon representing these and their reactions becomes a straight line, having their common direction, but divided into segments proportionate to the several direct forces and their corresponding reactions, on the principle that the sides of the polygon are severally parallel to the directions of the forces which they represent. The upward reactions of the gravitating forces, as $A'N$, $N'B$, Fig. 18, complete the polygon. The common converging point, P , to which the lines in Fig. 18 radiate from the extremities of the several load-segments, $O5$, &c., to 1, is called the pole. The sides of the funicular polygon, Fig. 20, are drawn parallel to these converging lines, which respectively represent the amount of stress upon the cord between the points of application of the several weights. We may now briefly follow the process of constructing Fig. 18. Take as the pole any convenient point, P , on either side of the vertical load-line $A'B$, from which lines may radiate to both ends of all the load-segments $O5$, &c., to 1, without confusion. Draw these radial lines accordingly, PA , Po , $P5$, &c., to PB . Lay off on the horizontal line OO' , Fig. 19, representing the width of the wall base, the relative positions of the several loads, according to the method of analysis already explained. Through the extremities of this base-line, and likewise through the several load-points, wo , $w5$, &c., to w' , draw indefinite perpendicular dotted lines, OA' , woO , &c., to $O'B'$. In OA' , take any structurally convenient point, A' , Fig. 20, and through it draw the oblique line $A'O'$ parallel to the radial line AP , Fig. 18, and intersecting the vertical dotted line woO in the point O' , and then produce it indefinitely beyond; next through the intersecting point O' , Fig. 20, draw the line $O'5'$ parallel to OP , Fig. 18, and intersecting the $w55'$, in the point $5'$. In a similar manner proceed with the construction of the remaining sides of the funicular polygon, Fig. 20, parallel to the remaining radial lines of Fig. 18, each side terminating at the point of its intersections with the verticals, except the line $I'B'$, which is indefinitely produced to intersect the previous extension of $A'O'$ in the point G . A vertical line, Gr passing through this last intersection perpendicular to OO' , intersects the wall base in the point r , and gives the position of the point of application of the resultant of all its loads as above. A line drawn from P , Fig. 18, parallel to $A'B'$, Fig. 20, to intersect the load



MONTAUK CLUB-HOUSE, BROOKLYN, NEW YORK.

line, A B in the point N, divides it into its reactions at the extremities A and B, equal to A N and N B, measured by the scale of the load line. It is equal to the sum of the loads. The lines A' G, G' B', Fig. 20, represent funicular action by the position assumed by a cord suspended at the points A' B', with a weight attached at a corresponding point, G.

Example.—If the unit-pressure at the wall base be three tons per square foot of its horizontal section per lineal foot of wall, and that the soil has only a safe bearing power of one ton per square foot, then it is seen by the table p. 518 that four footing courses with offsets equal to one-fourth of the wall base will effect the necessary spread of the area of the foundations. Then, by means of the table at p. 420, giving the proportionate offsets in terms of the thickness of footing courses for various materials, a close approximation to the amount of the addition requisite to be made to the wall loads for the weight of the footings, and from these data to derive final corrections for foundation area to adjust the ultimate unit pressure of the footing base to the safe bearing power of the soil in question. The geometrical centre of the cross-section of the footings thus obtained, which are symmetrical, must be placed vertically underneath the centre of gravity of the wall loads previously obtained, so that the first resultant of wall loads and second resultant of footing weights coincide in the same vertical axis, and thus produce uniform pressure all over the footing area upon the underlying soil. The position that the resultant of the wall loads r , Fig. 22, is here assumed to strike the footing base of the house wall in as it may be designed according to the Metropolitan Building By-laws, first schedule (8), and which is the ordinary arrangement of the offsets, stands about one-twelfth of the breadth of the base to the left side of its geometrical centre, C, which will cause an unequal distribution of pressure, as it will be more intense on the left side, which represents the shorter arm of a lever, causing it to sink deeper in the soil, than on the right side, representing the longer arm. The corrected position of the footings necessitates their being

moved bodily this eccentric distance towards the left-hand side, so that the relation of the wall-base to the footings will be changed from the position of the wall-base shown at A, Fig. 21, to that shown by the section B, which consequently overlaps the top footing course on the right-hand side. The arrow $e' r'$ indicates this new relation, whereby the geometrical centre of the footing base is brought vertically underneath the resultant of the wall-loads r , and thereby equalises the pressure upon the soil underlying the base of the foundations. Fig. 22 shows the footings drawn symmetrically within the extreme verticals, drawn down from the wall-base, showing the relative position of the resultant r , drawn directly from G, and showing eccentric action upon the usual symmetrical footing-base, as arranged by rule-of-thumb. In cases of great eccentricity of the resultant of the wall-loads r , it may be necessary to readjust some of the offsets on either side of the footings, so that their transverse strength shall be equalised at such points of eccentric wall-loading.

(To be continued.)

MONTAUK CLUB-HOUSE, BROOKLYN, NEW YORK.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

THE instructions to competing architects were to cover a plot 50ft. by 90ft. The prominent position which this building was to occupy, being near the entrance to Prospect Park, one end, the one with the large bay, bordering on the Plaza Circle, a favourite drive of Brooklyn people of an afternoon, called for a building of some architectural effect. The prevailing style of the private residences in the vicinity is the Romanesque. This made it imperative that the club should "change off" if it desired to hold up its head very proudly and prominently in the midst of so much richness of detail as had been portrayed in the Romanesque. There seemed to the architect much in Venice which might be adapted, as balconies and loggias belong as much to his climate as Venice, and American club houses are

not complete without them. The style afforded strong colouring in the materials used, although in this instance violent contrasts were avoided. In the first story alternate colours of brown sandstone and the English Runcorn stone are used, but barely distinguishable, although enough to give texture to the wall surface. Above is used a yellowish red brick, the relief work in red and buff terracotta, the buff predominating. The roof is covered with vitrified Spanish tiles of a dark reddish brown, harmonising with the wall treatment and presenting a strong sky-line. The balcony at the fourth story level encircles the building and is of metal. The most prominent terracotta enrichment is the frieze just under this balcony. The subject was suggested by the name of the club, which name belongs to a tribe of Indians who were settled in this region before the colonial times. The subject begins with mythologic and legendary stories of these Indians, and ends with pictures suggested by colonial history. The figures are of yellow with a red background. In the arrangement of the interior the intention was to place in the basement the bowling alleys, on the first story the conversation and morning rooms, the second the billiard and card rooms, the third various dining rooms, including the ladies' dining-room and ladies' parlour, the fourth the sleeping apartments with a "jolly room," so called, where it is expected members will retire for quiet chats and smokes. On this floor is the kitchen and pantries, connected by dumb waiters with the serving rooms and dining rooms in the story under. Thus each story has its purpose. On the first one enters and holds conversation, above he plays his games, up another flight of stairs he dines, and when he would steal away for quiet enjoyment with some boon companions, the fourth floor with its "jolly room" awaits him. From the billiard-room is a loggia connecting with an open balcony, from the dining-room there is another balcony, and the fourth floor has the broad balcony which encircles the building for a promenade. The first floor is finished entirely in mahogany, the second story in oak, and the third treated in white and gold. After an

occupancy of over a year, the arrangements have been found all that could be desired, and seems to secure the perfection of a social club-house.
F. H. KIMBALL, Architect, New York.

PRICES.*—L.

(All Trade Discounts have been taken off, and Profit added.)

IRONMONGER (continued).

SAFES AND IRON DOORS (delivered only)—	
24 by 18 by 18, ordinary good quality safe, wrought-iron cases, three bolts, and lever lock, and having one drawer inside	each 7 10 0
24 by 20 by 20 ditto with two drawers and a partition	ditto 8 15 0
28 by 22 by 22 ditto ditto	ditto 9 10 0
30 by 24 by 22 ditto ditto	ditto 10 10 0
33 by 24 by 24 ditto ditto	ditto 11 11 0
36 by 24 by 24 ditto ditto	ditto 12 15 0

8ft. by 2ft., wrought-iron door 3in. thick, hung in 3in. by 3in. frame, with 2 1/2 in. by 3in. rebate bar, 3 1/2 in. filled lock-case, and fitted with brass lever handle, to throw four bolts, and having three fixed bolts at back, and secured by seven-sided, unpickable, gunpowder-proof locks, protected by hardened steel plates	ditto 12 15 0
8ft. 6in. by 2ft. 6in. ditto ditto	ditto 14 0 0
8ft. 6in. by 3ft. 6in. ditto ditto	ditto 15 15 0
8ft. 6in. by 2ft. 9in. ditto ditto	ditto 16 0 0
8ft. 6in. by 2ft. 6in., special strong-room door, 3in. thick, fitted with good lever lock, four bolts in front and three at back	ditto 8 0 0

7ft. by 3ft., sliding warehouse doors (Smith and Stevens') of 1/2 plates, with 1/2-plate stiles and rails, hung with strong wrought-iron straps, with turned 6in. pulleys, running on wrought-iron top bar A-shaped, and with guiding grooved hasp, staple, and loop handles	ditto 5 0 0
7ft. by 4ft. ditto ditto	ditto 6 10 0
7ft. by 5ft. ditto ditto	ditto 8 5 0
7ft. by 6ft. ditto ditto	ditto 9 10 0
8ft. by 4ft. ditto ditto	ditto 7 10 0
8ft. by 5ft. ditto ditto	ditto 9 10 0
8ft. by 6ft. ditto ditto	ditto 11 5 0
8ft. by 7ft. ditto ditto	ditto 13 0 0
8ft. by 8ft. ditto ditto	ditto 15 0 0

8ft. by 3ft., swing door, with middle and bottom rail, and hung in wrought-iron frames of 3in. by 3in. with 2in. by 3in. rebate bars, and fitted with good lever deadlock and two-barrel bolts	ditto 8 8 0
8ft. by 3ft. 6in. ditto ditto	ditto 9 8 0
8ft. by 4ft. ditto ditto	ditto 10 8 0
7ft. by 3ft. ditto ditto	ditto 9 8 0
7ft. by 4ft. ditto ditto	ditto 11 14 0
7ft. by 5ft. ditto ditto	ditto 14 0 0
8ft. by 4ft. ditto ditto	ditto 12 10 0
8ft. by 5ft. ditto ditto	ditto 16 0 0
8ft. by 6ft. ditto ditto	ditto 19 4 0

(The larger sizes are made as pairs of doors.)

8ft. by 2ft., fire and thief-resisting (special quality), with 3in. door-plates, 3in. by 2 1/2 in. rebate bar, 3in. frame, four front bolts, and three dogs at back, patent unpickable lock, two keys	each 12 15 0
8ft. 6in. by 2ft. 6in. ditto ditto	ditto 14 0 0
8ft. 6in. by 3ft. ditto ditto	ditto 15 15 0
8ft. 6in. by 2ft. 9in. ditto ditto	ditto 15 10 0
8ft. by 2ft. ditto, extra quality, throwing four bolts at front, and four at back, big brass handle	ditto 14 15 0
8ft. by 2ft. 6in. ditto ditto	ditto 16 5 0
6ft. by 3ft. ditto ditto	ditto 17 10 0
6ft. by 2ft. ditto, doorplates 3in., and frame and rebates 3in.	ditto 18 12 0
6ft. by 2ft. 6in. ditto ditto	ditto 18 5 0
6ft. by 3ft. ditto ditto	ditto 19 12 0
6ft. by 2ft. ditto, with 3in. doorplates and 3in. rebates and frames	ditto 17 15 0
8ft. by 2ft. 6in. ditto ditto	ditto 19 6 0
8ft. by 3ft. ditto ditto	ditto 20 12 0
8ft. by 2ft. ditto, with all plates 3in.	ditto 19 5 0
8ft. by 2ft. 6in. ditto ditto	ditto 21 0 0
8ft. by 3ft. ditto ditto	ditto 22 18 0

(The above are fireproof; they are about 15 per cent. less if not fireproof.)

HOBBS AND CO.'S Safes and Doors. (Take 10 per cent. off all "Hobbs'" safes, &c., that follow, delivered on ground floor only.)

FIRE-RESISTING Safes and Chests—

22 by 16 by 16, no inside fittings	each 7 0 0
24 by 18 by 18 ditto ditto	ditto 8 5 0
26 by 20 by 20 ditto ditto	ditto 9 7 0
28 by 22 by 22 ditto ditto	ditto 10 0 0
30 by 24 by 24 ditto ditto	ditto 12 13 0

CUPBOARD Stands—

Stands for safes of the following dimensions and 28in. high, door paneled, and sides, and fitted with lever locks, fixed in place:

23 by 17 by 17, with cornice and moulded base	each 1 16 0
25 by 19 by 19 ditto ditto	ditto 1 19 0
27 by 21 by 21 ditto ditto	ditto 2 3 0
29 by 23 by 23 ditto ditto	ditto 2 5 0
31 by 25 by 25 ditto ditto	ditto 2 6 0
33 by 27 by 27 ditto ditto	ditto 2 7 6
37 by 28 by 27 ditto ditto	ditto 2 11 0
45 by 28 by 27 ditto ditto	ditto 2 13 0

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STRONG SKELETON Frame Safe Stands—	
23 by 17 by 17, fixed to floor	each 0 15 6
25 by 19 by 19 ditto	ditto 0 17 6
27 by 21 by 21 ditto	ditto 0 17 6
29 by 23 by 23 ditto	ditto 0 18 9
31 by 25 by 25 ditto	ditto 0 19 6
33 by 27 by 27 ditto	ditto 1 0 6
37 by 28 by 27 ditto	ditto 1 3 0
45 by 28 by 27 ditto	ditto 1 4 0

GUNPOWDER and Ammunition Safes—	
87 by 23 by 27, outside, to hold 2cwt. of powder	ditto 20 0 0

SEAMLESS Fire-Resisting (single door)

Book Safes, no inside fittings—	
23 by 17 by 17, delivered on ground floor	ditto 9 5 0
25 by 19 by 19 ditto	ditto 10 10 0
27 by 21 by 21 ditto	ditto 12 0 0
29 by 23 by 23 ditto	ditto 14 10 0
31 by 25 by 25 ditto	ditto 16 10 0
33 by 27 by 27 ditto	ditto 18 10 0
37 by 28 by 27 ditto	ditto 21 10 0
23 by 27 by 27 with 2 drawers	ditto 11 0 0
25 by 19 by 19 ditto	ditto 12 10 0
27 by 21 by 21 ditto	ditto 14 10 0
29 by 23 by 23 ditto	ditto 16 10 0
31 by 25 by 25 ditto	ditto 18 10 0
33 by 27 by 27 ditto	ditto 21 0 0
37 by 28 by 27 ditto	ditto 23 10 0

FIRE-RESISTING single-door Book-Safes—	
25 by 19 by 19 with 2 drawers at bottom	ditto 16 10 0
27 by 21 by 21 ditto	ditto 18 15 0
29 by 23 by 22 ditto	ditto 21 0 0
31 by 25 by 25 ditto	ditto 24 0 0
33 by 27 by 27 ditto	ditto 27 5 0
37 by 28 by 27 ditto	ditto 29 15 0
45 by 28 by 27 D-pattern, having two drawers and one division, throwing four front bolts in front	ditto 59 10 0
53 by 31 by 27 M-pattern	ditto 43 0 0
61 by 33 by 27 D-pattern, two drawers and two shelves	ditto 59 0 0
Ditto ditto one shelf	ditto 58 5 0
Ditto ditto one long drawer, two short, and a shelf	ditto 63 0 0

SEAMLESS fire-resisting, double-door

Book-Safes—	
37 by 35 by 27 H H pattern, two drawers at bottom, two partitions, and shelf	ditto 42 10 0
49 by 37 by 27 two drawers in middle	ditto 55 0 0
58 by 43 by 30 ditto at bottom, two shelves above	ditto 79 0 0
69 by 55 by 30 ditto three drawers in middle and one cupboard at top with double doors	ditto 108 0 0
85 by 63 by 30 ditto six drawers in middle, four upright partitions, and two cupboards at top	ditto 139 0 0

EXTRA-STRONG, seamless, fire-resisting, single-door, clutch-bolt steel Safes, rust, damp, fire, and thief resisting—

25 by 19 by 19 no fittings and having clutch-bolts all round	ditto 24 10 0
27 by 21 by 21 ditto	ditto 26 15 0
29 by 23 by 23 ditto	ditto 29 10 0
31 by 25 by 25 ditto	ditto 34 0 0
33 by 27 by 27 ditto	ditto 38 0 0
37 by 28 by 27 ditto	ditto 44 0 0
27 by 21 by 21 ditto with 2 drawers	ditto 29 10 0
29 by 23 by 23 ditto	ditto 33 0 0
31 by 25 by 25 ditto	ditto 37 0 0
33 by 27 by 27 ditto	ditto 42 0 0
37 by 28 by 27 ditto	ditto 47 0 0
45 by 28 by 27 ditto and one shelf	ditto 53 0 0
53 by 31 by 27 ditto	ditto 64 0 0
61 by 33 by 27 ditto	ditto 73 0 0

DOUBLE-DOOR ditto—

37 by 35 by 27 with 9-lever lock and protected with cheek lock for dual custody and 1 1/2 welded iron and steel plates to resist drilling	ditto 55 0 0
49 by 37 by 27 two drawers at bottom, two partitions, and one shelf above	ditto 77 0 0
58 by 43 by 30 two drawers and two shelves	ditto 104 0 0
69 by 55 by 30 three drawers in middle and one cupboard at top, with double doors	ditto 148 0 0
85 by 63 by 30 six drawers in middle, four upright partitions, and two cupboards at top, double doors	ditto 187 0 0

DOORS and FRAMES for strong-rooms,

quality No. 2—	
5ft. 6in. by 2ft. 2in. with angle-iron frames	ditto 17 0 0
6ft. 6in. by 2ft. 6in. ditto	ditto 18 0 0
6ft. 6in. by 2ft. 9in. ditto	ditto 20 0 0
6ft. 6in. by 3ft. 6in. ditto	ditto 23 0 0
7ft. 6in. by 3ft. 6in. ditto	ditto 25 0 0
6ft. 6in. by 2ft. 6in. ditto quality No. 3	ditto 25 0 0
6ft. 6in. by 2ft. 9in. ditto	ditto 29 0 0
6ft. 6in. by 3ft. 6in. ditto	ditto 31 0 0
6ft. 6in. by 3ft. 6in. ditto	ditto 34 0 0
7ft. 6in. by 3ft. 6in. ditto	ditto 36 0 0

These doors are provided with two Hobbs 8-lever locks for dual custody.

6ft. 6in. by 3ft. 6in. patent clutch-bolts with two locks (9-lever)	ditto 33 0 0
6ft. 6in. by 2ft. 9in. ditto	ditto 35 10 0
6ft. 6in. by 2ft. 9in. ditto	ditto 38 0 0
6ft. 6in. by 3ft. 6in. ditto	ditto 41 0 0
7ft. 6in. by 3ft. 6in. ditto	ditto 43 10 0

VENTILATING GATES and Frames—

6ft. 1 1/2 in. by 2ft. 7 1/2 in. outside frame, and light quality	ditto 8 5 0
6ft. 4 1/2 in. by 2ft. 10 1/2 in. ditto	ditto 9 5 0
6ft. 7 1/2 in. by 2ft. 10 1/2 in. ditto	ditto 10 10 0
6ft. 10 1/2 in. by 3ft. 1 1/2 in. ditto	ditto 11 15 0
7ft. 1 1/2 in. by 3ft. 1 1/2 in. ditto	ditto 13 10 0
6ft. 1 1/2 in. by 2ft. 7 1/2 in. ditto	ditto 12 10 0
6ft. 4 1/2 in. by 2ft. 10 1/2 in. ditto	ditto 13 10 0
6ft. 7 1/2 in. by 2ft. 10 1/2 in. ditto	ditto 15 0 0
6ft. 1 1/2 in. by 3ft. 1 1/2 in. ditto	ditto 17 0 0
7ft. 1 1/2 in. by 3ft. 1 1/2 in. ditto	ditto 18 10 0

CHUBB'S SAFES (jeweller's)—

2ft. 6in. by 1ft. 7in. by 1ft. 6in. delivered only, with diagonal bolts all round the doors	each 32 0 0
Ditto ditto with two shelves	ditto 33 0 0
Ditto ditto with one drawer	ditto 34 0 0
2ft. 2in. by 1ft. 8in. by 1ft. 8in. no fittings	ditto 35 0 0
Ditto ditto two shelves	ditto 35 10 0
Ditto ditto 1 drawer and shelf or 1 division	ditto 37 0 0
2ft. 4in. by 1ft. 10in. by 1ft. 10in. no fittings	ditto 38 15 0
Ditto ditto 2 shelves	ditto 39 5 0
Ditto ditto 1 drawer and division or shelf	ditto 40 10 0
2ft. 6in. by 2ft. 6in. by 1ft. 11in. no fittings	ditto 42 0 0
Ditto ditto 2 shelves	ditto 42 10 0
Ditto ditto 1 drawer and division	ditto 43 15 0
2ft. 9in. by 2ft. 2in. by 2ft. no fittings	ditto 40 10 0
Ditto ditto 2 shelves	ditto 47 0 0
Ditto ditto 2 drawers and shelf	ditto 49 15 0
Ditto ditto 1 division, 1 drawer, and 1 shelf	ditto 43 10 0
Ditto ditto 1 division, 1 shelf	ditto 43 5 0
2ft. 7in. by 2ft. 3in. by 2ft. 2in. 2 drawers, shelf, and division	ditto 51 10 0
2ft. 10in. by 2ft. 4in. by 2ft. 3in. ditto	ditto 54 10 0
3ft. 6in. by 2ft. 3in. by 2ft. 1in. no fittings	ditto 53 10 0
Ditto ditto 2 shelves	ditto 51 5 0
Ditto ditto ditto and 1 drawer	ditto 53 5 0
Ditto ditto 1 division, 1 shelf, and 2 drawers	ditto 55 0 0
3ft. 4in. by 2ft. 4in. by 2ft. 1in. no fittings	ditto 50 0 0
Ditto ditto 2 shelves	ditto 58 0 0
Ditto ditto ditto and 2 drawers	ditto 59 0 0
Ditto ditto 3 drawers 1 division	ditto 60 0 0
Ditto ditto fitted with a solid coffer of hard steel and wrought iron	ditto 75 10 0
3ft. 8in. by 2ft. 6in. by 2ft. 2in. 3 shelves	ditto 64 0 0
Ditto ditto 3 drawers 1 division	ditto 67 10 0
4ft. 2in. by 2ft. 6in. by 2ft. 2in. 3 shelves (shifting)	ditto 70 0 0
Ditto ditto 1 shelf and 3 drawers	ditto 73 10 0
4ft. 8in. by 2ft. 6in. by 2ft. 3in. 8 shelves	ditto 78 0 0
Ditto ditto 1 division 2 shelves	ditto 81 10 0
5ft. 2in. by 2ft. 8in. by 2ft. 3in. 1 shelf	ditto 93 10 0
3 drawers	ditto 93 10 0
2ft. 11in. by 2ft. 7in. by 1ft. 11in. double door, 2 drawers, 1 shelf and 1 division	ditto 70 10 0
Ditto ditto divided into 2 safes, and having 1 shelf and 2 drawers	ditto 81 0 0
3ft. 4in. by 2ft. 11in. by 2ft. 1in. 2 divisions, 2 shelves, and 2 drawers	ditto 83 0 0
3ft. 4in. by 2ft. 11in. by 2ft. 3in. (in two)	ditto 97 0 0
3 shelves and 3 drawers	ditto 97 0 0
3ft. 8in. by 3ft. 2in. by 2ft. 2in. 2 divisions, 2 shelves, and 2 drawers	ditto 91 0 0
3ft. 8in. by 3ft. 2in. by 2ft. 5ft. (2 safes)	ditto 109 0 0
2 shelves, 3 drawers	ditto 109 0 0
4ft. 2in. by 3ft. 6in. by 2ft. 8in. 2 divisions, 1 shelf, 4 drawers	ditto 106 0 0
4ft. 2in. by 3ft. 6in. by 2ft. 7in. (2 safes)	ditto 129 0 0
2 shelves, 4 drawers	ditto 114 10 0
4ft. 2in. by 4ft. 2in. by 2ft. 5 divisions, 2 shelves, 3 drawers	ditto 132 0 0
5ft. 2in. by 3ft. 6in. by 2ft. 4in. 2 divisions, 2 shelves, 2 drawers	ditto 132 0 0
5ft. 8in. by 4ft. 2in. by 2ft. 4in. 3 divisions, 2 shelves, 3 drawers	ditto 173 0 0
6ft. 2in. by 3ft. 8in. by 2ft. 4in. 2 divisions, 1 shelf, 5 drawers	ditto 171 0 0
6ft. 8in. by 3ft. 10in. by 2ft. 6in. 3 divisions, 2 shelves, 5 drawers	ditto 196 0 0
7ft. 2in. by 4ft. 2in. by 2ft. 8in. 5 divisions, 1 shelf, 10 drawers	ditto 217 0 0

BEST QUALITY, Bankers' Safes, fitted with wheel locks throwing bolts all round the doors (diagonal bolts).

2ft. by 1ft. 7in. by 1ft. 6in. as above	ditto 51 5 0
Ditto ditto 2 shelves	ditto 53 10 0
Ditto ditto 1 drawer	ditto 52 0 0
2ft. 2in. by 1ft. 8in. by 1ft. 8in. no fittings	ditto 55 15 0
Ditto ditto 2 shelves	ditto 56 0 0
Ditto ditto 1 shelf, 1 drawer, 1 division	ditto 57 10 0
2ft. 4in. by 1ft. 10in. by 1ft. 10in. no fittings	ditto 62 5 0
Ditto ditto 2 shelves	ditto 62 15 0
Ditto ditto 1 shelf, 1 drawer	ditto 64 0 0
2ft. 6in. by 2ft. 1ft. 11in. no fittings	ditto 63 10 0
Ditto ditto 2 shelves	ditto 69 0 0
Ditto ditto 1 drawer, 1 division	ditto 70 5 0
2ft. 9in. by 2ft. 2in. by 2ft. no fittings	ditto 73 0 0
Ditto ditto 2 shelves	ditto 73 10 0
Ditto ditto 1 shelf, 2 drawers	ditto 70 5 0
Ditto ditto 1 shelf, 1 drawer, 1 division	ditto 75 0 0
Ditto ditto 1 drawer, 1 division	ditto 74 15 0
2ft. 7in. by 2ft. 3in. by 2ft. 2in. 1 shelf, 2 drawers, 1 division	ditto 77 10 0
2ft. 10in. by 2ft. 4in. by 2ft. 3in. 1 shelf, 2 drawers, 1 division	ditto 84 0 0
3ft. by 2ft. 3in. by 2ft. 1in. no fittings	ditto 79 5 0
Ditto ditto 2 shelves	ditto 83 0 0
Ditto ditto 2 shelves, 1 drawer	ditto 82 0 0
Ditto ditto 1 shelf, 2 drawers, 1 division	ditto 83 15 0
3ft. 4in. by 2ft. 4in. by 2ft. 1in. no fittings	ditto 88 0 0
Ditto ditto 2 shelves	ditto 87 0 0
Ditto ditto 2 shelves, 2 drawers	ditto 90 0 0
Ditto ditto 3 drawers, 1 division	ditto 91 0 0
Ditto ditto fitted with a coffer of hard steel and wrought iron	ditto 108 10 0
3ft. 8in. by 2ft. 6in. by 2ft. 2in. 3 shelves	ditto 100 10 0
Ditto ditto 3 drawers, 1 division	ditto 104 0 0
4ft. 2in. by 2ft. 6in. by 2ft. 2in. 3 shelves shifting	ditto 111 0 0
Ditto ditto 1 shelf, 3 drawers	ditto 114 10 0
4ft. 8in. by 2ft. 6in. by 2ft. 3in. 3 shelves, 2 drawers	ditto 124 10 0
Ditto ditto 1 division, 2 shelves	ditto 127 0 0
5ft. 2in. by 2ft. 8in. by 2ft. 3in. 1 shelf, 3 drawers	ditto 142 0 0
2ft. 11in. by 2ft. 7in. by 1ft. 11in. double door, 2 drawers, 1 shelf, 1 division	ditto 96 0 0

2ft. 11in. by 2ft. 7in. by 2ft. 1in. divided into two safes, and having 1 shelf and 2 drawers	each	107	0	0
3ft. 4in. by 2ft. 11in. by 2ft. 1in. 2 shelves, 2 drawers, 2 divisions	ditto	110	0	0
3ft. 4in. by 2ft. 11in. by 2ft. 3in. (in two) 3 shelves, 2 drawers	ditto	132	0	0
3ft. 5in. by 3ft. 2in. by 2ft. 2in. 2 shelves, 2 drawers, 2 divisions	ditto	133	0	0
3ft. 5in. by 3ft. 2in. by 2ft. 5in. (in two) 2 shelves, 3 drawers	ditto	154	0	0
4ft. 2in. by 3ft. 5in. by 2ft. 5in. 1 shelf, 4 drawers, 2 divisions	ditto	158	0	0
4ft. 2in. by 3ft. 5in. by 2ft. 7in. (in two) 2 shelves, 4 drawers	ditto	182	0	0
4ft. 2in. by 4ft. 2in. by 2ft. 2 shelves, 3 drawers, 3 divisions	ditto	169	0	0
5ft. 2in. by 3ft. 6in. by 2ft. 4in. 2 shelves, 2 drawers, 2 divisions	ditto	189	0	0
5ft. 5in. by 4ft. 2in. by 2ft. 4in. 2 shelves, 3 drawers, 3 divisions	ditto	241	0	0
6ft. 2in. by 3ft. 8in. by 2ft. 4in. 1 shelf, 5 drawers, 2 divisions	ditto	237	0	0
6ft. 5in. by 3ft. 10in. by 2ft. 6in. 2 shelves, 5 drawers, 3 divisions	ditto	275	0	0
7ft. 2in. by 4ft. 9in. by 2ft. 5in. 1 shelf, 10 drawers, 5 divisions	ditto	335	0	0

QUALITY C, a cheaper Safe—

No. 1 1ft. 10in. by 1ft. 5in. by 1ft. 4in. no fitting	ditto	10	10	0
2 Ditto 2 shelves	ditto	10	15	0
3 Ditto 1 shelf, 1 drawer	ditto	12	5	0
4 2ft. by 1ft. 6in. by 1ft. 6in. no fittings	ditto	12	10	0
5 Ditto 2 shelves	ditto	12	15	0
6 Ditto 1 shelf, 1 drawer	ditto	14	5	0
7 Ditto 1 division, 1 drawer	ditto	14	5	0
8 2ft. 2in. by 1ft. 8in. by 1ft. 8in. no fittings	ditto	15	0	0
9 Ditto 2 shelves	ditto	15	10	0
10 Ditto 1 shelf, 1 drawer	ditto	16	15	0
11 Ditto 1 division, 1 drawer	ditto	16	15	0
12 Ditto 1 division, 1 drawer (small)	ditto	16	15	0
13 2ft. 4in. by 1ft. 10in. by 1ft. 9in. no fittings	ditto	17	10	0
14 Ditto 2 shelves	ditto	18	0	0
15 Ditto 1 shelf, 1 drawer	ditto	19	5	0
16 Ditto 1 division, 1 drawer	ditto	19	5	0
17 Ditto 1 division (varied)	ditto	19	5	0
18 2ft. 7in. by 2ft. by 1ft. 10in. no fittings	ditto	20	10	0
19 Ditto 2 shelves	ditto	21	0	0
20 Ditto 1 shelf, 2 drawers	ditto	23	15	0
21 Ditto 1 division, 1 shelf, 1 drawer	ditto	22	10	6
22 Ditto 1 division, 1 drawer	ditto	22	5	0
23 2ft. 5in. by 2ft. 1in. by 2ft. 1 shelf, 2 drawers, 1 division	ditto	26	0	0
24 2ft. 5in. by 2ft. 2in. by 2ft. 1 shelf, 2 drawers, 1 division	ditto	29	0	0
25 2ft. 10in. by 2ft. 1in. by 1ft. 11in. no fittings	ditto	24	0	0
Wheel mounts 35s extra.				
26 Ditto 2 shelves	ditto	24	15	0
27 Ditto 2 shelves, 1 drawer	ditto	26	10	0
28 Ditto 1 shelf, 2 drawers, 1 division	ditto	27	10	0
29 3ft. 2in. by 2ft. 2in. by 1ft. 11in. no fittings	ditto	28	0	0
30 Ditto 2 shelves	ditto	29	0	0
31 Ditto 2 shelves, 2 drawers	ditto	32	0	0
32 Ditto 1 division, 3 drawers	ditto	33	0	0
33 Ditto with coffer and shelf	ditto	48	10	0
34 3ft. 6in. by 2ft. 4in. by 2ft. 0in. 3 shelves	ditto	34	10	0
35 Ditto 1 division, 3 drawers	ditto	38	0	0
36 4ft. by 2ft. 4in. by 2ft. 3 shelves	ditto	36	15	0
37 ditto 1 ditto	ditto	42	0	0
38 Ditto ditto no fittings	ditto	36	15	0
39 4ft. 6in. by 2ft. 4in. by 2ft. 1in. 3 shelves	ditto	44	10	0
40 Ditto 1 division, 2 shelves	ditto	47	0	0
41 5ft. by 2ft. 6in. by 2ft. 1in. 1 division 1 shelf	ditto	58	0	0
42 2ft. 9in. by 2ft. 5in. by 1ft. 11in. 1 shelf	ditto	35	0	0
43 3ft. 2in. by 2ft. 9in. by 1ft. 11in. 2 shelves, 2 divisions	ditto	40	0	0
44 3ft. 2in. by 2ft. 9in. by 2ft. 1in. 2 shelves in 2 safes	ditto	47	10	0
45 3ft. 6in. by 3ft. by 2ft. 2 shelves, 2 divisions	ditto	42	0	0
46 3ft. 6in. by 2ft. by 2ft. 3in. 2 shelves in 2 safes	ditto	52	10	0
47 4ft. by 3ft. 3in. by 2ft. 1in. 1 shelf, 2 divisions	ditto	53	0	0
48 4ft. by 3ft. 3in. by 2ft. 5in. 2 shelves in 2 safes	ditto	66	0	0
49 4ft. by 4ft. by 1ft. 10in. 2 shelves, 5 divisions	ditto	65	10	0
50 5ft. by 3ft. 4in. by 2ft. 2ft. 2 shelves, 2 divisions	ditto	78	10	0
51 5ft. 6in. by 4ft. by 2ft. 2in. 2 shelves, 3 divisions	ditto	108	0	0
52 6ft. by 3ft. 6in. by 2ft. 2in. 1 shelf, 2 divisions	ditto	106	0	0
53 6ft. 6in. by 3ft. 5in. by 2ft. 4in. 2 shelves, 4 divisions	ditto	125	0	0
54 7ft. by 4ft. by 2ft. 6in. 3 shelves, 2 cupboards, 5 divisions	ditto			

WHEEL MOUNTINGS, for safes—

0. 1 to No. 23	ditto	1	5	0
24 to 39	ditto	1	15	0
40 to 49	ditto	2	5	0
50 to 52	ditto	2	15	0
53 to 54	ditto	3	10	0

Safes are made with additional key-locks differing from each other at an extra charge of £2 each lock.

Combination keyless locks at an extra of £3 10s.

OVAL STRONG ROOM—

1 6ft. 6in. by 5ft. by 6ft. quality D...	each	363	0	0
Ditto	ditto	590	0	0
2 7ft. by 6ft. by 7ft. ditto D...	ditto	463	0	0
Ditto	ditto	770	0	0
3 7ft. by 7ft. by 8ft. ditto D...	ditto	540	0	0
Ditto	ditto	930	0	0

FIRE SAFES—

No. 1 1ft. 10in. by 1ft. 5in. by 1ft. 4in. no fittings	each	7	15	0
2 Ditto 2 shelves	ditto	8	0	0
3 Ditto 1 shelf, 1 drawer	ditto	8	17	6
4 2ft. by 1ft. 6in. by 1ft. 6in. no fittings	ditto	9	5	0
5 Ditto 2 shelves	ditto	9	10	0
6 Ditto 1 shelf, 1 drawer	ditto	10	7	6
7 Ditto 1 partition, 1 drawer	ditto	10	7	6
8 2ft. 2in. by 1ft. 8in. by 1ft. 8in. no fittings	ditto	11	5	0
9 Ditto 2 shelves	ditto	11	15	0
10 Ditto 1 shelf, 1 drawer	ditto	12	10	0
11 Ditto 1 partition, 1 shelf	ditto	12	10	0
12 Ditto 1 partition, 1 drawer	ditto	12	10	0
13 2ft. 4in. by 1ft. 10in. by 1ft. 9in. no fittings	ditto	13	0	0
14 Ditto 2 shelves	ditto	13	10	0
15 Ditto 1 shelf, 1 drawer	ditto	14	10	0
16 Ditto 1 partition, 1 drawer	ditto	14	10	0
17 Ditto ditto ditto	ditto	14	10	0
18 2ft. 7in. by 2ft. by 1ft. 10in. no fittings	ditto	15	5	0
19 Ditto 2 shelves	ditto	15	15	0
20 Ditto 1 shelf, 2 drawers	ditto	17	10	0
21 Ditto 1 partition, 1 shelf, 1 drawer	ditto	17	0	0
22 Ditto 1 partition, 1 drawer	ditto	16	15	0
25 2ft. 10in. by 2ft. 1in. by 2ft. 1in. no fittings	ditto	18	0	0
26 Ditto 2 shelves	ditto	18	15	6
27 Ditto 2 shelves, 1 drawer	ditto	20	5	6
28 Ditto 1 partition, 1 shelf, 2 drawers	ditto	21	0	0
29 3ft. 2in. by 2ft. 2in. by 1ft. 11in. no fittings	ditto	21	0	0
30 Ditto 2 shelves	ditto	22	0	0
31 Ditto 2 shelves, 2 drawers	ditto	24	10	0
32 Ditto 1 drawer, 1 partition	ditto	25	5	0

(Keyless lock, £3 extra.)

FIRE-RESISTING CHESTS—

13 by 10 by 7 outside	each	4	5	0
15 by 11 by 8 ditto	ditto	4	15	0
17 by 12 by 9 ditto	ditto	5	0	0
19 by 13 by 10 ditto	ditto	5	5	0
19 by 13 by 13 ditto	ditto	6	6	0
19 by 14 by 14 ditto	ditto	6	15	0
21 by 14 by 14 ditto	ditto	7	18	0
21 by 16 by 14 ditto	ditto	8	15	0
Extra for wheel mounts	ditto	1	5	0

CHESTS FOR BULLION PLATE—

13 by 10 by 7 outside	ditto	3	15	6
15 by 11 by 8 ditto	ditto	4	5	6
17 by 12 by 9 ditto	ditto	4	10	0
19 by 13 by 10 ditto	ditto	4	15	0
19 by 13 by 13 ditto	ditto	5	10	0
19 by 14 by 14 ditto	ditto	6	0	0

STANDS—

For safes No. 1 to 3	ditto	1	6	0
Ditto 4 to 7	ditto	1	6	0
Ditto 8 to 12	ditto	1	8	0
Ditto 13 to 17	ditto	1	8	0
Ditto 18 to 22	ditto	1	10	0

STANDS FOR SMALLER FOLDING DOOR SAFES—

For No. 41	ditto	1	18	0
Ditto 43	ditto	2	0	0

ROBERT BOYLE AND SON, LIMITED.

THE directors of Robert Boyle and Son, Limited, ventilating engineers, London and Glasgow, have resolved to recommend a dividend of 12½ per cent., free of income-tax, for the year ending September last, after placing to the reserve fund one-sixth of the profits earned and carrying forward £1,386 4s. 9d. This makes the seventh dividend, 12½ per cent. being paid for the last three years, and 12 per cent. for the previous years. The directors propose that the dividend for the current year will balance the subscribed capital of the company, including the ordinary shares held by the vendor, when cent. per cent. will have been paid.

The business done during the year has been considerably in excess of the previous year, though that was the most profitable year since the formation of the company. The directors attribute this success, and their consequent ability to pay such a handsome dividend, to their constant study of the requirements of architects, and to the great and ever-increasing demand for the latest improved form of the self-acting air-pump ventilator, which, though much superior in design, make, and action, is now sold at 50 per cent. less than previous and inferior forms, constituting it not only the most efficient and ornamental, but the cheapest, ventilator in the market.

The company have at present some very important contracts in hand at home and abroad, including the largest ventilating contract they have ever received from the British Government, and a contract of equal magnitude for the Spanish Government.

Mr. Robert Boyle has recently visited the East and Australasia, and has established agencies in Burmah, Queensland, New South Wales, Victoria, South Australia, and New Zealand, arrangements having also been made for the manufacture of the different ventilating and

sanitary appliances in each of the Australian colonies and New Zealand. Mr. Boyle has surveyed and submitted plans for the ventilation of the new Jubilee Hall, Rangoon; King of Siam's Palace, Bangkok; Government Buildings and Museum, Batavia; the Chicago Exhibition buildings; Houses of Parliament, Centennial Hall, Municipal Buildings, new Hospital, and new Theatre, Sydney; Houses of Parliament, Stock Exchange, Commercial Bank, and Bank of Victoria, Melbourne; also for the complete ventilation of the new drainage scheme, Melbourne. At Adelaide the air-pump ventilators have been applied to the Houses of Parliament, Government House, Government Buildings, Supreme Courts, Post-office, Hospital, Art Gallery, Museum, University, and other public buildings. At Christchurch, New Zealand, the house drainage is exclusively ventilated with the air-pump ventilators. They are also applied to the Houses of Parliament, Government House, Government Buildings, Post-office, Supreme Courts, Hospital, Opera-house, &c., Wellington.

"BUILDING NEWS" DESIGNING CLUB.

AWARD OF PRIZES, SESSION 1890-91.

THE fifteenth year of our Designing Club has now concluded, and the following subjects were thus competed for by members:—

A.—Convalescent Home.—"Smilash the Goth," 1; "Ayrshire," 2; "McGinty," 3; "Hilarious," 4; "Symbol," 5.

B.—A small House for an Artist, with Studio.—"Vulcan," 1; "Smilash the Goth," 2; "Cotonopolitan," 3; "McGinty," 4; "Jean," 5.

C.—A Parish Hall.—"Nil Nisi Bonum," 1; "Smilash the Goth," 2; "Vulcan," 3; "Firefly," 4; "Unitate Fortior," 5.

D.—Dining-room Chiffonier and Chair.—"Smilash the Goth," 1; "Nil Nisi Bonum," 2; "Black Prince," 3; "Cruiser," 4; "Signor C.," 5.

E.—Pair of Labourers' Cottages.—"Vulcan," 1; "Van Demon," 2; "Symbol," 3; "Smilash the Goth," 4; "McGinty," 5.

F.—A small Post-office for a Country Town.—"Smilash the Goth," 1; "Vulcan," 2; "Nil Nisi Bonum," 3; "Unitate Fortior," 4; "Nimrod," 5.

G.—A Drawing-room Cabinet.—"Smilash the Goth," 1; "Vulcan," 2; "Nil Nisi Bonum," 3; "La Cigale," 4; "Black Prince," 5.

H.—A Summer house.—"Vulcan," 1; "Smilash the Goth," 2; "Nil Nisi Bonum," 3; "Unitate Fortior," 4; "Pastime," 5.

I.—A Seaside Bath-house.—"Vulcan," 1; "Smilash the Goth," 2; "Unitate Fortior," 3; "Firefly," 4; "Neufardi," 5.

J.—A Highland Shooting-box.—"Vulcan," 1; "Nil Nisi Bonum," 2; "Smilash the Goth," 3; "Unitate Fortior," 4; "Black Prince," 5.

From the above list it will be seen that "Smilash the Goth," coming 4 times 1st, 4 times 2nd, once 3rd, and once 4th, takes the leading prize, having obtained a foremost position on every occasion, and contributed a design for each subject. The second prize is secured by "Vulcan" with 5 firsts, 2 seconds, and 1 third. "Nil Nisi Bonum" wins the third prize by being once 1st, twice 2nd, and three times third. Hon. mention is obtained by "Unitate Fortior," who ranks 4th (C. H. B. Quennell, 44, Lower Kensington-lane), and "McGinty" (J. E. Goodacre, Manor-road, Liscard, Cheshire), who comes in fifth.

The following prizes are therefore awarded accordingly:—

"Smilash the Goth" (G. L. Morris, 59, Blomfield-road, Maida Hill, W.), £10 10s.
"Vulcan" (name and address wanting), £5 5s.

"Nil Nisi Bonum" (W. A. Forsyth, The Studio, Finchley New-road, N.W.), £3 3s.

CONDITIONS FOR 1891-1892.

The following list of rules must be observed in every particular by all competitors:—

1. Drawings to be sent in 28 days after the publication of the list of subjects.
2. Usually two subjects will be given every month, from which a competitor may choose.
3. The drawings to be executed in firm black lines on white drawing-paper, in sheets of the

absolute size of 22in. by 14in., with no washes or tinting in colour whatever. Outline to be the first consideration; but drawings may be slightly shaded with shadows executed wholly in line. Sectional parts to be shown in ruled "hatching" or blocked in. The scale to be used will be given with each subject.

4. Drawings to be forwarded unmounted, by post, care being taken to roll the short way of the drawing, as packages over 18in. long are not transmissible by book post.

5. On entering the class (which may be done at any time), each competitor is required to furnish his name and address, which must be written legibly on the back of each drawing, as a guarantee of good faith, the *nom de plume* the author intends to adopt being boldly marked on the front of each separate drawing.

6. Prizes of £10 10s., £5 5s., and £3 3s. will be awarded to the best series of designs, each series not to consist of less than six subjects. Our decision to be final.

7. Before awarding the prizes any contributor will be expected to furnish proof, if necessary, as to his age, and the time during which he has been engaged in professional pursuits, though no candidate need be strictly an architectural student.

8. We reserve the right of arranging the drawings for publication in any manner we deem necessary.

9. A critical notice of the designs sent in of each series will be given in an early issue following the receipt of the drawings.

FIRST LIST OF SUBJECTS.

A.—Local Board Offices for a country village in a stone district. Site to be an isolated one facing west, with a road frontage on front and right-hand only. Accommodation to comprise office for surveyor, with drawing office for one clerk. A pair of rooms for the clerk to the local board, one being his public office for inquiries. A rate collector's office and a board-room for ten members, who will sit at a horseshoe-table. W.c.'s and lavatory to be provided, and a caretaker's residence, consisting of living-room, scullery, pantry, w.c., and two bedrooms. The size of the rooms is left to competitors. The board-room to be on the first floor, with the rooms of the clerk to the board. A strong room, 6ft. square, for his use to be provided. Caretaker's door to be at the rear of the premises, and his rooms may be on two floors at the back. Scale 8ft. to the inch. View, two elevations, section, and plan. Plans may be drawn to 16ft. to the inch, if necessary.

THE INNS OF COURT AND CHANCERY.*

ONE always wonders, much as Wesley did, why the devil had the best tunes, how the lawyers ever came to obtain possession of the pleasant nooks of London in which the Inns of Court are situate. Dear to the artist and antiquary, in spite of the vandalisms of the various benchers who bear away over them, one hopes sometimes that better masters may some day appreciate the Temple, Lincoln's Inn, and Gray's Inn as they deserve to be appreciated. Meanwhile the best consolation may be found in the possession of such a magnificently-illustrated record of their beauties as that before us. Mr. Loftie's work has been conscientiously performed throughout. He is rather merciless in some of his conclusions—is it so certain, for instance, that the famous catalpa tree in Gray's Inn Gardens was *not* planted by Bacon? or so utterly beyond all doubt that Mr. Douthwaite, the librarian and historian of Gray's Inn, is so at sea as Mr. Loftie thinks in his ancient history of his Inn? Anyhow, Mr. Loftie himself is always ready with chapter and verse for his own facts, and his style is as attractive as his story is veracious. He gives in turn a lucid history of each of the Inns and an intelligent running commentary on their respective beauties, and their associations with the famous men who have dwelt in them. Mr. Herbert Raiton's illustrations are perfect. He gives us twelve plates, ten of which are by himself, one by Mr. A. E. Pearce, and one by Mr. E. Stamp, and forty-five vignettes, mostly his own, but a few by the other artists named. The volume is sumptuously printed and well bound, and in every way a credit to the publishers.

* "The Inns of Court and Chancery." By W. J. LOFTIE, B.A., F.R.S.A. With many illustrations by HERBERT RAITON. (London: Seeley and Co., Limited.)

PETROUS TILES.

WE have had brought to our notice some very hard and extremely well-made tiles, manufactured by Messrs. Carter and Co., at their Encaustic Tile Works, Poole, Dorset, to which we desire to call the attention of architects, builders, and others. These "Petrus" tiles, as their name implies, are very stone-like in their texture, but much harder than any stone could possibly be. We have on our desk samples of five different colours—black, chocolate, red, grey, and buff. For finish and nice harmonious colour, they are not to be surpassed. These tiles are 3in. square; but they can be had in larger sizes 6in. by 6in., 4½in. by 4½in., and being so true in size and shape, are well suited to pavements of churches, public and private buildings, conservatories, lobbies, and other purposes where accurate fitting is required. For these purposes Messrs. Carter and Co. make diagonal halves and border strips of various widths, so that patterns of many varieties can be made. The colours are particularly quiet and artistic, and just those which architects prefer. The price of these tiles is only 3s. 6d. per square yard. We have seen other examples of the ornamental tiles made by this firm, and can recommend them to the profession. Messrs. Carter and Co. have successfully kept pace with the demand for artistic tile work, and their mosaic, mural tile work, faience, majolica dados, fireplaces, and other decorative applications are now well known for their quality and durability, and for the superiority they have over the manufacture of goods of this class, which appeal to a taste for bizarre and bright colours.

OBITUARY.

THE death is announced at the early age of thirty-two of Mr. Paul Peel, a distinguished Canadian artist, and a pupil of Gérôme. Mr. Peel was born at London, Ontario, where his father is a marble cutter and his sister a sculptor. His training began with three years at the Pennsylvania Academy of Fine Arts, was continued at the Royal Academy, and ended with five years in Paris. He had since resided at the French capital, with occasional visits to Canada, and had already obtained recognition in both countries. He leaves a widow and one son.

Mr. James Waterston, builder, of Morpeth, died on the 25th ult., after a long illness. Mr. Waterston was born in Edinburgh, where his father, who was a Morpeth man, was working as a mason in the building of the New Town. The deceased moved to Morpeth, and, following his father's trade, served his apprenticeship in the building of Meldon Hall. When he had served his time, he entered into partnership with his brother George, and these two acted for many years as the heads of the firm of Waterston Brothers. They were the builders of Cramlington, Otterburn, Longhirst, and many other Northumbrian churches, and they carried out the restoration in not a few notable churches, amongst them being that of St. Mary Magdalene, Mitford. Mr. Waterston was 70 years of age, and was widely known and respected among those of his trade.

The death of Mr. Robert Gray, builder and contractor, Berwick-on-Tweed, took place early on Friday morning. Mr. Gray, who was about 58 years of age, carried on a large business in Berwick and neighbourhood. At the time of his death he was engaged in the erection of houses on the ramparts as quarters for married soldiers under a contract with the War Office. A year ago Mr. Gray was elected a member of the town council as one of the representatives of the Middle Ward. He leaves a widow and family.

A SANITARY CRUSADE THROUGH THE EAST AND AUSTRALIA.*

MR. ROBERT BOYLE has reprinted the articles which recently appeared in our issues of September 2, 9, and 16, in a sumptuously-embellished little volume, and has added several illustrations. Thus, on the front of the cover we have a view of the Temple at Shway Dagon Pagoda, Rangoon; as the frontispiece, the grand entrance to the same; on the title-page the Royal Palace at Honolulu, and further on a group of leper beggars; the great

* Robert Boyle and Son, 64, Holborn Viaduct, and Glasgow.

recumbent figure of Buddha at Pegu; a curiously-balanced rock at Kut-te-yo, Burmah; the King of Siam's palace at Bangkok; a head-hunter, the Municipal Buildings and Centennial Hall at Sydney, the Houses of Parliament at Melbourne, and a ghastly but faithful representation of one of the "cannibal feasts" in the South Sea Islands. It is really wonderful how Mr. Boyle, whose thoughts while on foreign travel must of course be first occupied with his own large business, can find time to gather together the information he does; but the busy man is always the acute observer, and certainly Mr. Boyle seems never to have neglected an opportunity. Every reader who perused the articles in our pages will be glad to have them in this complete and dainty form.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—The session opened on the 1st inst., at which the president, Mr. W. Hale, F.R.I.B.A., delivered the annual presidential address. Mr. Hale congratulated the members upon the steadily increasing members, and on the improved position of the association, and expressed the hope that its work would, as it became more widely known, induce the members of the profession to give cordial support. Mr. Hale also said that though it had been found impossible for the association to do more this session than carry on the classes of design and construction, it was the wish of the council to see other special classes started in future sessions as soon as the number of students able to attend them justified their institution.

CHIPS.

The memorial to the late Mr. Edwin Waugh, the "Lancashire Burns," has just been completed, and has been erected on his grave in St. Paul's churchyard, Kersal Moor, Lancashire. The memorial takes the form of a Runic cross, standing on a die and plinth, and from the latter a ledger-shaped stone projects, covering the whole of the grave. The total height of the cross is about 10ft. The front of the cross is ornamented in high relief, and the whole is executed in grey Scotch granite. The front panel of the die bears the following inscription:—"Edwin Waugh. Born 29th January, 1817. Died 30th April, 1890." The work has been designed and executed by Messrs. J. and H. Patteson, of Oxford-street, Manchester.

As a memorial to the late Rev. Edward Thring, head master of Uppingham School, it was decided that the school chapel should be enlarged, and that a statue of the late head master should be placed therein. The extension of the chapel by the addition of a galilee was intrusted to Mr. A. E. Street, son of the architect of the chapel; the statue to Mr. T. Brock, R.A. The galilee, which was illustrated in the BUILDING NEWS for June 13, 1890, was completed and opened in September, 1890, Messrs. Parnell and Son, of Rugby, being the builders. On Tuesday last the statue was unveiled. It was exhibited at the Academy this year, and represents Mr. Thring seated, with a book in his right hand. It has been placed in the west end of the chapel.

The Morpeth town council considered last week the scheme drawn up by a committee appointed for the purpose of advising on the proposed working men's dwellings. They recommended that 30 houses be built on the West Greens, at an average total cost of £125 each house, or a total cost of £1,875, including everything. The committee recommended that they be let on such terms that they would at the end of 20 years become the absolute property of the tenants. The proposals were adopted.

New banking premises at Wiveliscombe were opened last week. The front is of Ham Hill stone. Mr. G. M. Silley, of London, was the architect, and Mr. Poole, of Ilminster, the builder.

The Princess Christian laid at West Brighton on Saturday the memorial stone of a new Police Convalescent Home in Bertram-road. Mr. Gibbins, of Brighton, is the architect of the building, which will cost £6,000.

A special meeting of the Manchester city council was held on Friday to consider the report of the consultative committee respecting the affairs of the Ship Canal Company. The report, which recommended that Parliamentary powers should be obtained for raising a further loan of two millions, was passed unanimously. On the same day the town council of Salford adopted a resolution in favour of lending £1,000,000 to the Manchester Ship Canal Company, if satisfactory conditions can be arranged.

CONTENTS.

The London County Council as Builders	621
The Southwark Baths and Washhouses Competition	621
Royal Society of British Artists	622
Institute of Painters in Oil-Colours	622
Stability of Walls on Soils.—VIII.	623
Montauk Club-House, Brooklyn, New York	625
Prices.—I.	626
Robert Boyle and Son, Limited	627
Building News Designing Club	627
The Inns of Court and Chancery	628
Petrous Tiles	628
Obituary	628
A Sanitary Crusade through the East and Australia	628
The Building News Directory	XIII.
Our Illustrations	629
Competitions	629
Wayside Notes	648
Building Intelligence	648
The "Rendu" of Architectural Drawings.—II.	649
Books Received	649
Correspondence	652
Intercommunication	652
Legal	653
Legal Intelligence	653
Water Supply and Sanitary Matters	653
Our Office Table	655
Meetings for the Ensuing Week	655
Trade News	656
Tenders	656

ILLUSTRATIONS.

THE MARLOW CLUB, GREAT MARLOW.—AUTOGRAPH DRAWINGS BY INIGO JONES, FROM THE DUKE OF DEVONSHIRE'S COLLECTION.—OXFORD CATHEDRAL.—SCHOOLS AT HOVE.—"SUNNY BANK," MAPPERLEY PARK, NOTTINGHAM.—MONTAUK CLUB HOUSE, BROOKLYN.—IMPROVED INDUSTRIAL DWELLINGS, GROSVENOR ESTATE, W.

Our Illustrations.

THE MARLOW CLUB, GREAT MARLOW, BUCKS.

THE Marlow Club building meets the requirements of a suitable club-house for the pleasure-seekers and lovers of sport who now so much appreciate the upper reaches of the river Thames. Those who know Great Marlow can realise the fine position against the existing suspension bridge. The principal floor, approached from the road and from the river bank, contains dining-room, reception-room, reading-room, writing-room, billiard-room, smoking-room, office, &c. The upper floors contain sleeping accommodation for nearly 100 members. The lower floor contains, at the back, the kitchen and usual domestic offices, and in the front a boat-house. The architect is Mr. Alfred Burr, F.R.I.B.A., of 85, Gower-street, W.C.

DRAWINGS BY INIGO JONES.

THE Duke of Devonshire has kindly lent us several of the original studies belonging to his famous collection of Inigo Jones's drawings, now at Chatsworth, and in the first instance brought together by the architect Lord Burlington, aided by Kent the architect. A few months ago a large number of these designs and drawings, on being removed from Chiswick House, now let to Dr. Tuke as an asylum, were exhibited in the galleries of the Royal Institute of British Architects, thus directing public attention to the subject, which cannot fail to be of interest to architects, particularly those who value their calling as an art. We gave the original perspective views of Inigo Jones's design for the great Palace at Westminster, showing the river and Whitehall fronts, in the BUILDING NEWS for December 19, 1884, and our illustrations were reproduced from the original drawings, which were lent us for the purpose by the kindness of H.M. the Queen from the Windsor collection. We likewise gave facsimiles of some designs by Inigo Jones for a series of capitals in our issue for January 30, 1885, and to-day we print a double-page plate of some more studies of the same character; but no two are exactly alike. Jones won the credit of being the first to introduce the Palladian style, though his earlier efforts, before he became Royal Surveyor, were in the direction of the Gothic manner then in vogue. None of his drawings of this earlier period of his career now exist seemingly, for, being unknown and comparatively obscure, no value was set upon his studies. Many of his drawings later in life were devoted to wild and fanciful conceptions for the scenery of Court plays at the time Jones held the appointment of Master of the Court Revels. They show, at any

rate, the brilliant imagination of Jones, and in the actual construction of the scenery he must have exercised considerable ingenuity. The talent for variety and freedom from the restrictions of Classical models evinced by these theatrical drawings is conspicuous also in the sketches for composite caps, which we have chosen for illustration to-day. They are all refined, and none are coarse or vulgar nor commonplace, and must be taken as an honest attempt on the part of a master hand to get away from the limits of past examples, though none can deny the purer beauty of the Grecian types, so dear to the purist. Such purity is out of place in the multifarious needs of much modern building.

CHRIST CHURCH CATHEDRAL, OXFORD.

THE new altar-piece in Oxford Cathedral, which we illustrate to-day, was erected a few years ago by Mr. G. F. Bodley, A.R.A., in red Dumfries stone, with dull-polished Rosso-Antico crucifix and statues in the niches. The side hangings are in green velvet embroidered with blue and gold thread, and are charming in tone and colour. The frontal hanging is in harmony with the rest of the work, and was carried out by the daughters of Dean Liddell. On the altar, which is of inlaid cedar, are two magnificent altar books mounted in silver gilt, very richly designed, and dated 1638. The candlesticks and silver alms-dish are about 20 years later in date, and are particularly good specimens of metalwork. The windows are by Mr. Burne-Jones, A.R.A. The views which we give show the choir as a whole and the sanctuary more in detail. We are indebted to Mr. Court Cole, of Folley Bridge, Oxford, for the beautiful photographs herewith reproduced. We gave a sketch of Cardinal Wolsey's fan-vaulting over the choir by Mr. Phené Spiers, F.S.A., in our issue for Aug. 29, 1890.

ROMAN CATHOLIC SCHOOL, HOVE.

THIS building, with the school-house attached, has recently been erected. It is built of stock bricks, the outer walls, being cavity walls, faced with red Cranleigh facings, and the roof covered with red Cranleigh tiles, the schoolrooms (65ft. by 25ft.), as well as the classrooms, being floored with Duffy's yellow deal wood-block flooring. The building was erected by Messrs. Parsons and Sons, of Hove, under the supervision and from the designs of Messrs. Lainson and Son, architects, of Brighton.

"SUNNYBANK," MAPPERLEY PARK, NOTTINGHAM.

THE illustration of this residence shows the actual background of trees, amongst which it is so beautifully and picturesquely situated. The house has been planned and carried out with great care, and is the private residence of Mr. Charles Hill, of Nottingham, the architect being Mr. Arthur W. Brewill, of Angel-row, Nottingham.

MONTAUK CLUB-HOUSE, BROOKLYN, N.Y.

(SEE description and further illustration on page 625.)

NEW INDUSTRIAL DWELLINGS, GILBERT-STREET, OXFORD-STREET.

ON Tuesday the Duke of Westminster opened two new blocks of dwellings for the working classes in Gilbert-street, Oxford-street. The buildings are the last of nine blocks of dwellings erected by the Improved Industrial Dwellings Company during the past six years on that part of the Duke's estate which lies between Grosvenor-square and Brook-street on the south, and Oxford-street on the north, the whole occupying an area, exclusive of streets, of nearly two acres. These buildings contain accommodation for 332 families, which, with the 38 families in Clarendon Building, Balderton-street—erected in 1872—represent a total of nearly 2,000 persons of the working classes resident on this part of the Grosvenor Estate, or about 700 more than formerly occupied rooms in the old houses. The total cost will be upwards of £80,000. Each dwelling contains separate domestic conveniences, and wash-houses are provided on the roofs. The company has, during the past 23 years, erected on other parts of the Grosvenor Estate 409 separate dwellings for about 2,000 persons. They possess, in all, 48 estates in various parts of the Metropolis, chiefly in the central and eastern districts, 47 of which are now completed for occupation by about 28,000 persons of the working classes; and buildings to accommodate 42 additional families are being erected in West

Kensington. The total expenditure on these estates will amount to about £1,103,000. The new blocks opened on Tuesday are lettered E E on our illustration, and have been called Moore Buildings as a compliment to the active and courteous secretary of the Company, to whose constant labour no small part of the success of the Company is due.

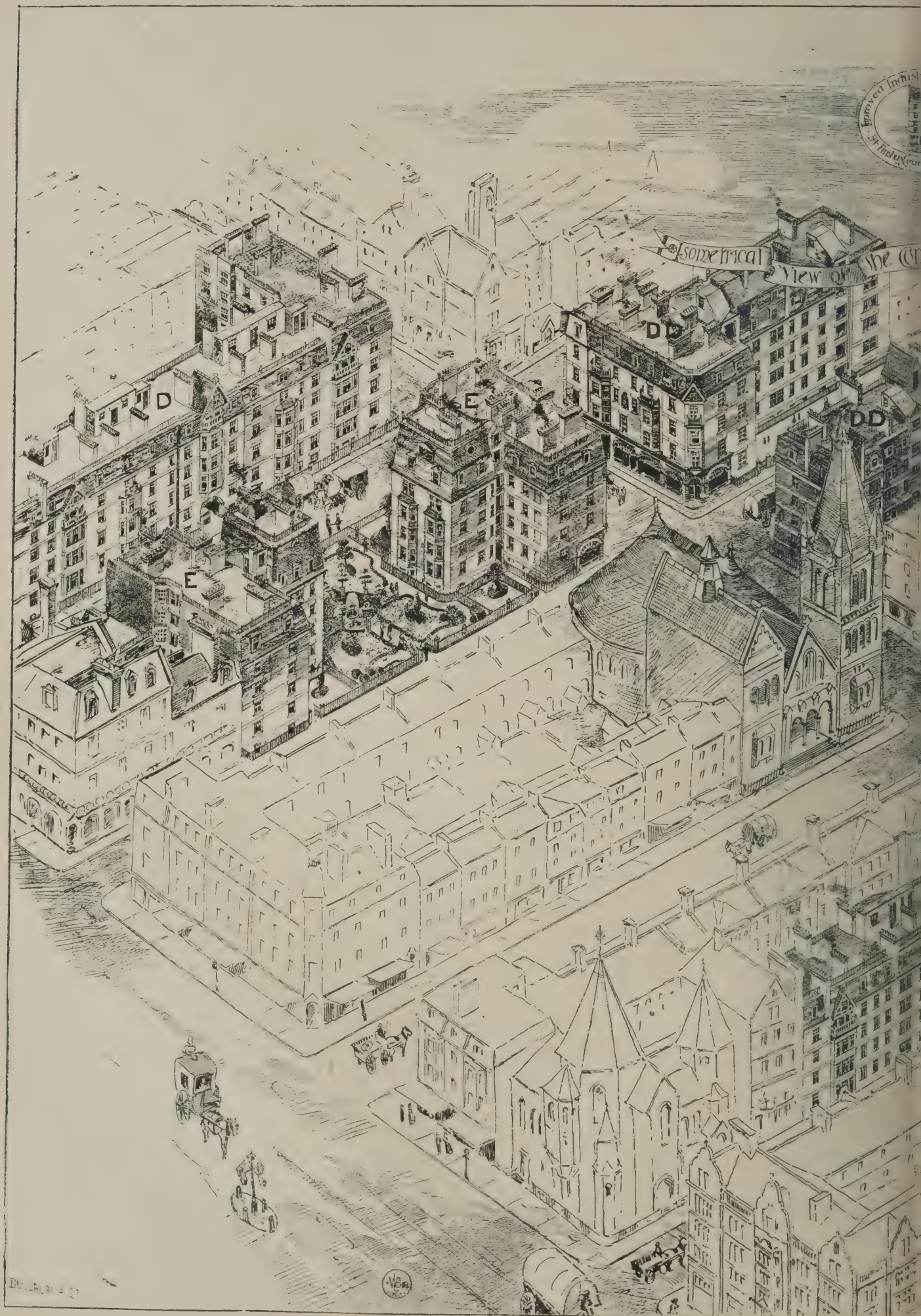
COMPETITIONS.

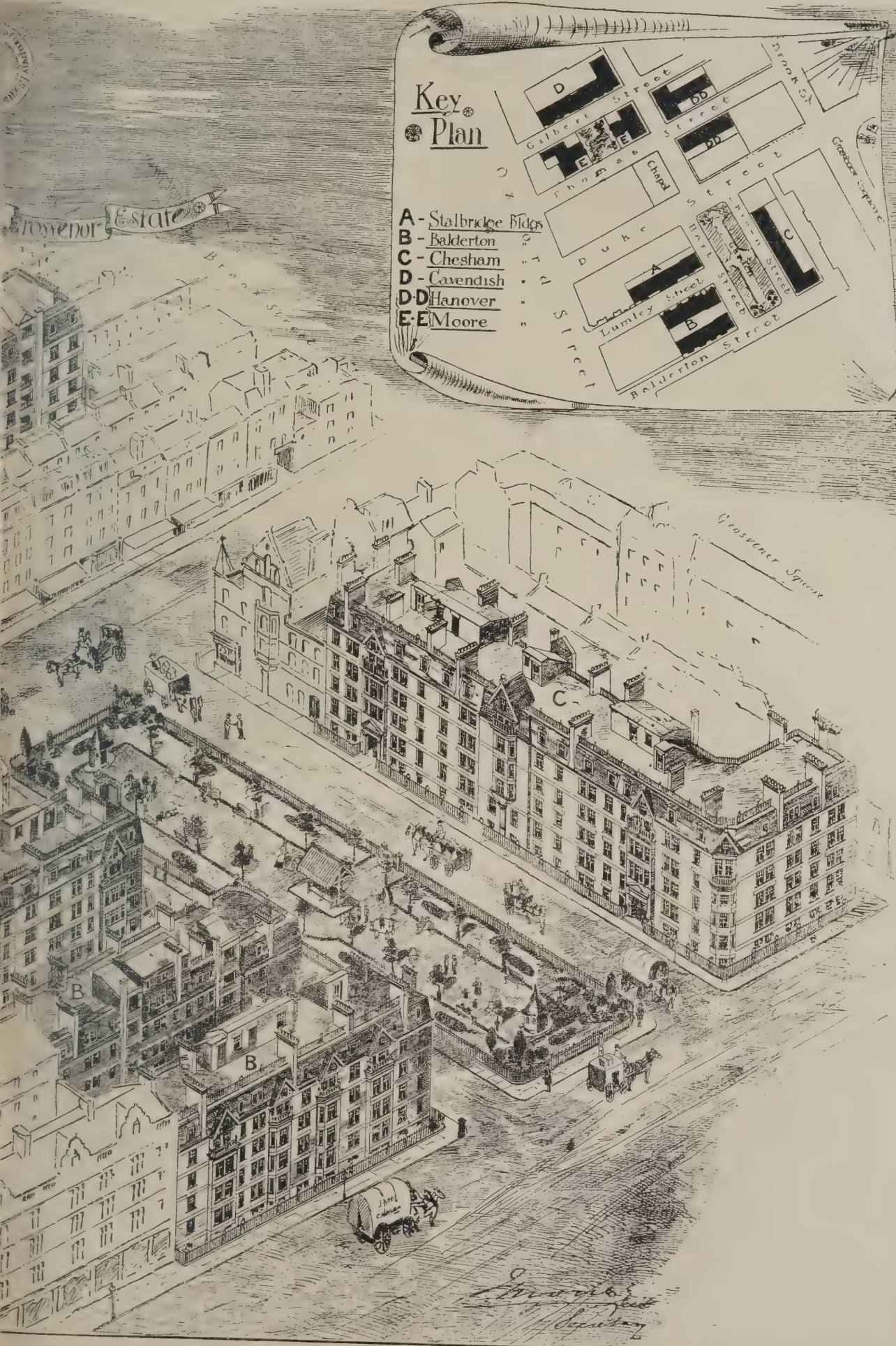
MAIDSTONE.—The town council have held a special meeting to decide the award for plans for the proposed technical institute. The competition was limited to architects practising in Maidstone, and only two plans were sent in, the mottoes being "South Kensington" and "Efficiency." The cost was limited to £6,500, with an additional £700 as provision for fittings, heating, and lighting. The institute will be placed near the existing museum buildings. The committee recommended that the design by "South Kensington" should be adopted, and this was agreed to. The author is Mr. Albert W. Smith, F.R.I.B.A., of the firm of Ruck, Son, and Smith, of Maidstone. Mr. H. Bensted sent in the design under motto "Efficiency."

NEWCASTLE-ON-TYNE.—The question of improving the accommodation and appearance of the Newcastle Town-hall was again discussed by the city council last week, when Mr. Baxter Ellis moved that the town-hall committee be authorised to expend not exceeding £350 in prizes for competitive plans by Newcastle architects showing the best method of improving the present town-hall buildings for the purposes of a town-hall and concert-room to meet the requirements of the city. Mr. Ellis declared that the concert-room was a disgrace to the city, and not fit to take ladies into, and that the exits and entrances were inadequate. A long discussion followed, and it was decided to reduce the amount to be offered in premiums from £350 to £100. This was carried, and a committee were advised to instruct Mr. Laws, the city engineer, to prepare a plan.

ST. PANCRAS.—The St. Pancras Vestry received on Wednesday deputations of ratepayers for and against the proposal to erect municipal buildings on a site already secured at the junction of Great College-street and King's-road with Pancras-road, opposite the Vestry Hall. The land was purchased at a cost of £6,500, and the estimated expense of erecting buildings is between £30,000 and £40,000. A petition signed by 590 ratepayers, including Messrs. Maple and other large manufacturers and shopkeepers, and representing a rateable value of £250,000, urged the erection of the proposed buildings in a more central, convenient, and commanding site than that suggested—namely, on land "somewhere between the Cobden statue and the Mother Red Cap Tavern," High-street, Camden Town. Mr. J. W. Dixon moved the adoption of instructions to architects with regard to the construction of municipal buildings on the Pancras-road site, and that architects be invited by advertisement to send in competitive designs for the new buildings, the premiums being 100, 50, and 25 guineas for the first, second, and third designs respectively. Mr. Bridgman proposed an amendment instructing the General Purposes Committee to "ascertain and report to the Vestry what sites there are in the locality between the Regent's Canal on the north and Euston-road on the south suitable for the erection of municipal buildings, with approximate estimates of the cost of the same." The original motion was, on a division, carried by 53 to 30; and an additional instruction was adopted requiring the competing architects to provide in their designs a hall at least as large as the hall in which the Vestry now met and let occasionally for public meetings, &c.

In connection with the reopening of St. Paul's Church, Knightsbridge, a new stained-glass window in memory of the Rev. the Hon. Robert Liddell, the late vicar, was dedicated on Sunday. The chancel has been extended by 15ft., and is intended to receive coloured decoration. An oak screen, carved in 15th-century style, separates the chancel from the nave. The screen was designed by Mr. G. F. Bodley, A.R.A., and is divided into five compartments. On the screen is a cross flanked by the figures of the Virgin and St. John. These figures were carved in Ober Ammergau. There is a new stone reredos. The Liddell memorial window represents the Tree of Jesse.

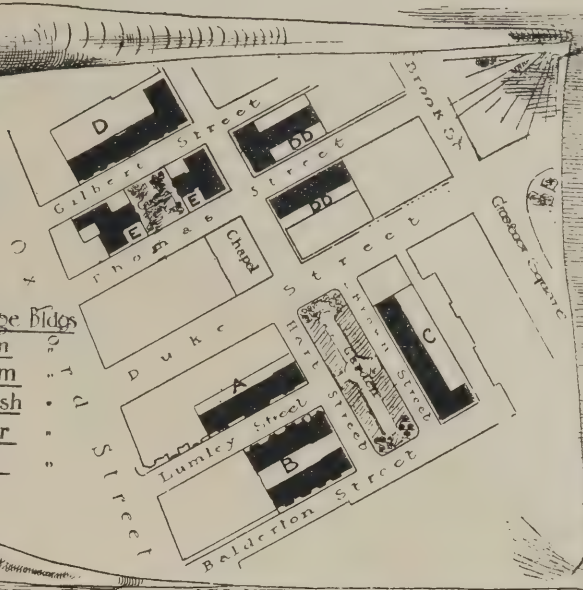




Grosvenor Estate

Key
Plan

- A - Stalbridge Bldgs
- B - Balderton
- C - Chesham
- D - Cavendish
- DD - Hanover
- E - E Moore



W. G. Smith
London

WAYSIDE NOTES.

THE "stones of Battersea" are in their way as renowned as the "Stones of Venice." Legends galore would seem to be gathering about them. Only the other day a correspondent of the *Standard* announced that these forlorn architectural fragments—that form, or formed some years ago, when I visited Battersea Park, a rare playground for *gamins* innumerable—"originally constituted the façade, or portico, of Northumberland House, Charing Cross." This is truly a startling announcement enough, seeing that most of us long laboured under the belief that the stones in question once formed part and parcel of the colonnade and gateway of old Burlington House.

In the face of such a statement, it is not surprising that another correspondent—"C. W."—hastens to prevent the establishment of a false tradition, and to point out that these "stones of Battersea" were advertised for sale in the year 1858, by the Government of the day, as "the admired stone erection of the colonnade and gateway at Burlington House," the said colonnade and gateway being designed in confessed imitation of the Palace of Count Vieriati, at Vicenza, and was pronounced by Sir William Chambers to be the finest thing of its kind in Europe. "C. W." says that in their present resting place the stones have become the subject of many conflicting traditions, "in the face of which," he moralises, with much pertinence, "it seems rather hard to flout the occasional differences of opinion entertained by students of the past with regard to the origin of Stonehenge."

These stones come into prominence with quite an astronomical periodicity. Now, someone complains of their decay and neglect; anon suggestions are made as to the reconstruction of the gateway and colonnade. Not so fortunate as the old stones of Temple Bar, they have been going to rack and ruin for long years, and from what I remember of their condition when I visited them, they have become so worn by weather, and so injured by the playful gambols of the *gamins* aforesaid, that they would be little use for the purposes of any reconstruction scheme. Were the stones in good condition, one would certainly advocate a restoration of the old gateway and colonnade at some park entrance or other not unsuitable position.

I have heard of "cut-and-come-again" and "cut-and-run," but never before of "cut-and-cover." If, however, I understand rightly the meaning of the expression in tunnel works, as used by the contractors for the Blackwall Tunnel, then the relinquishing of the method of working under compressed air will be more hazardous for the workmen in the drift. The compressed-air process practically insures safety from sudden "drownings-out." It is quite to be understood that the majority of workmen would be only too willing to abandon methods of working entailing more or less hindrances to speedy and easy operations, and doubtless working in compressed air is not so comfortable as labouring in an atmosphere at nature's own pressure. But the County Council, being anxious about men's wages, should, to be consistent, take even more thought for the safety of their lives, and, therefore, before allowing changes in the programme as set forth in the specification for the tunnel works, they should inquire into this matter. The referring back of the whole question on Tuesday last was, therefore, a judicious step, and will allow the Bridges Committee to proceed with due caution in permitting a change in the method of working.

Tuesday's meeting of the County Council was marked by a more than ordinary amount of attention to practical building matters. Subsequently to the consideration of the Blackwall Tunnel, the contract for the Barking-road Bridge was taken in hand, and the tender of the Thames Iron Works and Shipbuilding Company, Limited, accepted at £54,353, on the condition that the company pay the trade-union rate of wages. The Building Act Committee brought forward the matter of street hoardings, and recommended a low limit of height to be placed thereon—a recommendation with which we shall most of us agree. A new fire-brigade station being proposed for Queen's-road, New Cross, naturally

enough, a number of councillors thought this an excellent opportunity for the Council to commence building operations on its own account. Fortunately, a large majority saw the folly of deferring the erection of the new station until arrangements could be made for such a system of building, and sanctioned immediate continuance of the work of getting in tenders. Compared with the average meeting of the Council, the last one was remarkable for its despatch of business.

When speaking of the restoration of Rochester Cathedral last week, I should have said that Mr. Pearson would shortly be continuing the works at the cathedral, for works of restoration have now been going on there for a considerable time under Mr. Pearson's direction. I am told that some beautiful Norman diapering has been discovered and rebuilt into position, and that it is "worth anyone's while to make a special visit to see it."

I read of the new church of St. Philip, erected at the back of the London Hospital, and consecrated some few days back by the Bishop of Wakefield, that "no ornamentation appears on the exterior of the building." This promises well for the interior. Too often we find work lavished externally and stinted internally, whereas a building should so far bear analogy to a man that its great worth should be reserved and inward; and as a rugged exterior well covers a good heart, so plain and massive external façades are best suited to delicate and refined internal composition.

A correspondent writes:—"The past-masters at throwing mud are now flinging it at each other, and the organ of the R.I.B.A. howls and whines 'accordingly' at getting a touch of its own quality. Fancy 'deliberate misrepresentation' against its pets! Such was only allowable against the common enemy, and so the pot calls the kettle black, and the Education and Registration Bill advances a stage."

What a deal of cant continues with regard to the "craftsman"! It is time a few such took up the gauntlet, and said—what they could often say with truth—"Give us properly-trained bred-and-born architects to supervise, and we will turn out good architecture." There is a vast deal about this poor, unfortunate "craftsman" in the great work. He appears to be the root of all evil—such, at least, is the impression many will gather from a perusal of several of the essays.

Do a little more for the "craftsman," and he will then perhaps take more interest in the work he does for you. Spend a little of the 5 per cent. in charitable works on behalf of him and his kind; give a dinner or supper at the completion of every work of any importance, and let every man on the building, from hodman upwards, sit down to the fare, and do not think that your fine reputation and delicate architectural feelings will suffer by reason of yourself sitting at the table. Take an interest first in the workman and then in his work, and it is not in human nature to long remain indifferent to acts of kindness. Poor Sedding started this craftsman mania; but his arguments were founded on conviction and true feeling, while the cry of "Improve the craftsman!" has since developed into a sensational party slogan. Let us rather look to the improvement of ourselves; if need be, let more time be spent in demonstrating our ideas to workmen. It has always seemed to me that it is not the worker who is at fault, but the supervisor—the architect. Instead of allowing a carver or other worker to put some of his own ideas into a piece of work, he is bound down to every line and curve of a drawing or model. As a consequence, the executed work generally presents a hard, lifeless appearance. In the old days, to which those suffering from craftsmanphobia are so fond of referring, we have strong reasons for believing that, as a rule, the carver carved to his own fancy; and hence, feeling the joy of independent work and free and untrammelled thought, he, for very love of the labour, would throw every energy into the work in hand. Nowadays the architect has a grasping greediness for taking the credit for every square inch of design in the building.

GOTH.

Building Intelligence.

ABERDEEN.—The plan of building extension just adopted by the University Court is an important one, and is estimated to cost about £90,000. It comprises the extension and completion of the quadrangle at Marischal College by the extension of the north wing to accommodate the departments of chemistry, pathology, surgery, medicine, and law; the erection of a new front block facing Broad-street accommodating the administrative offices, University court-room, faculty room, committee room, secretaries' rooms, two sacristy houses, and lady students' rooms, also the departments of botany and agriculture; and the erection of a new graduation hall and students' rooms (the gift of Mr. Charles Mitchell, of Newcastle) in the rear of the present buildings, and connected with the existing hall and library and museum; likewise of the rearrangement and addition to the department of anatomy. The plan also provides for the erection at King's College of a new natural philosophy department and for students' rooms, including accommodation for ladies. The external appearance of the Marischal College buildings will be in character with the original design, the only change on the plan being that the hall is placed at the back in connection with the existing halls instead of in the front block, which is now to be devoted to administrative offices, botany, and agriculture. The architect is Mr. Mackenzie, of Messrs. Matthews and Mackenzie, Aberdeen.

CRAWSHAWBOOTH.—The new church of St. John the Evangelist at Crawshawbooth, near Goodshaw, in the Rosendale Valley, was consecrated by the Bishop of Manchester last week. It is in the Late Decorated style, and is built of local stone, with Yorkshire stone dressings. A tower 23ft. square, and measuring 95ft. from the ground to the top of the parapet, and having pinnacles running 27ft. above the parapet, thus giving a total height of 122ft., is now the most striking landmark in the locality. Internally the church consists of a nave, 80ft. by 24ft., of five bays, and there is a chancel, with a roof of polygonal form, some 50ft. by 24ft. The east window of the chancel has six lights, and the west window five lights. Accommodation is provided for about 600 worshippers, and the total cost of the building and furnishing is put at about £12,000. The lower part of the tower forms a commodious organ-chamber, and opens into the church by two lofty moulded and panelled arches, 25ft. high. A north chapel or organ-chamber of one bay, carried up to the full height of the nave, adjoins the east side of the tower. The church is lined internally with red Rainhill stone, the chancel being of face-dressed ashlar. The passages are flagged, and the floor under the seats is laid with wood blocks. The chancel pavement is of tiles and stones.

SOUTHPORT.—The foundation-stone of the new infirmary was laid on Thursday in last week. The site is five acres in extent, and is bounded on three sides by streets, the main frontage extending 121 yards. The width of the building will be 243ft. The style is a Free treatment of Flemish, the external walls being of red stock bricks, relieved with Longridge stone dressings and a small quantity of terracotta, with roofs of Westmoreland slates and red ridgings. The central portion of the main frontage will be two stories in height, while the ends and corridors will be only one. In the centre of the front block there will be an octagonal brick and stone clock tower, surmounted by a wood and lead lantern, rising to a height of 76ft. One of the main features will be the central arrangement of the out-patients' department, which will easily accommodate 70 persons. From the centre of the main corridor, running towards the back of the building, is a corridor 9ft. wide, leading to the accident ward and the operating-room. The isolation ward block is a distinct hospital in itself, having ward nurses' room, two wards for two beds each, baths, lavatories, and linen-rooms. Gardens surround the whole buildings, those to the front being laid out in a circular form, with a fountain in the centre. Mr. C. Sydney Ingram, of Manchester and Southport, is the architect; the contracts for building are not yet let.

The Peel Mill No. 2 at Bury, Lancs, will be formally opened to-morrow (Saturday). Messrs. Stott and Sons, of Oldham, were the architects.

THE "RENDU" OF ARCHITECTURAL DRAWINGS.—II.*

IN order to effectively render or colour a geometrical drawing, all the effects explained in the last article should be taken into account. The direct, the reflected rays, effects of distance, contrast and irradiation should carefully be observed whilst colouring; after a while the eye and hand will combine in naturally producing the desired result.

The colour should be used sparingly and with good taste, and vulgar effects should be avoided. The harmony of light and shade and distance is obtained by means of the science of colouring, combined with method and artistic feeling. The shadows should be carefully put in, and the colours laid on in light flat or graduated washes, the effective touches artistically indicated. Often when clearness of effect is necessary only, the shadows may be indicated, and a simple wash of general colour put on, with a few touches of lighter or darker colour; the building will then appear to stand out from the paper with all the effect of light and shade.

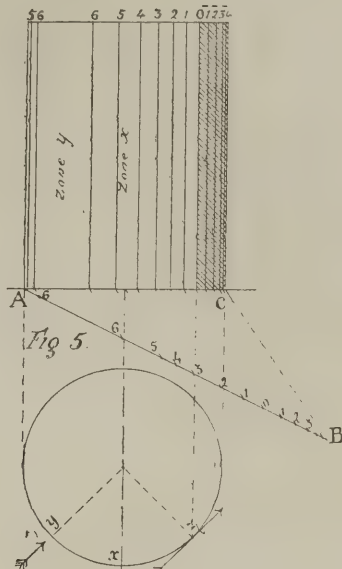
One of the most important things is the ability to well model in colour and shadow rounded surfaces, such as columns, towers, &c. This is not easy at first, the young beginner often spoiling his drawing and temper over the modelling of a rounded surface, and utterly failing to get the proper effect. This is because he does not understand the principle of shading, the exact points at which the direct light strikes the surface, and the points where colour or shadow is necessary.

Therefore, before proceeding to explain the tinting of an ordinary flat surface, we will consider the modelling of a rounded body, and the rules for obtaining the desired effect. In the last article we spoke of the effects of light and shade on polished and unpolished surfaces. As a rule, in architectural drawings we have to occupy ourselves only with unpolished surfaces, such as stone, wood, &c., in their natural state—that is so say, surfaces which reflect the light in a diffused state, as explained in the last article. In a circular body we have three principal effects of lighting to take into account. When a surface is well lighted, a certain proportion of the rays of light are absorbed, and a certain quantity reflected, and if the light is not too intense, and a fixed proportion of the rays are absorbed, the reflected rays will take the apparent colour of the object, which will itself appear tinted with its local or natural colour. If, however, the lighting becomes more intense, the reflected rays become charged with the superabundant white rays, the local colour disappears, and the tint appears lighter in colour, and almost white. But if, as in the third case, the amount of lighting is lessened, all the rays are absorbed, and the local colour assumes a darker tone, mingled with shadow.

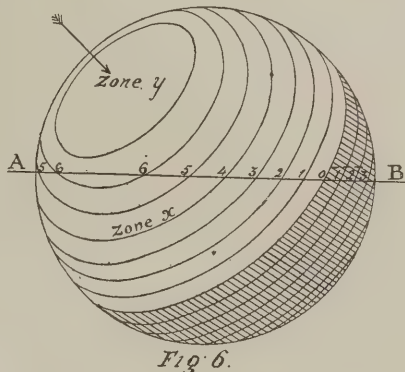
The rays of light coming at 45° strike the surface in full at y , Fig. 5, and at a tangent at z . The point y is therefore most brilliantly lighted, the point z almost in shadow, and the intermediate point x more or less lighted. This point x therefore being lighted moderately, and absorbing all the white rays, reflecting only the coloured rays, will appear in its natural or local colour; the point y brilliantly lighted, and sending back the white rays which are not absorbed, will appear lacking the local colour, and almost white; and the point z very little lighted, and absorbing all the rays of light, will appear with the local colour mixed with shadow. Between these three points the lighting is graduated, that from x to y gradually weakening in colour, and from x to z gradually deepening in colour, mixed with shadow.

Now, in order to determine the scale of tints necessary for modelling a rounded surface, we have first to find the scale of light and shade, by means of a perfectly-constituted surface, that of a sphere. We need not enter into the method of finding the lines of the sphere, Fig. 6. This sphere is intersected by seven planes, equidistant from each other, parallel to each other, and perpendicular to the direction of the rays of light. The surface is thus divided into a certain number of zones, 1, 2, 3, &c., and—1, 2, 3, &c., starting from the line o , which corresponds to the point z in Fig. 5. Of these zones the most important are x , y , and z . Zone z is that coming directly after the line o , separating the lighted portion from that in natural colour; x , that which, receiving the ray of light in a certain degree,

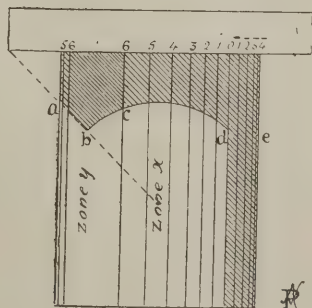
appears tinted in local colour; and zone y , the portion of the surface brilliantly lighted, and therefore light in tint. Thus if the sphere



were coloured red, the zone x would appear tinted with all the force of the red, the zone y almost white, mixed with a little red, and the zone z the local colour, mixed with a certain amount of shadow colour. The intervening zones connect these by means of graduated tones. We are therefore able, by means of this sphere, to establish a fixed scale of lines of tints for rounded surfaces. It is evident that if we wish to find



the lines of tints for modelling a vertical cylinder, such as a column, &c., of the same diameter as the sphere, by circumscribing the surface of this cylinder to the horizontal circumference of the sphere, and marking off the points from this circumference on the surface of the cylinder, we obtain the lines of tints for the cylinder. The line A B, Fig. 6, forms, therefore, a fixed scale of lines of tints.



In Fig. 5 we have a portion of a column, A C, of any given diameter; by means of the fixed scale A B and lines parallel to B C from the points 1, 2, 3, &c., we mark off the corresponding

points on the line A C, and raise the verticals therefrom. On looking at the plan we see that these points are correct; the line of natural shadow o is the projection of the tangent point z , the intermediate point x falls in the zone from 4 to 5, and the well-lighted point y in the zone 6 6.

In Fig. 7 we have the same cylinder capped by an abacus, and in natural shadow from d to e , in cast shadow a, b, c, d . We will follow the method for modelling the surface. The lines of tints should be marked very faintly in pencil in the lighted portion, more forcibly when under the cast shadow, and very firmly in the portion in natural shadow.

Let us first model the cylinder in Fig. 7 by means of a series of flat washes in Indian ink or sepia. We must mix a tint of a certain degree of intensity, say two-thirds, in the scale of white and black, and pass it over the whole portion in shadow. A little water is then added to the colour, and this lighter tint is passed over the zones 1 to —1, and over the whole portion in shadow to the left of —1. A still slightly lighter tint is then to be passed over the portion 2 to —2, and the whole portion in shadow to the left of —2; a still lighter tint from 3 to —3, &c., and so on, until six successive tints have been passed over the surface in light and shadow. The surface should now appear rounded, but the portion in cast shadow is not yet sufficiently modelled. A very dark tint should be passed over the whole zone 6 6 in shadow, a slightly lighter from 5 to 5, and so on, until six tints have been put on, stopping at tint o with a tint very slightly darker than the original tint put on at the commencement of colouring. The cylinder in shadow should now appear well modelled.

Naturally, the method of modelling with flat tints is long and tedious; but the student should practise this at first before attempting modelling by means of graduated tints of colour. Let us now model the same cylinder by this second process. The original dark tint is, as before, washed over the whole portion in shadow. The zone y , being well lighted, we have to leave nearly white, so with the brush full of water we wet the zone y ; then, quickly adding a little colour, we graduate the tint rapidly to the left, and again, before the zone y becomes dry, repeat the same process to the right, gradually adding more colour until the tint is brought at its brightest to the line o , and from this line graduated over the remaining portion, d, e , in natural shadow, softening the tone as the exterior line is approached. Then we cover the zones 6 and 5 with pure water, and adding gradually more and more shadow tint, reach the line o , and from thence to the exterior line, softening the tone. The modelling in colour and half-tints is now completed; it remains for us to finish the cast shadow a, b, c, d . We pass a wash of shadow tint slightly tinged with the colour of the object over the portion in cast shadow only, commencing at line o , and gradually darkening the shadow as we approach the zone 6 6, which should be the portion in deepest shadow.

The sphere may be modelled in a similar manner. With the brush full of water slightly tinged with the colour given to the sphere we cover the whole of the zone y (Fig. 6); then, gradually adding colour, we bring the wash to the zone x , when the tint should be at its brightest, and from this zone we bring the tint, without adding more colour, over the remaining surface. Then the whole of the surface in natural shadow must be covered with shadow tint. Again commencing with pure water at zone x , and gradually adding shadow tint, we cover the zones 5, 4, 3, 2, 1, and graduate the wash on the remaining zones in shadow.

The student should practise modelling to a large scale a number of spheres and cylinders. Of course, after a while, the scale of zones may be dispensed with, the eye becoming experienced in the right proportion to be given. He must, however, remember that the whole effect depends on the exactness of the positions of the principal zones x, y , and z , the points of brilliant lighting, local colour, and shadow.

ARTHUR VYE PARMINTER.

BOOKS RECEIVED.

Advanced Building Construction—a Manual for Students, by the Author of "Notes on Building Construction" (London: Longmans, Green, and Co.)—is a reduced edition of Part II. of "Notes on Building Construction" intended for students

in the second stage or advanced course of this study, held under the direction of the Science and Art Department. Certain portions of the "Notes" as first published are omitted as not required at this stage, and the resulting volume is smaller and more handy, illustrated by the same diagrams, and printed in clear type. As one of the Advanced Science Manuals published by Messrs. Longmans, Green, and Co., we can highly recommend it to all students of building construction. The subject of stresses on structures required by the syllabus is dealt with and illustrated by diagrams of beams differently loaded. The student will find how concentrated and uniformly distributed, or partially distributed, loads act, and the nature of stresses under varying loads and supports. Materials, including bricks, stone, limes and cement, timber, iron, and steel are succinctly treated, and the detailed information, as varieties and tests, are printed in smaller type following the arrangement in the Notes. We know of no better or more concise elementary statement of the properties of limes and cements, plasters, or timber. The chapters on the several branches of construction are well arranged and admirably illustrated, as in bond, arches, chimneys of brick. The sections treating on timber roofs and coverings comprise much useful information as to construction, slate, tile, and zinc laying. Wrought-iron girders, iron roofs, and fireproof floors are thoroughly explained and illustrated by details clearly drawn and figured, and in these respects the Manual is certainly superior to the treatment found in other elementary handbooks on construction.—MR. JOHN HOLLINGSHEAD tells in a well-illustrated shilling volume just to hand *The Story of Leicester Square* in a very readable and entertaining fashion. From the immense mass of trustworthy material available for collecting facts as to the history of the square during the past four or five centuries, Mr. Hollingshead has compiled a pleasant narrative in which figure such varied claimants to fame as Lawrence, Hogarth, and Reynolds; Peter the Great and George the First; Chippendale the cabinet maker, Dibdin, Edmund Kean and Ben Webster, E. T. Smith and the Farinis, Hunter, Bell, and Cruikshank. We have references to the Alhambra and Empire, and the many shows that have been held in or near the "square of squares." A chatty letter by Baron Grant tells us how that once famous financier came to purchase the freehold of the square, to transform the inclosure from a filthy wilderness into a blooming garden, and to present it to the Metropolitan Board of Works. Messrs. Simpkin, Marshall, Hamilton, and Kent are the publishers.—*The Ornamental Draughtsman and Designer*, by several practical draughtsmen and designers, arranged by Robert Scott Burn, editor of "Illustrated Drawing Book," the "Building and Machine Draughtsman," &c., with folding plates and illustrations (London: Ward, Lock, Bowden, and Co.), is a series of practical instructions illustrated by examples of freehand drawing in outline and from the round, of styles of ornament. Those handbooks, forming the "Practical Mechanic" series, are useful to all who wish to acquire the rudiments of technical knowledge, and the present volume follows on the lines of the "Building and Machine Draughtsman," "General Machinist," and other books of the series in the fulness of the illustrations and the explanatory remarks. The instructions given for drawing, rectilinear and curved lines, and ornament and on shading, will be found of service to all mechanics, artisans, and apprentices in the engineering and building trades, and the remarks on form and colour contain much useful advice to this class of students.—*The Grammar of Woodwork: A Graded System of Manual Training for Elementary, Secondary, and Technical Schools*. By WALTER E. DEGERDON, Head Instructor in Woodwork at the White-chapel Craft School (London: Macmillan and Co.)—This is a series of lessons on the elements of the use of woodworking tools, designed for the pupils of the above school, over which Mr. Degerdon is master, and it is thought they might be useful to a wider circle of students. The value of manual training as a part of a general education is admitted by all. The author's lessons are graduated by easy steps. The earlier lessons consist simply in using tools to true up, square, and make to a certain length, width, and thickness a piece of wood; then follow exercises in planing to given dimensions, chamfering, making prisms, cutting shoulders, sawing and boring with brace and bit; in chiselling, rebating,

inlaying, setting-out, mouldings, mortising, parquet-work, and other more complex operations. Plans and elevations and isometrical drawings illustrate each exercise, and these are clearly drawn to a scale of half an inch to the inch, or half full size. Each separate operation is explained under a separate heading, which is a great aid to the pupil, and there are 21 lessons in all. We should have preferred to see a few more constructional or practical problems introduced, such as framing and simple joiner's work; but this system is not recommended by Mr. Degerdon, whose exercises are simply intended to train the hand in the use of ordinary woodworking tools to the satisfaction of the eye already trained in drawing. Tulip wood is recommended as a clean and sound wood for the models. Real trade teaching is avoided in the system here recommended, and we think for elementary schools the principle is the right one. It would be injurious to those apprenticed to the trades to have to compete against young men who had only imperfectly learned the elements of carpentry and joinery, and therefore the attempt to teach trades has been generally objected to. We can cordially recommend Mr. Degerdon's exercises in woodwork.—*The Iron and Steel Maker*, by various practical writers, edited by F. JOYNSON, with plates and illustrations (London: Ward, Lock, Bowden, and Co.), is a useful compilation, containing detailed descriptions of the various processes for the conversion of iron ores into pig or cast iron, wrought iron, and steel, with illustrations of the furnaces and appliances. The student desirous of mastering the processes of ore conversion, of iron and steel manufacture, the great revolutions effected by the discoveries of Bessemer and Siemens in mild steel-making, and the "open hearth" process will find this book a good introduction. A sketch is given of the early history of iron manufacture, the system of making iron with coal as a fuel, the smelting of iron ore, the blast furnace, the different regions of the reduction of the ores in the furnace, its action, the chemical changes, the appliances and machinery puddling furnaces, cast iron. Steel, making is next discussed; the early methods are fully described, afterwards those methods which have commenced a new era in steel-making, that associated with the invention of Sir Henry Bessemer.—*Lectures on Sanitary Plumbing, &c.* (Manchester: John Heywood).—The Manchester Council of the National Registration of Plumbers are issuing a series of penny pamphlets containing lectures on "Sanitary Plumbing," by experts, which cannot fail to be of value to all plumbers and their employers. Amongst the lectures to hand is an introductory address by Mr. John Holden, F.R.I.B.A., the president of the Council, prefixed to a lecture on "Domestic Hot-Water Supply and Fittings," by Mr. Joseph Corbett, sanitary engineer, in which the principles of hot-water heating for houses are explained and illustrated by diagrams; "Reasons why Sanitary Authorities should Employ Qualified Plumbers as Sanitary Inspectors," by Mr. M. Ingram, Mem. San. Inst., vice-chairman; "Electricity in its Relation to Plumbing," by W. W. Haldane Gee, B.Sc., &c.; "Sewer Gas, and the Methods of Dealing with it," by J. Radcliffe, F.R.M.S.; "How to Elevate the Status of Plumbers," by John Allison, M.Inst.C.E., City Surveyor; "Domestic Cold-Water Fittings," by Mr. Joseph Corbett, sanitary engineer, &c. These short lectures contain many useful suggestions.—*Manual of Continuation Schools and Technical Instruction*.—By CHARLES HENRY WYATT, Clerk of the Manchester School Board, &c., Illustrated (Manchester: John Heywood). The volume will be found of service to authorities who are charged with the provision of continuation schools and those for technical instruction. Under the new Code of 1891 various branches of commercial and technical instruction call for the establishment of schools and classes in all parts of the country. For all promoters of Elementary Evening Schools and technical schools and classes and higher grade schools this work will be of practical value, and the plans given of the Higher Grade School are useful. They are arranged on an economical principle, with separate floors for boys and girls. Much useful and statistical information will be found in Mr. Wyatt's book, which should be in the hands of every schoolmaster and teacher.—*Lightning Conductors and Lightning Guards: a Treatise on the Protection of Buildings, &c., from Damage*, by OLIVER J. LODGE, D.Sc., F.R.S., LL.D., &c. (London: Whittaker and

Co.), forms one of the Specialist Series of volumes published by this firm. Dr. Lodge's manual is a very complete handbook, the outcome, we are told, of a couple of lectures which he delivered at the request of Sir Trueman Wood, at the Society of Arts. The author exposes many of the current ideas as unfounded, and as not verified by experiment, the fact being that the momentum of an electric current has not been taken into account, and the old "drain-pipe idea" of conveying electricity gently from cloud to earth has been proved to be wrong. From the conclusions of this authority it was thought that lightning-rods were unnecessary, but the author says they are "essential to anything like security, notwithstanding the freaks of lightning strokes." But the system of metallic protection now advised is that known as the "cage system," in which wires are carried along all the prominent portions of a building. We recommend Dr. Lodge's work to the attention of all architects.—*Charing Cross to St. Paul's*. Notes by JUSTIN MCCARTHY, M.P., and vignettes by JOSEPH PENNELL (London: Seeley and Co., Limited), has already appeared in the *Portfolio*, but will be welcomed in this form by all who have already seen it. Mr. Pennell's pictures and Mr. Justin McCarthy's chatty paragraphs go well together. By the way, the former should have taken our bit of the Strand, as we are shortly to disappear before the ravaging tooth of the London County Council. It is a little hard that twice in a decade we should have to change offices in obedience to the march of improvement. The Duke of Bedford turned us out to make room for Covent Garden Market extension, and now it seems likely our place and habitation are to be lost in the wide opening that is to be made into the Strand by "the Council Broadway."

CHIPS.

The opening meeting of the Royal Institute of British Architects will be held on Monday evening next, when the inaugural address of the session will be delivered by the President, Mr. MacVicar Anderson. The next public meeting of the R.I.B.A. will be four weeks later, Dec. 5th, when several papers on "The Sanitation of Cities" will be read.

The late Baroness Taunton has bequeathed to the National Gallery a picture of the Holy Women at the Sepulchre, by Mantegna.

The stained-glass window which has been placed at the west end of Aylesford Church, in memory of the late Mr. H. A. Brassey, J.P., was formally presented on Friday. The work has been carried out by Messrs. Burlison and Grylls, of London. Our Lord, St. Peter, and St. Andrew are represented, and at the bottom of each figure there are representations of acts of mercy and charity. At the top of the window, which is a three-light one, are placed the arms of the Brassey family, and also the arms of the county. The mason's work has been carried out by Messrs. Wallis and Sons, of Maidstone.

The marriage took place on the 27th ult. of Mr. Edmund Woodthorpe, vice-president of the Architectural Association, of Grayshotts, Hants, and Circus-place, E.C., to Annie Kate, eldest daughter of Benjamin Warner, of Wanstead and Newgate-street, E.C.

The corporation of St. Helen's, Lancs, have adopted plans by Mr. Brown, their borough surveyor, for an extension of the fever hospital at Peasley Cross, so as to accommodate 24 extra beds. The estimated cost is £2,500.

The new public rooms at Bodmin were opened last week by Mr. Courtney, M.P. The large hall is 80ft. by 40ft., has an open-timbered roof, and is seated for 800 people; the smaller hall is 35ft. by 20ft. The architects are Messrs. Octavius Ralling and Lewis Tonar, of Exeter, whose design was obtained in competition among the architects of Devon and Cornwall. The work has been carried out by Mr. Sampson Trehane, of Liskeard, under the supervision of Mr. M. Oliver, clerk of works. The cost has been £3,500.

The new workhouse infirmary for the Guardians of the Dawsbury Union, which is being erected at Staincliffe, is nearing completion. The work is being carried out from the plans and under the supervision of Messrs. Holtom and Fox, architects, of Dawsbury. The whole of the large wards are warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves, with descending smoke flues, and in the smaller wards and day-rooms single-fronted patent Manchester stoves are used. There are some thirty of these Manchester stoves used in all, the whole being supplied by Mr. E. H. Shorland, of Manchester.

Correspondence.

WALSALL PUBLIC BATHS COMPETITION.

To the Editor of the BUILDING NEWS.

SIR,—My attention has been called to an effusion in your issue of 21st inst., emanating from one who subscribes himself "Disgusted Competitor," and who informs you that from the account he read of the above, he gathered the following—viz., that:—

1. "Two of the three premiated designs will not go on the land, the first encroaching on the land reserved by the Council for the erection of shops."
2. "Neither the first nor second designs has separate entrances to the female slipper-baths."
3. "There is only one entrance to Design No. 1, over which coals and everything have to be taken."

4. "No provision for replacing the boilers is made. I have heard it said that if this plan (No. 1) is carried out, and anything goes wrong with the boilers, the baths will have to be pulled down to take in a new boiler."

Now, although such absurd misstatements might be treated with the contempt they deserve, I having been for the last twenty-five years intimately connected with the designing and construction of public baths, and the designer of No. 1, think it only fair to your readers and

SIR,—The statements in my letter in your issue of the 21st ult. were obtained from the Walsall papers of the 15th ult. I would recommend the competitors in the above competition to get either the *Observer*, *Free Press*, or *Advertiser*: they will then be able to form an opinion as to the accuracy of my statements and the merit of the selected designs.—I am, &c.,
Walsall. DISGUSTED COMPETITOR.

SIR,—In the instructions issued for the above it is distinctly stated that "any architect revealing his incognito intended to be preserved by the 'motto' to be adopted by him will be disqualified for selection." Yet in the face of this definite clause, is it a fact that the author of the design placed first, though not directly disclosing his name, yet went so far as to say that he had erected the baths at Camberwell?

Surely this amounts to the same thing, and should have been enough to disqualify him. Yet he was placed first. It shows that the statement biased the committee, for one of the councillors referred to it in the discussion by saying he would rather trust one who had erected baths than a novice.

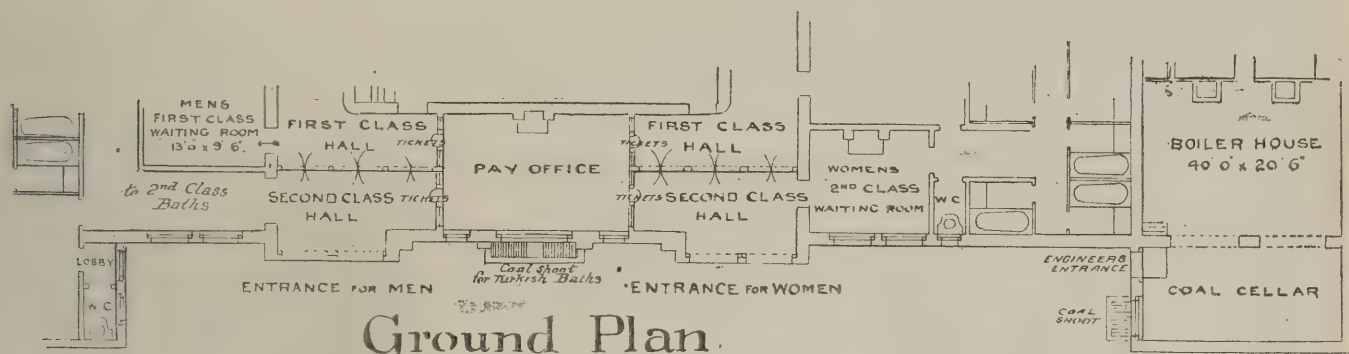
That there was considerable difference of opinion in the council with regard to the committee's recommendation is evidenced by another councillor, who moved an amendment that a professional assessor should be called in, saying

the error at 40 links, and (as the proportion of alteration varies as the error changes) to compare the two results and say that I said 5.5 was half of 24, if it is not wilful misrepresentation, is due to want of knowledge of the method used. As I stated in my last letter, when I thought that "Northman" did not quite understand the method, I took his exact figures in my letter in your issue of September 23. Surely he would do better to argue about these exact figures than to make himself ridiculous by arguing about a method he obviously fails to comprehend.

With regard to Fig. 4, it makes a considerable difference whether B C is measured from B to C or from C to B (the direction of scaling off the drawing, of course, makes no difference).

I. Measuring from B to C. If the position of D is counted 40 links out, A F will show the error by an alteration of 22 links, as I stated in my letter in your issue of September 23. If an error were committed by dropping one arrow in exchange between B and D (if the distance was long enough), the whole length B C would be altered, A F would show no alteration, and E D would be the check on my diagram. The error could not be less than one chain, and E D would show it clearly.

II. Measuring from C to B. A F will not show any error committed. In this case E D is the check on my diagram, although, as set out, not intended to show errors so small. Then E B would be a better check; but the question



Ground Plan.

myself that I should have an opportunity of refuting them, and this I feel sure, you Sir, with your usual fairness, will allow me to do so. I will therefore take them seriatim:—

1. No. 1 design, instead of encroaching on the reserved land, is in strict accordance with the limits laid down as to setting back.

2. It has separate and distinct entrances, both for the men and women's slipper baths.

3. Besides having separate entrances for men and women, it has also an engineer's entrance at side and two coal-shoots—one for supply of Turkish baths, and the other for the boilers.

4. In my design, the boilers are placed in a shed at the side of the main building, and could be removed and replaced at any time without disturbing any part of the main structure.

Should "Disgusted Competitor" desire it, I will instruct him, not only how to get a boiler out, but also how to set one.

The above facts will, I think, be sufficient to enlighten your readers (unless they all happen to be "disgusted competitors") as to the manner in which your correspondent (because unsuccessful) has endeavoured to depreciate the designs of his more fortunate brethren. Why does he not give his name, and let us see his design? It would, no doubt, be interesting also to know where he derived the information on which he bases his strictures. From what he says, he has evidently not seen the plans, and only obtained his information from newspaper reports or from hearsay.

Might I suggest to your correspondent, whoever he is, that, when next he takes upon himself to criticise designs which he has not even seen, he should at least be sure that the information "he gathers" is correct?—or otherwise I fear that if his designs are in accordance with his facts, he will never sign himself anything but a "Disgusted Competitor."

I inclose you a tracing showing the arrangement of the entrances and pay-office and boiler-shed in my designs.—I am, &c.,

HORACE T. BONNER, A.R.I.B.A.

that if the boilers as shown on the selected design burst, they could not be removed after once being fixed in the positions shown.

Another councillor pointed out that the Turkish baths as shown could not be ventilated, and objected to the positions of the closets.

The design placed third had the following points, which I suppose specially recommended it for selection:—Size of dressing boxes 2ft. by 1ft. 3in., 1st and 2nd class entrances, but the classes intermixed. No waiting-rooms, and the entrance through a road 9ft. 6in. wide, encroaching 3ft. on to adjoining land.

The 2nd and 3rd premiums were, however, awarded to Walsall men. This perhaps explains the selection.

The second design also has dressing boxes 2ft. by 1ft. 3in. It seems to me a great pity that the town council invited professional gentlemen to waste their time in sending in designs if they did not mean to deal with the matter in a perfectly fair and straightforward manner, and although I do not suppose it would have much effect, I would suggest that every competitor who fully complied with the instructions should sign a memorial protesting against the way this competition has been decided. I hope, for the credit of the town council, there was no wire-pulling; but the significant remark of one councillor who would not vote, and gave as a reason that he saw "so much fingering on the subject," almost compels one to come to the conclusion that all was not fair and above board.—I am, &c.,

ANOTHER COMPETITOR.

LAND SURVEYING.

SIR,—With regard to Fig 5, I have already answered "Northman's" letter of Oct. 7 completely. All I can do is to repeat my answer in different words in the hope that I may thus make it clear to him. The method I used (which for convenience I have called the "approximate method") depends on the premise that the error is infinitesimal, in which case the figures I have given are (approximately) correct. "Northman" took

whether E D is sufficient is one of opinion, and in matters of opinion authorities are the only guide. I wished to show that experienced and reliable authorities have considered such a check sufficient, and the statement by "Northman" in your issue of Oct. 7, that his check is the correct one, is a most unwarrantable statement. In the way he has measured, it is more accurate than E D, but it is not correct.—I am, &c.,

Gravesend, Nov. 2.

G. W. COBHAM.

A SLUMBERING INSTINCT.

SIR,—One of the many directions of modern advancement seems markedly to be the substitution of conscious mental effort for the far humbler and unconscious effort of instinct. We are more and more moved by an eminently complex intellectual appeal, and less and less by unreasoning, though in itself more decisive, instinct. Our instincts are invariably influenced, and most often fettered, by our reason. The sense of propriety is the all-governing sense, propriety of thought as of the realisation of thought. We dare not trust our instinct—if we, by chance, ever have it—unless, as is rarely the case, our hard, shrewd intellect supports it in every direction it may tend. We like to be charitable: Intellect whispers, Beware of imposition. We found a society and fasten up our purses. We love: Intellect insinuates, Is it prudent? We stick to the counting-house and go, for distraction, to the Alhambra. We feel we can design: Intellect says we must be properly instructed. We pass our grade at South Kensington and—we design. Method of reason must govern the waywardness of instinct. Our faculties of inward perception are numbed and of nought; the antinomies of pure reason give us infinite joy, and we have built, and live in, Belgravia and South Kensington.

Yet there is room in us for both reason and instinct: neither should be disparaged, and neither can be set at nought. Our faculties, both perceptive and receptive, should be suffi-

ciently enlarged to value both at their true worth. The human soul, as has been well said, is hospitable and capable of giving entertainment to conflicting sentiments with the utmost impartiality. Let us be but impartial in our hospitality, and award as good lodging to what we feel to be right as to what we think we know to be right, and instinct would be reborn to the world's advantage. But for our partiality, scholasticism would never have usurped the place properly belonging to the wider range of instinct. The age would have been more inwardly and outwardly appreciative; there would have been more real beauty in our lives and habits, and, perhaps, less talk of it; a quicker acknowledgment of the necessity of beauty in little things as in great, since the great things, after all, are made up of little; commercialism assuredly would have been the servant rather than the mistress of art.

It is to this practical advantage of the awakening of a certain instinct—that of the beautiful in all things—that I would now more particularly point. There can be no particular cause why this instinct should be divorced from reason and reason's god, Commercialism; but there is every reason why the two, for their mutual benefit, should be united. They are not in themselves antagonistic. That they can be and have been united is proved by the truthful record of the world's art. In our country alone, the placing as much as the designing of our cathedrals, the grouping of our villages, the making of our roads and lanes, the cottage furniture, the cottage garden, the almshouses, manor-houses, and homesteads prove the undoubted existence of some mighty instinct for beauty in its purest and most significant sense, for which we were richer then and are poorer now. In the stricter domain of pure commercial utility, witness the effort which beauty makes to the present day in the utensils in common use in the smaller Italian towns, such as the water jars of Ancona or Bari, in which we may detect a careless instinct for the admirable in outline as in workmanship and material, which is all the more fascinating because it is careless, and obviously the result of accident rather than of pre-meditated design. Yet now this feeling of the needfulness of some sort of beauty in all around us is absent. We take all that is given us, no matter in what form, and are thankful. We praise God and the manufacturer, for both are omnipotent. In little, as in great things, our reason dominates our instinct. A bowl is to hold water: what can be better or more suitable than an American bowl of glazed paper intended to represent granite? What can be more beautiful than a zinc bath made to represent marble inside and oak outside, or a bent wood chair or mosaic linoleum, or anything and everything that the manufacturer produces in his ignorance of reason for our use and in sheer, wanton defiance of our instincts? If there is any method in all this, and reason is method no less than is a governing perception, it is simply a method which has for its aim the promotion of unloveliness, and this is an attribute one would wish not to ascribe to the power of intelligence which rules the world. We are careless of beauty, and the keen manufacturer accurately gauges our powers of resistance. He thinks in his wisdom and counting-house that the instinct for consideration in all matters of design, which once was ever present, is now dead and gone; it is for us to prove that it can be recalled to life.

No one would blame the manufacturing producer for all this. He is simply a product of a reasoning age—an age that counts utility more than beauty, and cannot see that both are of equal value, or why utility should not be invariably appraised in shoddy. The much-abused and oftentimes maligned manufacturer is really our *alter ego*—or our Frankenstein. He is what we ourselves make him. We are indifferent, and so he becomes indifferent also. The worst of it is that our indifference, in the first place, is a negative quality; the manufacturer's indifference speedily becomes a positive quality working invariably in the direction of ugliness. The rankest growths are the strongest when tended by neglect. A harmless necessary stove and fender, under a stimulating course of indifference, speedily become overlaid with ornamental excrescences, whose designer, were we charitable, should be mentioned in our prayers. The genius of Curtain-road makes sport of us; picture-dealers give tone to and rule the market—it surely cannot be long before we have a fully-recognised,

open picture-exchange, and the ruling prices quoted day by day in the money articles of the papers—fashion and “this season's goods” are firmly-rooted in all the wide domain of decorative art, and unfortunately we get both novelty and fashion whether we desire them or not. Yet it cannot be doubted that were our right instinct aroused, we should not delegate our responsibilities to the unchosen few, and we should in consequence be richer in all those countless beauties of life which are now the sole definition of wealth.

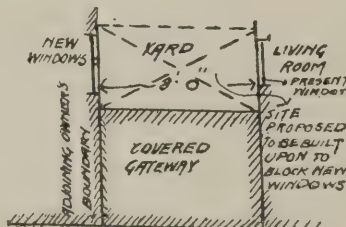
We have no right to assume a wealth we do not possess. Our reason seems to be perfectly satisfied with things as they are. Our instinct, if we would but allow its influence to be felt, is certainly dissatisfied. And until reason admits that instinct is a power to be reckoned with, we shall jog along as we are without change. And reason can only be influenced by something as great as itself. Let us admit that, and awaken our innate perception of the beautiful, which, in this connection, I like to think is, without the additional power of any personal genius, a universal instinct; for then and then alone will reason meet its match and be compelled, in its own interests, to acquiesce in a partnership which should never have been dissolved. Art will be the richer for its universal acknowledgment as a necessity of being; the manufacturer should be no poorer; the conditions of labour would be rendered more interesting and bearable; and we, the purpose of all manufacture, would have the additional satisfaction of knowing that by our effort alone the change was wrought, and would enjoy the subtle pleasure of our very own labour.

The power to effect this is in us all, but now it slumbers.—I am, &c., LEWEN SHARP.

Intercommunication.

QUESTIONS.

[10878].—New Lights in Old Boundary Wall.—Has an adjoining owner legally a right to break out new windows in an old wall (which forms the boundary)



where none have ever existed before, and which immediately overlook his neighbour's living and bedrooms, about 8 ft. distant? Also, if a high fence, wall, or a building could be erected in the 8 ft. space, which would completely block the new windows?—LEGAL.

[10879].—Stucco Front.—I am repairing an old house having a painted stucco front, which is not worth repainting, and I want to know if there is any binder which, if put into water colour, would make same adhere to painted surface?—S. A.

[10880].—Fireproof Floors.—Can any reader inform me—without partaking of the nature of an advertisement—what are the best systems of fireproof or fire-resisting floors now in use for domestic buildings of the better class? It appears probable that the London County Council and the municipal authorities of our larger towns will, in course of time, put a limit upon the use of wood in floors of buildings where they have control, and it is very desirable to know what are the advantages of special systems, and if there is any plan more economical than the better-known patented methods of fireproof floor construction, and which would do equally as well for ordinary buildings?—VIATOR.

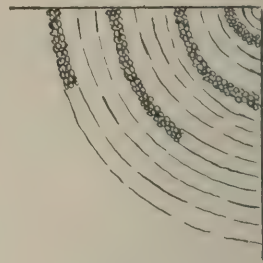
[10881].—Severn Tunnel.—Can anyone inform me what sort of brick the arching of the Severn tunnel is executed in? Also, whether there are pumping stations in the tunnel?—DOUBTFUL.

[10882].—Water Pipes.—I shall be much obliged if some of your readers will tell me, through the medium of your paper, what are the best descriptions of pipes to adopt in a house where the water is so soft that it acts upon lead?—INQUIRER.

REPLIES.

[10833].—Timber and its Position.—I am very sorry for suggesting to “E. S.” that he should read some authorities on the growth of timber, when it appears he did so half-a-century ago. However, if he will look through pages 362, 363, and 364, of Rivington's “Building Construction,” Vol. III., he will find the names of the woods which show the most clearly the sap valves or pores. I give sectional sketch of an ash-free stump taken on the spot, which had been felled but a short time. The annual rings are considerably enlarged, so as to show the sap-valves more plainly; but they are quite distinct in

the stump. To see the section clearly it is necessary to cut the stump with some sharp instrument, such as an axe, and not with a saw, as is generally the case with



balks of timber found in a timber merchant's yard.—SIDNEY F. HARRIS.

[10852].—Tidal River Bath.—I must thank “Tidal Wave” for his sketch, which shows the case to be rather more complicated than appeared at first, and still, I think, lacks some necessary information. The sketch seems to show that the pipe is to be laid level, and that the dimension 4 ft. is from top of coping of filter wall to H.W. level. What is depth of filter? How far and to what level does bottom of bath slope up? There is an error either in the capacity of bath as given in query of Sept. 16, or its dimensions given in sketch, as a bath 150 ft. by 3 ft. by 7 ft. deep all over would only hold 215,870 gallons, and if it slopes up to a shallow depth, as sketch denotes, necessarily much less still. However, I give the formula I would suggest for calculating the size of pipe, providing bottom of bath was horizontal, and at, or not much below, the invert of pipe:

$$D = \frac{1}{15} \sqrt{\frac{G^2 L}{H}}$$

where D = diameter of pipe in inches
G = number of gallons per hour
L = length of pipe in yards
H = head of water in feet (Hawksley.)

and in this case would be half the difference of level between invert of pipe and high-water line. By this working we should have an error on the safe side, partly owing to a small portion of contents of bath being below the pipe, and partly owing to the head being measured from invert instead of axis of pipe. This is allowing nothing for obstruction to the flow of water by the filter, and I take it that there would be some arrangement by which the mouth of pipe would be kept clear of gravel, and that the gravel would be coarse enough not to impede the requisite velocity of flow through it. From a few rough calculations I have made, I think the pipe would not have to be less than 18 in. diameter. I certainly think in a case of this kind—where the matter is complicated by the question of the filtering medium, and also by the sloping bottom of bath—that the best way is to make a small working model to scale, and experiment with a few sizes of pipes. The expense would be trifling, and the trouble really not much. I shall be pleased to add any further information in my power, and should like to see opinions of other readers of the “B.N.”—N. B. D.

[10870].—Dry Rot.—The whole of the timber must be carefully examined, and every particle affected by dry rot removed. If the spores have penetrated the brickwork the joints must be thoroughly raked out as deeply as possible, and repointed in Portland cement. Should the plaster of ceilings or walls show signs of being affected, this should also be removed. After clearing away all material affected by the fungi, thoroughly saturate the remaining and adjoining timbers and brickwork with the solution known as “weed killer,” made by the Horticultural Chemical Company, Milton street, Glasgow, diluting each quart of same with, say, a gallon of water. This is a very inexpensive chemical preparation, which I have found most effectual in arresting the ravages of this most insidious and insinuating enemy. I should also dress the new timbers with the same preparation, giving two or three coats. In replacing wall-plates or sleepers be careful to keep them free from the walls. In nine cases out of ten it will be found that the dry rot originates in the sleeper walls or ends of timbers carried into damp walls, or from wood blocks or plugs built in for fixing skirtings, &c. This can generally be avoided by trimming or corbelling. If “Ex-wise-ed” can spare the funds, I think he would find it advantageous to construct a dry area round the outside of the basement wall, or at least, to render the inside with Portland cement in lieu of plaster. I need hardly add that the new timbers and woodwork should be thoroughly dry, and, if not absolutely necessary, the underside of ground floor joists should not be ceiled, but left exposed to the air. I have found that the fungi will flourish and spread in both plaster and mortar, and have known the spores to travel through a brick wall 8 ft. in thickness, but to stop short at a thin facing of Portland cement. Everything depends upon the thoroughness with which the operations are carried out; but I have found that by following the method above advocated the fungi can be completely destroyed. Some two years ago I had occasion to deal with a floor the joists of which for a distance of about 5 ft. from the wall were thoroughly impregnated with dry rot. To avoid disturbing the whole of the floor, which would have caused serious inconvenience, I had the affected portions of the joists carefully adzed off where possible, and the remaining thickness saturated with the above-mentioned preparation, as well as the brickwork in which the disease appeared to originate, and on examining the floor recently no sign of any further decay appeared, and in many similar instances I have found it entirely successful. I must, however, add a word of caution—viz., that the “weed killer” is a strong poison, and should therefore be used with discretion, and the vessel containing it kept under lock and key.—E. CHART.

[10870].—Dry Rot.—Scraping off the fungi, and afterwards painting with red-lead, is not quite radical enough

to cure the ravages of dry rot. "Ex-wise-ed" will probably find the fungus behind the timber and in the joints of the brickwork. The writer had a case this summer where he found the fungus 4½ in. from the face of the wall. It is easy yet to say whether the rot is cured, but we dealt with it in the following way:—Removed all affected woodwork, cut away 4½ in. of brickwork from the face of the affected walls, dressed the place with coppers and quicklime (hot), set new bricks in cement, and fixed new woodwork. This is somewhat expensive; but a cure for dry-rot is cheap at any price.—DEPUTY B.E.

[10870].—**Dry Rot.**—The situation of the house is unfortunate, so near a bank, the drainage of which must always keep the cellars damp. Ventilation is necessary, and no doubt the want of an air current caused the disease in the first instance. The dressing of turps and red-lead on the new timbers was undesirable; the timber would, in fact, have been better without such paint, as it stopped the pores and confined the moisture inside. Painting, and even creosote, only kills the *mycelium* on the outer skin; but does not affect the interior of the wood. I should advise all the rotten timber to be removed, and well-dried timber substituted, the ends of all joists and timber being creosoted. The brickwork should be thoroughly dry or covered with asphalt; but every vestige of the diseased timber or spores should be removed or burned. I should cover the whole of the floor of cellar and walls with asphalt, or some impervious solution.—G. H. G.

[10871].—**Overhanging Cornices.**—An adjoining owner can complain if no prescription or easement has been acquired. If the cornice or eaves project so as to discharge rain-water upon the neighbour's property, it is a nuisance for which an action will lie. But an overhanging eaves cannot be interfered with if the right has been acquired by user. In any case I should advise "G. T." to avoid the projection by having an internal gutter, as it is clearly against the local bylaws; or otherwise to obtain consent of his neighbour.—G. H. C.

[10872].—**Covering Area of Building with Concrete.**—The rule is in operation, and ought to be enforced. The recent by-laws of the L.C.C. under section 16 of the Metropolitan Management and Building Acts Amendment Act 1878, make it compulsory to coat the "site of every house with a layer of good concrete at least 6 in. thick." If any house built since Oct. 1891, is without this layer it is certainly a violation of the by-law.—G. H. G.

[10873].—**Boasting.**—"Boasted" work in masonry means covering the entire face of the stonework with parallel lines, about ten to the inch, and producing a corduroy appearance. The boaster is a chisel 2½ in. or 2 in. wide. A good mason will make the lines vertical, whilst a careless or incompetent man will make an angle of ten or more degrees from the perpendicular.—ONE WHO DOESN'T MIND TELLING.

[10875].—**Drainage of Dwelling-Houses.**—Where it can be done, I both advise and practise the disconnection of the soil-pipe at or near its foot from the main drain of the house. I think this is especially advisable in mansion houses where there are a number of closets, and some of them at times not used for weeks or months.—W. P. BUCHAN.

[10876].—**Cistern.**—Some twelve months ago I had to deal with a lead-lined cistern that was eaten away in a similar manner to that described by "Tecton," though in this case there were no copper gutters near. I believe the corrosion arises from the particularly powerful effect which soft rain-water has in dissolving lead. The only cure is to remove the lead cistern and employ galvanised iron.—GILBERT W.

CHIPS.

At the last meeting of the Warwickshire County Council the asylums committee were authorised to employ an architect to prepare plans and estimates for the extension of the existing asylums.

On Friday last, the 28th ult., Colonel Luard, R.E., inspector Local Government Board, held an inquiry at Littlehampton with reference to an application of the local board for power to borrow £1,200, wherewith to erect offices. Mr. A. Shelley, clerk to the local authority, gave evidence as to the board's proposals, and the surveyor, Mr. H. Howard, F.S.I., produced and explained the plans.

Messrs. Baird, Thompson, and Co. have recently patented and are introducing an entirely new complete system of automatic and mechanical ventilation and warming, which can be readily adapted for the ventilation or warming (or conjointly as may be required) of all kinds of public and private buildings, schools, hospitals, sewers, mines, ships, &c., &c. A representative of the firm sailed by the Orient liner steamship *Ormuz*, on the 21st ult., en route for Australia, for the purpose of introducing their system into several important buildings. While there he will make an extended tour throughout Australia, besides visiting other parts abroad. Messrs. Baird, Thompson, and Co. have purchased the patent rights, models, and working plant, together with the goodwill of the business of Messrs. T. W. Greenwood and Co., ventilating and heating engineers, of Birmingham and Manchester, and it will be continued by them in all its departments, the whole of the present staff being retained, while Mr. T. W. Greenwood has been appointed district manager and representative. In order to cope with their increasing business, and to greatly further facilities for the expedition of contracts entrusted to them, plans are being prepared for new works, besides extensions to their present works; and a new department has been lately added—viz., that of sanitary drainage, water supply and analysis, and electric lighting.

Legal.

CONTRACTS FOR WORKS AND SERVICES.

UNDER the short title of "Labour Contracts" (Crosby Lockwood and Co.), Mr. T. F. Uttley, solicitor, has edited the fourth edition of the well-known handbook by David Gibbons upon the law of contract for works and services. In doing so he has brought the book down to date by quoting recent cases, and by adding a very useful appendix of what may be termed Labour Statutes from the Truck Acts, 1831 and 1887, to the Shop Hours Act, 1892, thus giving the full text of 14 important statutes, and including the Factory Acts, and Acts affecting master and workman, employers' liability, trade-unions, and arbitration. A few forms are added which may be useful in small matters. The book is carefully written as far as it goes; but the chapters are rather general, and it would have been more useful for reference if less notice had been taken of the older authorities and the new statutes had been more specially and separately considered. As it now stands the book gives one the impression of having been somewhat roughly thrown together and added to as occasion required, and it would be much better with most of the old cases struck out and the whole subject-matter rearranged in convenient sections. Still, there is a good deal of reading in the book that may well be useful to those concerned in the hiring of workmen.

But the law is so rapidly changing in its view of labour and labour contracts that it is not easy to see where we stand. The operations of trade-unions have done a great deal to make the task of carrying out building contracts a matter of much risk and difficulty. Yet this only the beginning of changes that are actually impending. As these come about, it will be necessary for those who draw up, and those who work under, such contracts, to provide for new risks and further liabilities. There is no doubt that we are about to witness some changes in the hours of labour, which must mean a rise in wages. It is quite certain that the unsettled question of employers' liability for accidents will not remain much longer in its present attitude of confused compromise. Probably masters will be made liable for all accidents, except such as clearly arise from the fault of the men themselves. If this is done, then the only way out of it will be for employers to cast the increased risk upon the insurance offices who do this class of business, and add their premiums to their trade expenses. In this way the charge will fall upon the customer by increasing the cost of production, and will have to be allowed for in any estimate and contract for works. Another coming change is probable to be found in the appointment of Court of Arbitration for the prevention and settlement of strikes, a change that would be beneficial to all concerned. The recognition of the claims of labour is no new thing, it is clearly written in our "Statute Book," but the progress made so far has given a great impetus to the movement, which is now going forward at a much more rapid rate. The true business aspect of the question is to recognise the coming changes, and to reckon for them as far as possible in all labour contracts. FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

PERPLEXED.—WALL.—WINDOWS.—You cannot prevent an adjoining owner from opening windows overlooking your premises. But you can erect a hoarding or wall, or anything else on your own ground, and so block them up and prevent them becoming ancient lights. Probably if a hoarding is put up, he will consent to close them, or some written agreement may be made, and rent paid, when no rights would accrue.

A Wesleyan chapel is about to be built adjoining an existing Sunday-school at Bishopston, near Bristol, at a cost of £3,000. Mr. Herbert Jones, of Bristol, is the architect.

Acting on instructions from the Baroness Burdett-Coutts, Mr. Richard Sisk, builder of the Baltimore Piscatorial Industrial School, is constructing a model of that institution for exhibition at the Chicago World's Fair. The work will occupy some months, and the completed model will be about the size of a cottage of medium dimensions.

LEGAL INTELLIGENCE.

THE EXTRAORDINARY CHARGE AGAINST A LOCAL BOARD SURVEYOR.—We regret that, by a printer's error in our report (p. 619 last week) of this absurd and unfounded charge against a surveyor to a local authority, "Southport" was substituted for "Stourport." Mr. William Crabtree, who has been the surveyor to the borough of Southport for the past quarter of a century, kindly draws our attention to this error, and we are indebted to him for his courtesy.

A BANKRUPT BUILDER REFUSED HIS DISCHARGE.—At the Swansea County Court, on Oct. 28th, application was made on behalf of David Richards, formerly a builder, trading as Richards and Son, of 5, Melbourne-place, and of Northampton Yard, Swansea, for his discharge in bankruptcy. The Official Receiver's report showed that the receiving order was made in 1884, and the liabilities were £1,491 1s. 3d., and the assets, after deducting preferential claims, £306 6s. 10d., and a dividend of 3s. 2½d. had been paid. The debtor omitted to keep usual and proper books of account, and as to sufficiently disclose his business transactions and financial position within the three years immediately preceding his bankruptcy. After examining the debtor, the judge expressed his surprise at the recklessness he had shown. The application was refused.

DEFECTS IN THE EMPLOYERS' LIABILITY ACT.

—His Honour Judge Ellison gave his decision, on Oct. 27, in the action brought in the Sheffield County Court by Thomas Silcock, a bricklayer, against Walter Shaw, builder, Abbeydale-road, to recover £15 under the Employers' Liability Act. The plaintiff sustained the injuries by the fall of a scaffolding on which he was working while in defendant's employ. The scaffold had been put up by Martin Connor, who, according to plaintiff's case, was foreman scaffolder. But the evidence called for the defendant showed that so far from being a foreman scaffolder, Connor was only an ordinary bricklayer, and was at the time engaged on another job when one of the men fetched him to put the scaffolding up. So that not only was he not intrusted with the work, but in doing it he was committing a breach of duty by neglecting his own job. The plaintiff's case, therefore, entirely failed, and it was another illustration of the way in which these cases did fail, because the defendant, being a builder in a very small way, had apparently no such thing as a foreman. Any scaffolding had to be erected by the men amongst themselves, and therefore, as no one was intrusted with the work at all, there could be no possibility of recovering under this Act of Parliament, because it would be a case of common employment. Judgment would be for the defendant, but he did not think there ought to be any costs.

PAYMENT FOR THE TOOL-GRINDING HOUR.

—Mr. Charles Wall, a builder, of Chelsea, was summoned at Highgate police-court on Monday to show cause why he should not pay the sum of 10d. The complainant said he was employed by the defendant as a bricklayer, and at the completion of the job was discharged, when he was paid in full, with the exception of 10d. (one hour's pay). The custom of the building trade was to pay bricklayers an hour's pay over and above the time they had put in. The plaintiff produced the rules of the society to prove this. The Society had found the money for him to go on with the case. The defendant did not appear, but had paid the money into court.

CURIOUS ACTION BY AN UNDISCHARGED BANKRUPT.

—At the Norwich County-court on Oct. 26, William Evans, Stanley-road, Northgate-street, Great Yarmouth, builder, sued his cousin, James Evans, Nelson-street, Norwich, builder, to recover the sum of £29 13s. 8d., balance due for tools detained and arrears of wages. Plaintiff said that on June 22nd, 1891, he was adjudicated bankrupt, and was still an undischarged bankrupt. Under the bankruptcy he was allowed certain tools, including hammers, cramps, saws, &c., and others to the value of £5. It was arranged that he should go as manager of defendant's business at South Walsham, at the wages of 30s. a week. He received £1 a week, a payment on account, it being understood when the books were made up that he should receive the back money. His connection with the South Walsham business closed in March last, when he received a notice of dismissal from the defendant, who alleged that he had received certain moneys on account of the firm without accounting for them, and forbade him to go upon the premises again. His Honour thought it had not been shown that there was any agreement to pay more than 20s. a week, and entered judgment for defendant with costs.

WHAT IS A WAREHOUSE UNDER THE BUILDING ACT?—At Bow-street, on Tuesday, Messrs. Holland and Hannen, builders, Duke-street, Bloomsbury, appeared in an adjourned summons charging them with infringing the fourth subsection of the 27th section of the Metropolitan Buildings Act. The case was heard a month since, when Mr. Vaughn

reserved his decision. (See report in the BUILDING NEWS for the 7th ult., p. 513.) In giving judgment, Mr. Vaughan said:—This summons has been taken out by Mr. Wallen, the district surveyor of St. Pancras, against Messrs. Holland and Hannen for irregularities in the construction of a building in Grafton-street, contiguous to the premises of Messrs. Shoobred, and intended, when completed, to form an extension of those premises, and for non-compliance with a notice requiring such irregularities to be amended. The building consists of eight stories, and its total height is 87ft. Mr. Ovenden, the architect, stated that the basement is to be used for packing goods, and the ground floor as a retail shop; that three floors immediately above are to be used as dining-rooms, and that the floors above them are to be used—one as a scullery and the other as a kitchen. A staircase leads from Grafton-street to the top of the buildings. There are four openings intended for lifts running through. The cubical contents of the whole building are 272,800ft., exclusive of the staircase, which is 16,656c.ft. additional. The cubical contents of the rooms above the concrete floor are 62,087ft. Mr. Wallen complains that the provisions of the fourth subsection of the 27th section of the Metropolitan Buildings Act have not been observed. By this subsection it is enacted, "That every warehouse or other building, used either wholly or in part for the purposes of trade or manufacture, containing more than 216,000c.ft., shall be divided by party-walls in such manner that the contents of each division shall not exceed the above-mentioned number of cubic feet. The first question that arises, then, is this:—Is this a building to be used either wholly or in part for the purpose of trade? That question must be answered in the affirmative. The next question that arises is the definition of a dwelling-house. Is this a building so constructed as to contain more than 216,000c.ft., and, if it does, is it so divided by party-walls as that each division shall not contain more than that number of cubic feet? In no sense can it be said that the statutory provision has been complied with. The complaint in this summons is well founded, and I am therefore compelled to make an order that the irregularities complained of shall be amended. Mr. Vaughan decided to allow £6 6s. costs, and agreed to state a case.

A MODEL WINDMILL AFFIRMED TO BE A SKY SIGN.—In the Queen's Bench Division on Tuesday, before Justices Mathew and Bruce, the appeal case of the "London County Council v. Carwardine and Co."—an appeal from a decision of Mr. Rose, sitting at Worship-street—was heard. The case was reported in our issues of March 18 (p. 423, last vol.) and July 15 of this year (p. 94, ante), when the case came before Justices Wright and Collins, and was referred back to the magistrate for restatement. The respondents were flour dealers in the City-road, and had upon the top of their premises a tower, on which there was a large model windmill, upon which there was a trade announcement. In addition to this, however, the mill was used for doing useful work, such as grinding flour, it lifted and lowered sacks of grain, and it worked a dynamo for the production of electricity. The County Council summoned the respondents before the magistrate upon the ground that the mill, with the inscription that it carried, was a "sky sign" within the meaning of section 2 of the Sky Signs Act of 1891. This statute defined sky sign as being any word, letter, model, sign, device, or representation in the nature of advertisement, announcement, or direction, over any building or structure, or upon any pole, standard, or other support. The magistrate held that this structure, with the letters upon it, did not constitute a sky sign within the meaning of the statute, but, at the instance of the County Council, he stated a case for the opinion of their Lordships. Mr. Justice Mathew expressed his opinion that what was complained of here by the County Council was a sky sign within the meaning of the Statute, and therefore that the appeal must be allowed. Mr. Justice Bruce concurred, and the case was ordered to be remitted to the magistrate, with an expression of the opinion of their Lordships.

THE LIVERPOOL JEWELLER AND HIS ARCHITECT.—At the Liverpool County Court, on Monday, before Judge Shand, John Byrne, jeweller, of Bold-street, sued Henry May, architect, 24, North John-street, for £48 6s. 6d., balance of money lent and amount of jewelry supplied. The defendant put in a counter-claim for £56 17s. 6d. for professional services, consisting of the preparation of plans and estimates for alterations to premises in the occupation of the plaintiff. The judge gave judgment for plaintiff for the amount claimed, less three guineas allowed to the defendant on the counter-claim.

CONVERTING A COACH-HOUSE INTO A STABLE.—At Bow-street Police-court, on Tuesday, a summons against Messrs. Titmas and Sons, builders, Grafton-street, was heard. Mr. Wallen, district surveyor, stated that, contrary to the Act, defendants had inclosed with a wooden hoarding a coach-house which Messrs. Shoobred had converted into a stable. He contended that, if the stable were

inclosed at all, it should be by means of a brick wall. Mr. Vaughan, whilst agreeing with the district surveyor's interpretation of the Act, adjourned the case with a view to a settlement being arrived at.

TRAVELLING TIME AND FEES FOR WORKMEN.—At Marylebone Police-court, on Monday, Messrs. Allen and Sons, builders and contractors, of Palmerston Works, Kilburn, were summoned by eleven of their workmen for refusing to pay their return fare to Dunstable, also for the time occupied in the journey, contrary to a contract made in the first instance. The claims of the men amounted to over 7s. each, the total being £3 13s. 6d. John Clinch, a painter, said he and others were engaged by one of the defendant's foremen to go from London to Dunstable to perform work for the defendants. The arrangement was that they were to be paid the railway fare, lodging money, and for the time occupied in the journey. The defence was that, according to trade customs, the men were only engaged from the arrival on the job; but the magistrate decided in their favour.

DAMAGES FOR FALSE IMPRISONMENT.—In the Edmonton County-court last week, before Judge Abdy and a jury, the action of Saps v. Hewitt, commenced a fortnight previously, was concluded. Saps, a contractor for carting, of Tudor-grove, Hackney, sued the defendant, a builder, of Houndsfield House, Lower Edmonton, for £1 15s. 6d., balance of account, and £20 for false imprisonment. There was a counter-claim of £10, the value of some stone alleged to have been stolen. The plaintiff's case was that he and a man named Saville contracted to cart rubbish from some premises in the City-road. They carted, according to the reckoning of the carters, 18 loads; but the defendant disputed this, and said it was only 16. Plaintiff gave way on the point, and received from defendant's foreman £1 on account of the bill of £2 15s. 6d., leaving the balance sued for due. In the course of the carting it seems that the cartmen were asked to cart away some stone, and one of them did so in a cart belonging to defendant, but without his knowledge, and then disappeared. Some days later defendant, exasperated at not being able to trace the man, gave his late employer (the plaintiff) into custody; but did not appear in support of the charge. A verdict was given for plaintiff for the amount claimed, with costs.

IN RE A. HOOD.—Alfred Hood, builder and contractor, Bethnal Green, has furnished accounts showing liabilities £1,531, with assets £314. He commenced business in 1880, with about £250 capital. He attributes his failure to bad and doubtful debts, to losses on contracts, to loss in connection with a building speculation, and to law costs. The Official Receiver states that £306 of the assets are the subject of dispute, and of uncertain value. The debtor has been adjudged bankrupt.

ACTION BY MORTGAGEE AGAINST SURVEYOR.—DENNES v. GOULD.—This action, heard by Mr. Justice Wills on Saturday, raised the point whether the mortgagee of house property mortgaged by the building owner as security for advances to the builder can sue the surveyor who has been employed by the owner, the mortgagor, to act as valuer to certify for such advances for negligence in certifying for advances not really due in respect of work not duly executed. As reported in our issue of Aug. 19 last, p. 269, one Hunt was the owner in freehold of land at Ilfracombe on which he desired to erect houses, and proposed to mortgage to one Dennes (the plaintiff), who was to make the advances according to a schedule of advances. Hunt accordingly executed a mortgage to Dennes, the deed being attested by W. H. Gould, the surveyor to the local board of Ilfracombe, and whom Hunt employed to value the work as it was done and certify for instalments to be paid by Dennes. Hunt had entered into a contract with a builder to erect the houses, and from time to time Gould gave certificates, on which Dennes, the mortgagee, made advances, and on certificate of completion the final instalments were paid. Then it was found that the work had not been properly executed, and that, in particular, the drains had not been executed as they ought to have been; and Dennes then brought an action against Gould for negligently giving certificates for work not duly executed. The action was referred to Mr. Ridley, the Official Referee, who found that Gould had been guilty of gross negligence, though not of fraud, and that the damage done to Dennes amounted to £300; but he came to the conclusion, on the evidence, that there was no contract between Gould and Dennes, and that, according to the authorities, the action could not lie apart from contract. The plaintiff relied on a decision of Mr. Justice Chitty in "Carus v. Wilson," in which, however, a contract was set up, and the defendant relied on "Schoales v. Brook," a later decision of Mr. Justice Romer, confirmed by the Court of Appeal, that the action could not be maintained by the mortgagee unless there was a contract between him and the surveyor who acted as valuer to give the certificates, and so the Official Referee gave judgment for the defendant. The plaintiff appealed. The Court, without calling on

defendant's counsel, held that the Official Referee was right, and that the action could not be maintained.

A TEMPORARY BUILDING.—Mr. R. Eddie was summoned by the London County Council on Tuesday last for erecting a temporary building at the rear of a house in Tyndale-place, Islington. Mr. Chilvers appeared on behalf of the council, and called Mr. Henry Lovegrove, district surveyor, to give evidence of the construction and position of the structure, which was of wood covered with sheets of corrugated iron. The magistrate, Mr. Horace Smith, ordered a fine of £3 and £2 4s. costs.

ARCHITECTS' CHARGES.—In the Queen's Bench on Tuesday last, before Justice Vaughan Williams, the cause Williams and Hopton J. Hutton was tried. The plaintiffs were architects in practice in Regent-street (but have since dissolved), and were instructed to prepare drawings of houses and shops at Swanley. They also claimed for an amount paid to Messrs. Mills and Jones for bills of quantities. Mr. H. Lovegrove and Mr. Dudley gave evidence on professional custom, and stated that the charges were fair and reasonable, and in accordance with the practice for similar work. The jury gave a verdict for the plaintiffs for the amount claimed.

CHIPS.

A railway-station in Elysium-lane, Bensham, near Gateshead, was opened on Tuesday. The designs were prepared by Mr. William Bell, the North-Eastern Railway Company's architect, and Messrs. George Lister and Son, of Crook, were the contractors.

The London County Council decided on Tuesday that the height of hoardings upon which posters are displayed shall not, after a certain time, exceed 12ft. They instructed the Fire Brigade Committee not to wait until the council is prepared to employ its own labour, but to obtain tenders at once for the erection of a new fire-engine station in Queen's-road, New Cross, for which working drawings have been completed. The amended tender of the Thames Ironworks and Shipbuilding Company was accepted at \$54,353 for the reconstruction of Barking-road bridge.

The purchase of the common at West Wickham, near Hayes, Kent, by a body of subscribers, has now been effected, and the Lord Mayor elect, Alderman Knill, will visit the common and declare it open to the public on Saturday in next week, the 12th inst. The lord of the manor, Sir J. F. Lennard, required £2,000 for his rights, towards which the City Corporation contributed £500.

Mr. James Mansergh, C.E., has reported to the newly-formed town council of Southend-on-Sea upon the sewerage system. He recommends that the sewers be extended and improved at an estimated cost of £10,000, and that two new sewer outfalls of 30in. and 27in. diameter respectively be carried about one mile from the shore, the present outfalls for which they are substituted being utilised as storm overflows. The outlay on this portion of the scheme is estimated at a further £25,000.

The Mayor of Northampton received on Friday a letter from Lord Wantage, offering to the town of Northampton, as a People's Park, a large residence, known as Abington Abbey, and about twenty acres of wooded ground, within two miles of the centre of the town. In recent years the Abbey has been used as a private lunatic asylum. On the lawn is a mulberry tree planted by Garrick in 1778.

The prizes awarded to competitors in the recent exhibition promoted by the Turners' Company were distributed by the Lord Mayor at the Mansion House on Friday. The chief of these was the Freedom of the Company and of the City of London, together with a silver medal and five guineas, awarded to Mr. J. Lawington, of Duck-lane, Soho, W.

The Bishop of Rochester dedicated on Saturday the first portion of the permanent building of the Gonville and Caius College Mission and Settlement, which has been erected at the corner of Holman and Harroway-roads, Battersea. The building will cost £6,000. It will consist of a large hall seating about 500 persons, and an annexe providing kitchen, caretaker's rooms, and club, in addition to classrooms. The upper floor of the main building is to be devoted entirely to church work.

The opening of the new schools in connection with St. Wilfred's Roman Catholic Church at Northwich took place last week. The structure is built in brick, with mullions of moulded bricks. The school is capable of seating 150 children. Mr. J. Cawley, of Northwich, is the architect, and Messrs. Clarke and Sons, of Middlewich, the contractors.

The managers of the Poplar and Stepney Sick Asylum have decided to enlarge their premises in Devons-road, E. The tender of Mr. J. Holland, of Poplar, amounting to £23,591, has been accepted for the work.

WATER SUPPLY AND SANITARY MATTERS.

SEWAGE PRECIPITATION WORKS AT WOODVILLE.
—For a long time past a stream flowing through Lord Carnarvon's property, near Burton-on-Trent, has been polluted by crude sewage discharged from the various factories situated at Woodville. A few months ago the directors of Messrs. Brunt, Bucknall, and Co.'s brewery, which produces a large volume of sewage and waste liquor, determined to set an example to their neighbours by erecting works for chemically treating the sewage. The works have been designed by Mr. Albert Wollheim, Assoc. M. Inst. C.E., of Leadenhall House, London, E.C. The sewage can be treated either during the entire day or accumulated in a siphon tank and treated only during the several discharges of the latter, and an electrical alarm will be connected with the office to give timely warning of each discharge. A night storage tank has also been provided. The precipitation tanks are in duplicate, and can be worked either on the continuous or separate systems. The treatment will be by the "Amines" process, which has been adopted on account of its property of destroying all germs capable of producing putrefaction, fermentation, or secondary decomposition.

TODMORDEN.—Mr. F. H. Tulloch, A.M.I.C.E., Local Government Board Inspector, held a public inquiry at the Town Hall, Todmorden, on Thursday, the 27th ult., in regard to the application of the Local Board for borrowing powers for loans of £5,600. Of this sum it is proposed to devote £1,600 for the decorations of the interior of the Town Hall, and £4,000 for sewerage of the Walsden district. The inspector afterwards visited the proposed line of sewer, accompanied by Mr. Shaw, A.M.I.C.E., surveyor, and Mr. Blackburn, nuisance inspector. The Local Board members have decided to sign the necessary documents for the purchase of the three gasworks in the Todmorden district, and to promote a Bill in Parliament for that purpose. The total amount of purchase money is £103,362 10s., equal to about 18½ years' purchase on the average profits.

CHIPS.

The laying of the foundation-stone of a new brewery in the High-road, Tottenham, which is being erected partly on the site of an old one established in 1824, took place last week. The architect is Mr. Wm. Bradford, and the builders are Messrs. Reed, Blight, and Co., of Plymouth.

The Linlithgowshire County Council have adopted a report by Messrs. Leslie and Reid, civil engineers, Edinburgh, for providing a water supply for the village of Linlithgow Bridge.

A north aisle, just added to All Saints' Church, Botley, Hants, was dedicated on Tuesday week. The church is Early English in style, and was built in 1836. The new aisle has been built from designs by Mr. T. Graham Jackson, A.R.A. The walls are of Swanage stone, with Doulton stone dressings, and the inside supported on open columns. The accommodation has been increased from 225 to 300 sittings. Mr. J. C. Bailey was the contractor.

The adjourned case of Joseph George Rogers, builder, of Timpon-road, Landport, and a member of the Portsmouth Town Council, came before the local Bankruptcy court last week, and was further adjourned till Nov. 14th, to allow of the preparation of accounts. The case is one of those arising out of the Portsea Island Building Society failure.

The parish church of Llanabhaiarn was reopened on Friday after restoration, from the designs of Mr. Kennedy, the work being carried out by Mr. Evan Williams, Bangor. The Bishop of Bangor preached.

The inaugural address of the new practical school for decorators in connection with Heriot-Watt College, Edinburgh, was delivered on Tuesday night by Mr. D. J. Vallance, lecturer on Ornament and Decoration in the College. The lecturer explained that the classes would be of an entirely practical character, but that for that evening he would treat the subject of the decorator's art from a more general point of view.

At the last meeting of the municipal buildings committee for Bth City, Mr. J. M. Brydon, F.R.I.B.A., presented the amended plans, which provide for the shortening of each wing of the building, throwing the space thus acquired into the roadway. The new plans were recommended to the council for adoption.

The foundation-stone of the new chancel and transepts of Weston parish church, near Bath, has just been laid by Mrs. Fraser, widow of the late Bishop of Manchester. The work is being carried out by Messrs. Stephens and Bastow, contractors, of Bristol, from the plans of Mr. E. H. Harbottle, architect, of Exeter. It will cost about £4,000, including the new oak seating in the existing nave.

Our Office Table.

MESSRS. ASTON WEBB AND INGRESS BELL have been appointed the architects for the new buildings about to be erected in Whitehall for the United Service Institution. Inigo Jones's banqueting hall, long used as a Chapel Royal, will be incorporated as the hall of the Institute, and the new buildings are to occupy the site adjoining, where the stables and mews are now in course of demolition. This work will greatly add to the architectural importance of one of the most important thoroughfares in London.

At last week's meeting of the London School Board, the Works Committee again presented a report recommending that competitive plans be invited for one of the new schools about to be built. In the report they stated that they considered the tenders accepted by the Board for schools lately planned very costly. They therefore recommended that they be instructed to prepare and submit to the board the conditions for a competition for the school proposed to be built in Priory-street, Bromley. General Moberley moved the adoption of this report, but discussion on the matter was postponed.

The architects of the Province of Quebec are complaining of the action of the Provincial Government in imposing upon them a professional tax, thus placing them on the same footing as lawyers and doctors, while at the same time refusing to their association the rights and privileges accorded to the other professions. They object, and with great reason, to being recognised as a profession for taxation purposes only.

In an interesting communication to *A.A. Notes* for November, Mr. Fred W. Marks, now in London, describes the progress that is being made by the Australian colonies. As to the prospects of architects, he says:—"Australia requires no more architects at present. There are upwards of 600 already practising there, while 100 or more are employed in Government offices; counting assistants and pupils, it is estimated that 2,000 persons are engaged in architectural work in these colonies (to say nothing of jerry builders)." The rates of wages are high, the average being: bricklayers, 11s. to 12s. per day; carpenters and joiners, 10s.; labourers, 7s. to 9s.; plasterers, 7s. to 11s.; plumbers, 10s. to 11s.; quarrymen, 10s. to 10s.; slaters and stonemasons each 10s. to 12s. daily.

A NEW method of brick manufacture, used in certain parts of Central Asia, was recently described to the Paris Academy of Sciences by M. Edouard Blanc. This mode of manufacture is practised by the tribes in Western Mongolia, on the frontier of Siberia. The extremes of temperature render a brick of great durability a necessity of life. This is attained by the use of steam. The oven is cylindrical, and surmounted by a hemispherical cap, which is kept open for the first three days. The bricks, about 7,000 at a time, are baked by means of a fire fed by about 7,000 kilos. of an annual ligneous plant, the *Alhagi camelorum*. On the third day the opening is closed with felt, which is kept constantly wetted, so that the bricks are inclosed in a steam bath, while kept at red heat. The bricks, red after the first period, appear dark grey after the second part of the process. Their structure is porous; they become sonorous, and acquire a great hardness. They show a striking resemblance to certain trachytes. Made from the same clay as our bricks, they are said to resist weathering very much better.

THE *Neue Freie Presse* of Vienna discusses the advantages and disadvantages which attend the electric lighting of St. Stephen's Cathedral, which has lately been introduced. From a practical point of view the lighting is all that could be hoped for. The twelve large hanging lamps, each 1,000 candle-light power, suffice to spread a brilliant light into every part of the great church. The light also brings out the details of decoration and of the architecture as it is never possible to see it under other conditions, because no other light is so equally distributed from the ceiling to the ground. But this may not be altogether an advantage, as an architect naturally arranges his parts with distinct reference to the distribution of light, as it is permitted to enter by the windows or dome. And as regards the building as a whole, its appearance is certainly not improved by the absence of due shade. What is here stated must

apply more or less to all large Gothic buildings. The fault lies not in the strength of the light, but in its position. It can never have the same effect as that got by the sun's rays entering through side windows, and it was with reference to such lights that Gothic cathedrals were built.

ACCORDING to the returns published by the French Minister of Public Works, the total length of navigable rivers and canals in France last year was 7,995 miles, of which 2,735 miles were rivers navigable by nature, 2,250 miles rivers which had been rendered navigable by dredging, and the rest canals. The total quantity of goods carried upon these waterways was 25,181,056 tons, or 1,013,713 tons more than in 1890, the increase in the traffic being much greater on the canals than on the rivers. More than 50 per cent. of the imports (2,125,407 tons) consist of combustibles brought from the coal-fields of Mons and Charleroi, while the exports (887,230 tons) are almost entirely composed of goods sent to Belgium.

An examination of candidates for certificates of registration from the Plumbers' Company was held on Saturday at the new Borough-road Polytechnic Institute. The examiners were Messrs. Charles Hudson (chairman), W. H. Webb and J. Knight (master plumbers), H. Hobbs (Battersea Lodge), G. E. Munn (East London Lodge), and R. A. Nurse (No. 1 Lodge), of the United Operative Plumbers' Association of Great Britain and Ireland; and Mr. C. T. Millis, M.I.M.E., principal of the educational department of the institute. In addition to undergoing a practical test, each candidate was required to answer a series of questions relating to the various materials used by plumbers and the general sanitary arrangements of a dwelling house. Of the 24 candidates who presented themselves, only three succeeded in passing the full examination. 54 students have joined the plumbing classes held at the institute since the opening of the classes on the 3rd inst.

A TRAMWAY recently established at Berne is worked on the compressed-air system, owing to the gradient being too stiff for horses to haul the cars. The cars are self-contained, and are on the Mekarski system, the compressed air being contained on the cars in reservoirs. Each car carries twelve reservoirs, ten of which are arranged on the underframe and two under the seats. These vessels, which contain air under a pressure of 600lb., are connected with one another and with the motor. The rails, which are of steel, are so profiled that they also form longitudinal sleepers, and the gauge of the line is 40in. A ten minutes' service of cars is made, and the speed ranges from 7½ to 9½ miles an hour.

MEETINGS FOR THE ENSUING WEEK

MONDAY.—Royal Institute of British Architects. Opening Address of the President, J. Macvicar Anderson. 8 p.m.

Society of Engineers. "The Use of Steel Needles in Driving a Tunnel at King's Cross," by W. H. Hottum. 7.30 p.m.

Liverpool Architectural Society. "Questions of the Hour," by T. Mel-lard Reade. 6.30 p.m.

TUESDAY.—Institution of Civil Engineers. Opening Meeting of Session. 8 p.m.

The Euclid-avenue Opera House, at Cleveland, Ohio, the finest theatre in that city, was destroyed by fire on Saturday. Scenery, costumes, and apparatus valued at £5,000 have been lost. The house itself was insured for £50,000.

The City Corporation Art Gallery was formally reopened last week on the completion of alterations, including the improvement of the lighting. Many of the pictures have been rearranged, and some of the more costly have been glazed. The valuable gift of the late ex-Sheriff Nissen, comprising 54 drawings of Old London Bridge, by E. W. Cooke, R.A., have been hung in the smaller gallery, and are now to be seen to greater advantage than was the case formerly.

The Vicar of Camberwell appeals for funds to complete the restoration of Sir Gilbert Scott's early success, St. Giles's parish church; the tower and spire of which were pronounced unsafe a year ago, owing to the perishable nature of the Caen stone used in construction. The restoration is being carried out, under the direction of Messrs. Newman and Newman, by Messrs. B. Colls and Sons, of Coleman-street, E.C., in three sections. Of these the first and second, for the spire were taken at £1,100 and £1,250 respectively, and are almost completed; while No. 3, for the tower, will cost £1,150.

Trade News.

WAGES MOVEMENTS.

DUNDEE.—The recent dispute between the plumbers' apprentices in attendance at the Dundee Technical Institute plumbing classes and the Technical Institute Committee has reached an acute stage. The plumbers protested against the apprentice tinsmiths being allowed to attend practical plumbing classes, it being considered that they were not entitled to avail themselves of the classes having regard to their want of training in workshops. On Friday night the class met as usual, when a communication was read from the Institute Committee, declining to restrict the classes. The plumbers afterwards met and decided to break off their connection from both theoretical and practical classes.

SALFORD.—At their October council meeting, the council passed a resolution on the motion of Councillor Huddart (labour) to the effect that "every corporation contract for the supply of any goods, or for work done, shall contain an undertaking on behalf of the contractor that all workpeople employed in connection with such contract shall be paid the standard rate of wages current in the district where the work is carried out; and in case of any violation of this undertaking, the contract shall be null and void, and the contractor liable for any loss caused thereby."

WORKING RULES FOR THE BUILDING TRADES OF LONDON.—The new code of working rules for the Metropolitan, agreed to in June last at the conference of the master builders and the representatives of all the trades concerned, comes into force on Monday next, the 7th inst., although by special arrangement the bricklayers have enjoyed the increased rate of pay since July. The plumbers will have a different set of rules to the other trades. The chief points are that for all trades, except plumbers, the working hours are 50 per week in the 38 weeks of summer, 44½ hours for eight weeks in the depth of winter, and 47 hours for the intervening three weeks between seasons in November and February. The rate of wages is advanced by ½d. an hour all round, and overtime is reckoned at time and a quarter till 8 p.m., time and a half from 8 till 10 p.m. and after that hour; and after 4 p.m. on Saturdays, and throughout Sunday at double time. For these trades the London district extends to a twelve-mile radius from Charing Cross. For plumbers the working hours are 47 hours in summer, 42 in mid-winter, 44½ hours in the first and last three weeks. The late rate of wages is advanced by ½d. per hour, but the "London district" in which the rules are in force is restricted to six miles from Charing Cross, and payment for overtime remains as before.

Two handsome stained-glass windows in memory of the late Archdeacon Balston, vicar of Bakewell, and formerly head master of Eton, which have been placed in the chancel of Bakewell Church, were dedicated on Friday afternoon by the Bishop of Southwell. The design represents the *Te Deum*, and the window has been erected at a cost of £600.

The building committee of the Olivet Chapel, Stanningley, near Leeds, have selected the plan of Mr. Hancock, Batley, for a new chapel. The plan provides for accommodation for 500 persons, and separate school buildings with equal accommodation. In the school there will be 16 classrooms, with gallery overhead. The premises will be substantially built of stone, and a tower will be placed over the entrance. The cost will be £3,000.

CHIPS.

The local board of Gorton, near Manchester, have adopted plans and estimates prepared by Mr. C. J. Lomax, the engineer for the sewerage of the district, at an estimated cost of £28,534.

Public baths are about to be erected at Castleford, Yorks, from plans by Mr. A. Hartley, architect.

A new hotel is in course of erection at Shooter's Hill West Cotes, at a cost of over £2,000. The architect is Mr. Tompkins, of Cotes.

A large party of Edinburgh builders and their friends visited Edinburgh Castle on Saturday afternoon, and were conducted over the historic buildings by Mr. Hippolyte J. Blanc, A.R.S.A., the architect of the restorations. In particular he traced the history of Parliament Hall and the Argyle Tower, pointed out the features of the restoration of these buildings, and the considerations which had guided him in the style of restoration adopted.

Alderman Simpson will be elected Mayor of Harrogate on Wednesday next. He is a native of the city, was born in the year 1824, and was apprenticed to the building trade, which he followed with success until his retirement a few years ago. In the year 1870 he was elected a member of the improvement commissioners, and since that time he has never ceased to serve the town in a public capacity. Perhaps his best work was the discovery of two valuable mineral springs in Low Harrogate, the yield of one of which is only second to the old sulphur spring.

Mr. F. H. Tulloch, A.M.I.C.E., a Local Government Board Inspector, held a public inquiry at Todmorden on Friday relative to the local board's application for sanction to borrow £4,000 for Walsden sewerage, £1,600 for improvements to the town hall, £1,000 for painting and decorating, and £600 for heating and ventilation. No opposition was offered.

The will of Mr. Ralph Ratcliff, late of Providence Villa, Harlington, Middlesex, brick manufacturer, who died on August 23, has been proved, the value of the personal estate amounting to upwards of £19,000.

At the last meeting of the town council of Manchester the mayor announced that he had received an intimation that a number of gentlemen intended to present to the corporation a portrait of John Bright, painted by Knight in 1847.

A new fire station is under course of erection by the London County Council on a site in Lordship-lane contiguous to the new park at Dulwich, and the memorial stone was laid on Monday. The design is by Mr. Thomas Blashill, superintending architect to the Council. Messrs. Stimson and Co., of Brompton, are the builders, their contract having been taken at £10,610. Accommodation will be provided for an engineer, nine married firemen, and a married coachman, with a steamer, a manual engine, a hose-cart, four escapes, and two horses.

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TENDERS.

* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

COWES, I.W.—For the repair of the sea-wall for the East Cowes Local Board:—
Thomas (accepted) £43 15 0

GLASGOW.—For Glasgow sewerage:—
Contract No. 1:—
Johnson, S., Manchester £7,769 0 9
Hopkinson, R., Halifax 6,377 12 1
Kellett, E., Bradford 6,041 8 8
Brayshaw and Horrocks, Burnley 5,800 11 8
Atkinson, T. E., Cross Hills 5,565 0 6
Parkinson and Bower, Halifax 5,208 17 4
Taylor, G., Blackburn 5,180 12 7
Bell, G., Tottenham 5,171 17 2
Townsend and Watson, Sheffield 4,991 7 4
Kirk, B., Skipton 4,972 12 8
Tomlinson, R., Keighley 4,945 7 2
Sharples, J., Accrington 4,764 19 10
Wilson, H., Bradford 4,648 2 0
Crabtree Bros., Oxenhope 4,641 6 4
Birkby, H., and Sons, Wyke 4,577 7 8
Young, J. and T., Baildon 4,465 18 2
Waddington Bros. and Holmes, Oxenhope 4,462 11 1
Escolme, R., Morecambe 3,948 13 0
Kelk, J., and Co., Keighley* 3,702 16 6½
* Accepted.

Contract No. 2:—
Thornton and Crebbin, Bradford £922 19 2
Towler, W., Leeds 733 8 0
Sharpe and Co., Lancaster 698 16 0
Lees, J., and Son, Gomersal 686 18 0
Clapham Brothers, Keighley 649 5 1
Blakeborough, J., and Sons, Brighouse (accepted) 645 9 9

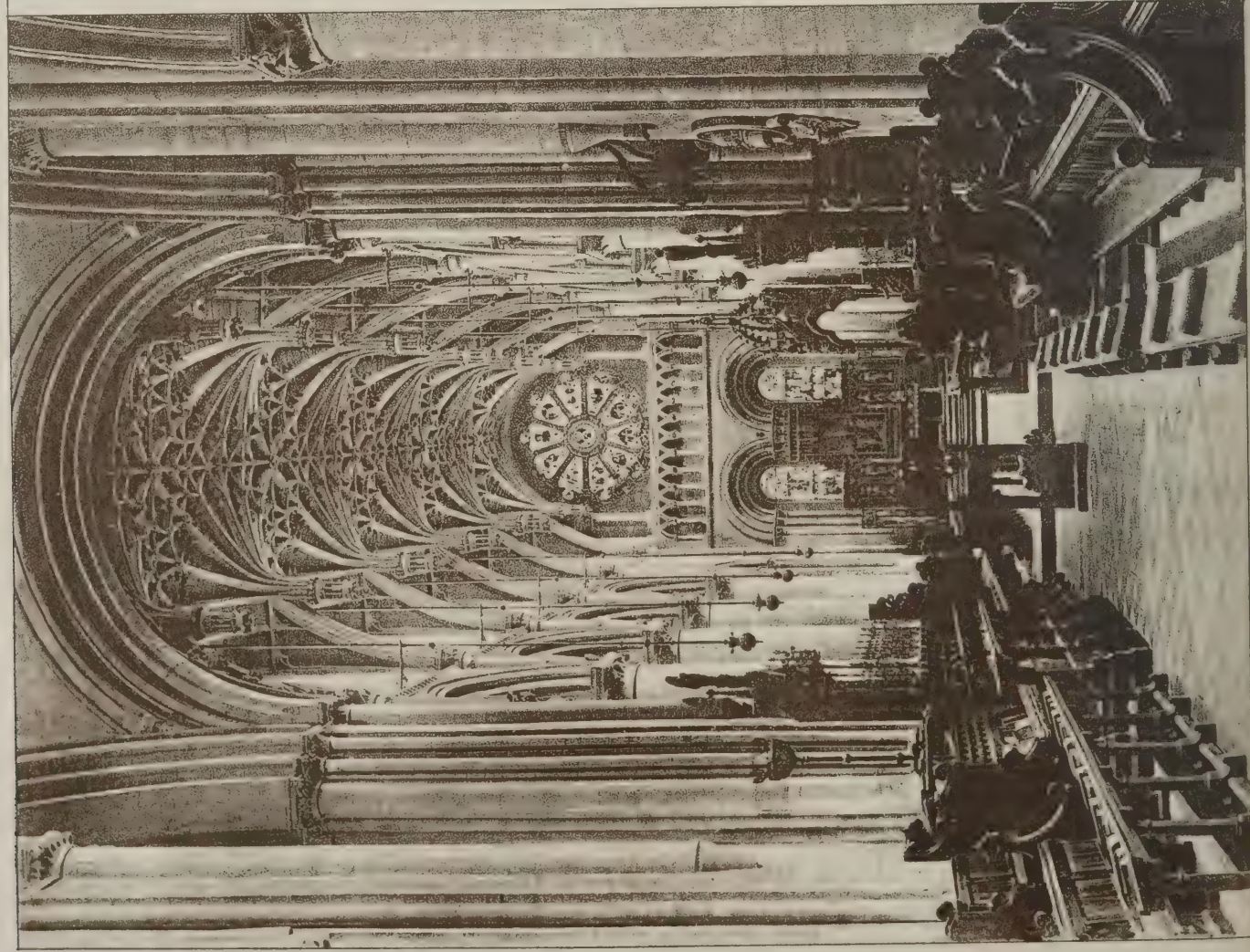
ZINC ROOFING. COPPER ROOFING.

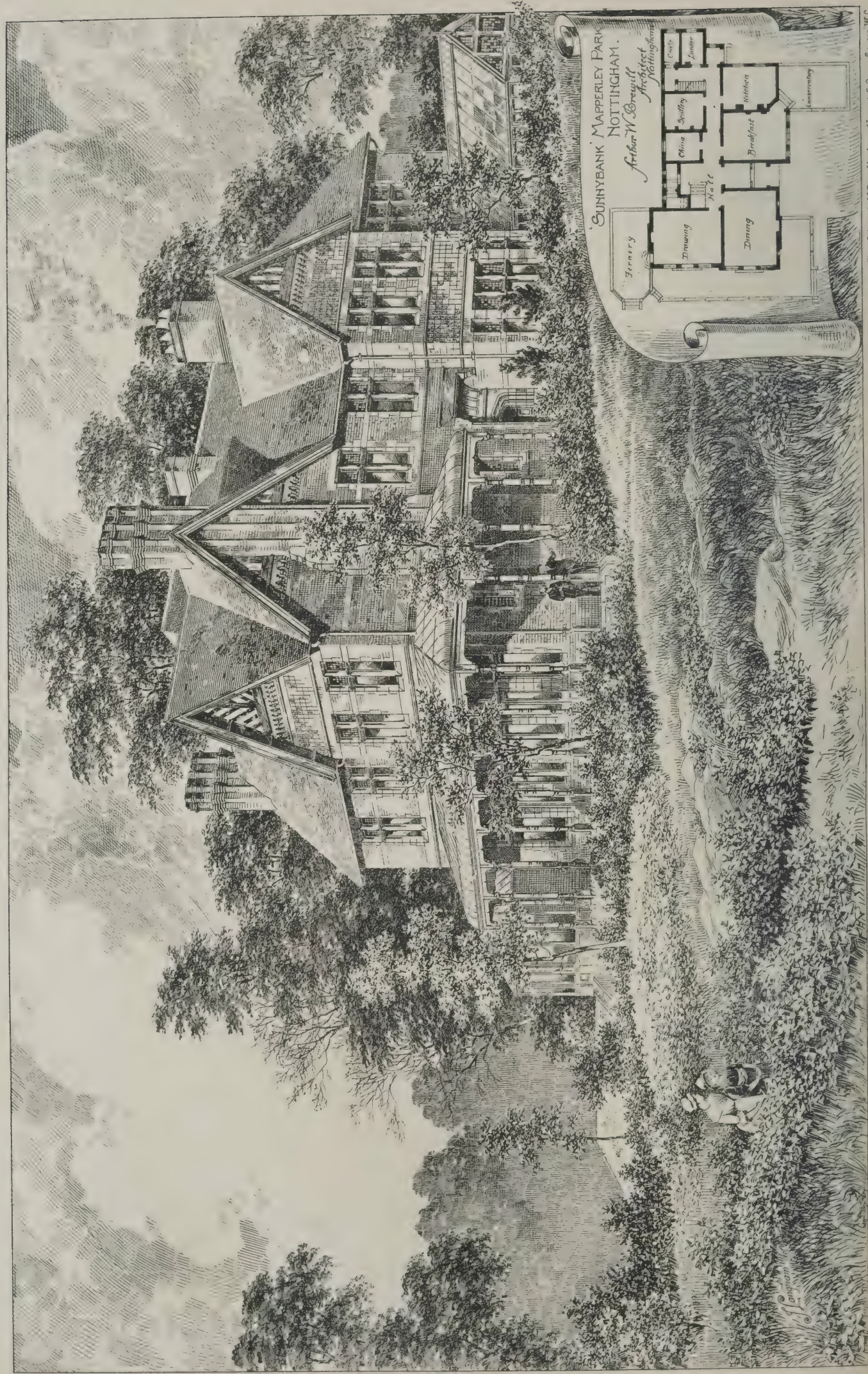
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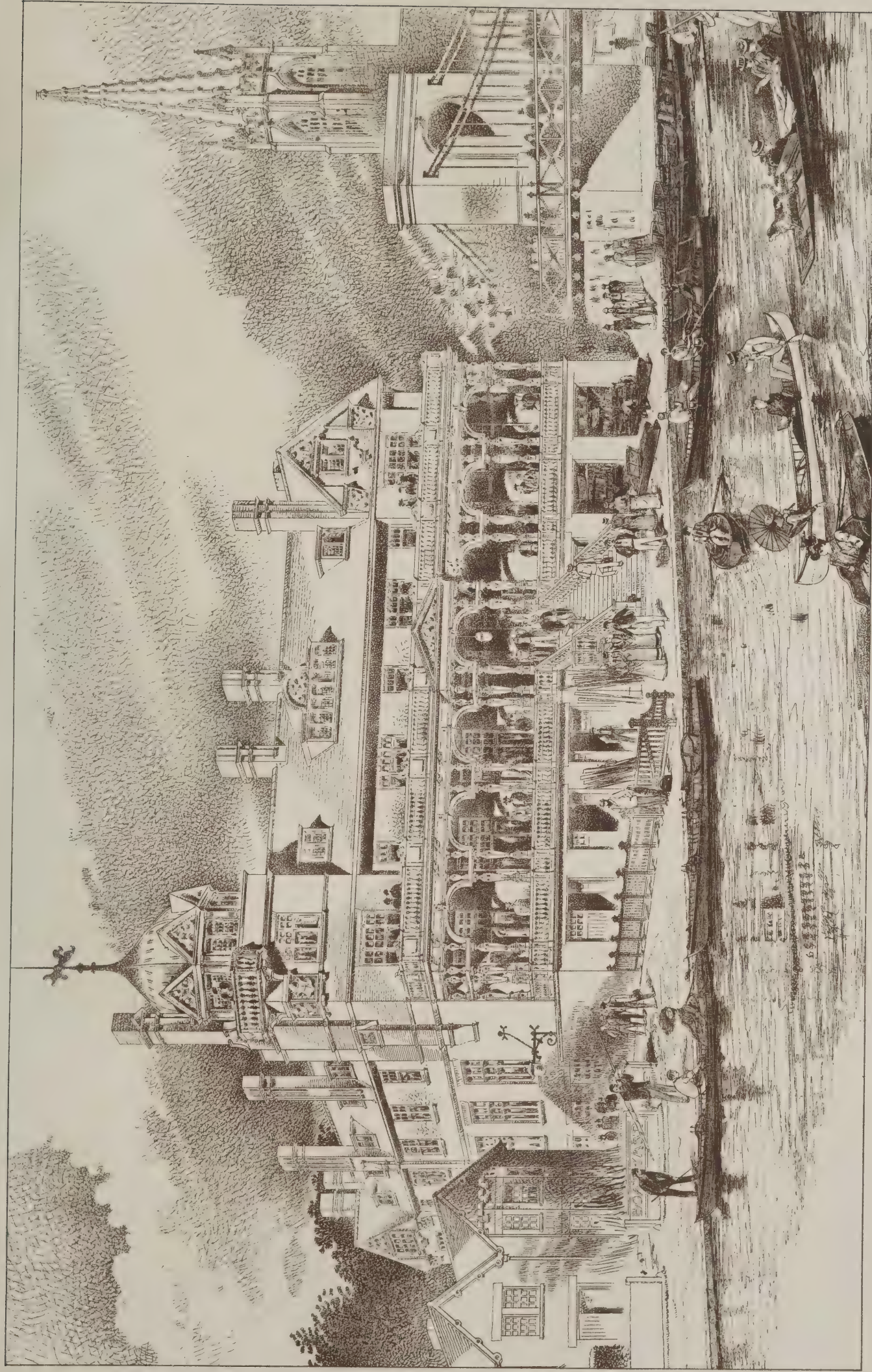


Schools at Hove.
Messrs Lainson & Son,
Architects, Brighton.



GROUND PLAN





Photographed & Printed by James Alcock & Co. 6, Queen Square, W.

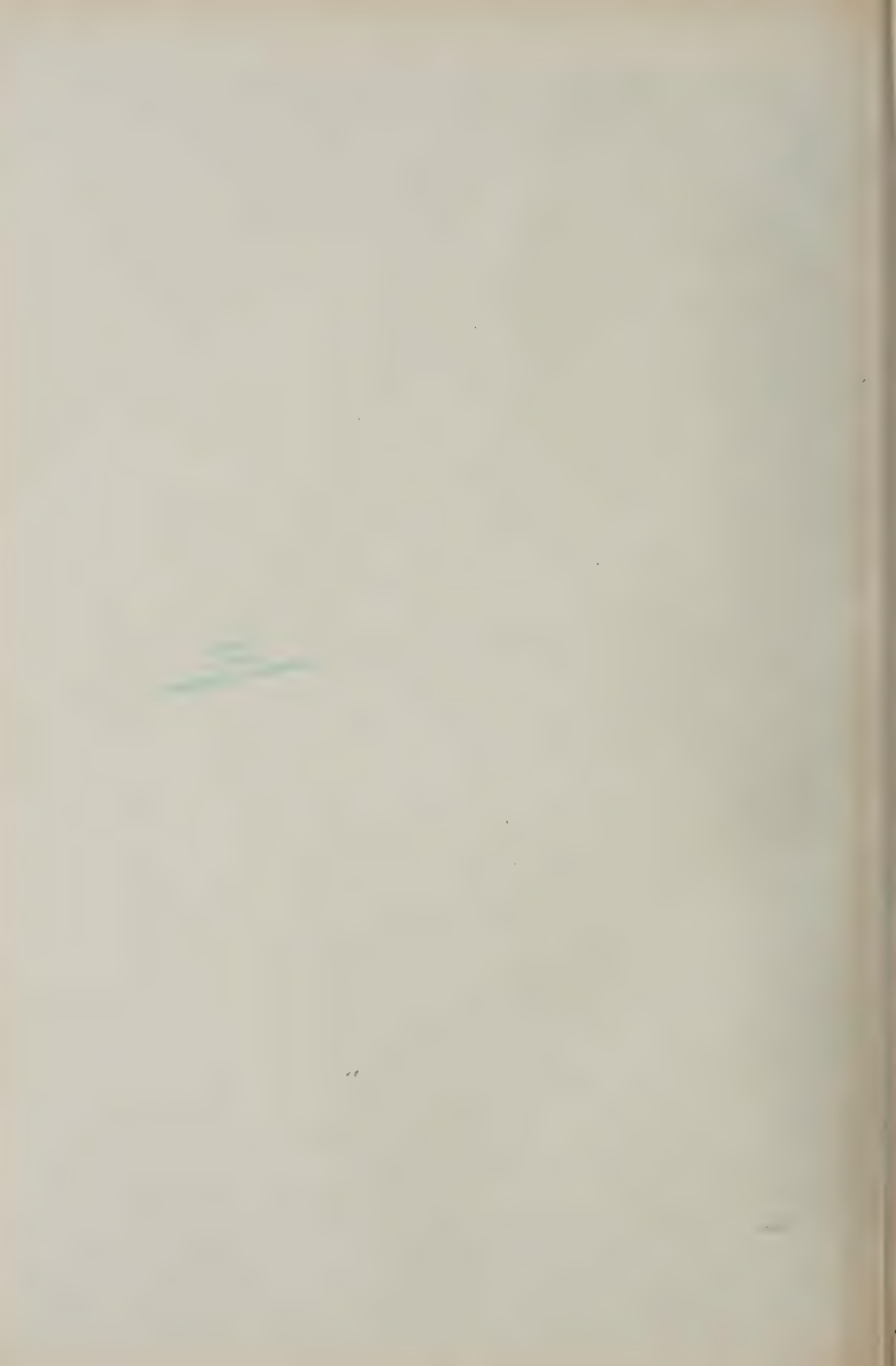
THE BUILDING PEWS, BOX 4, 1892.

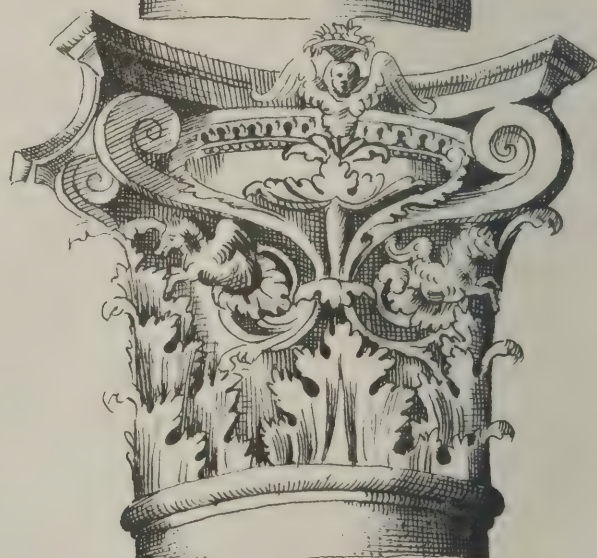
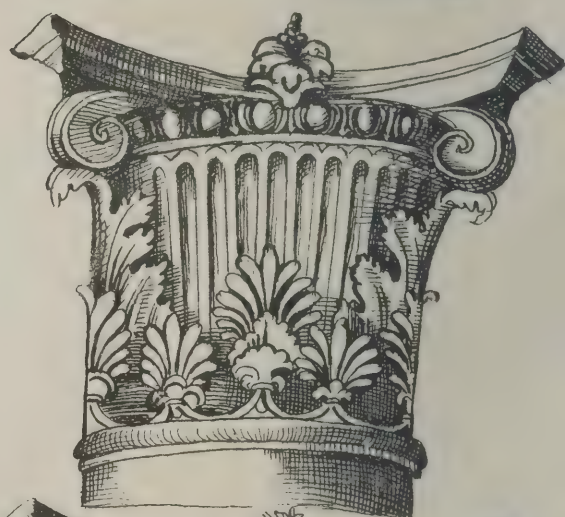
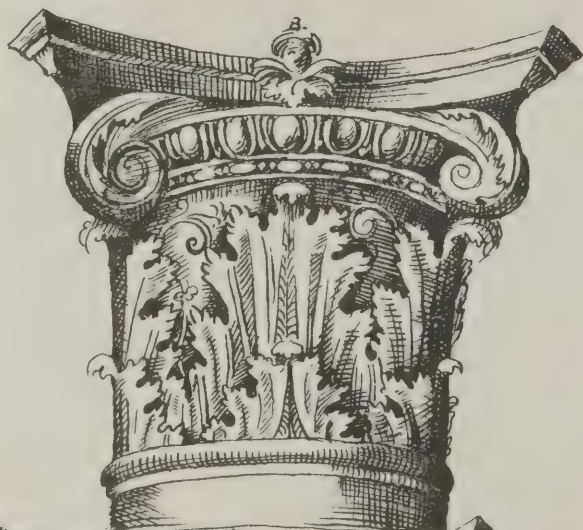
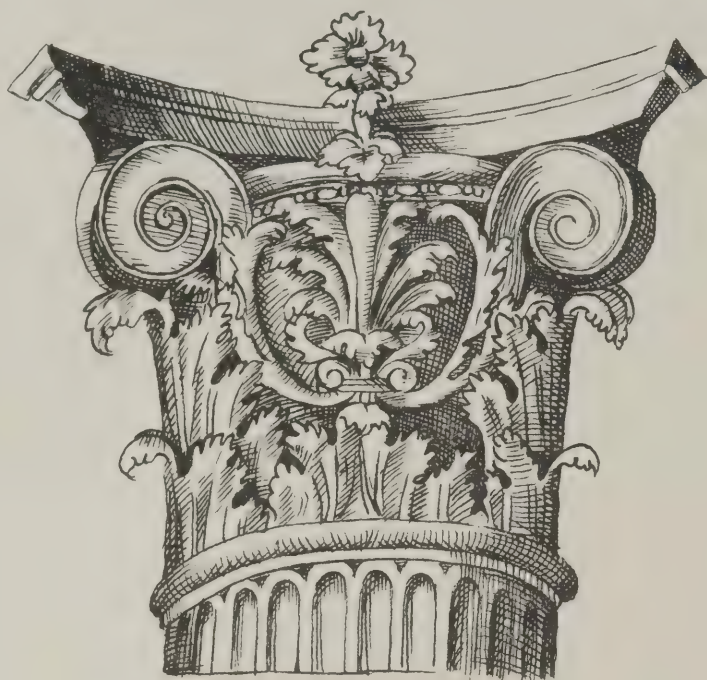


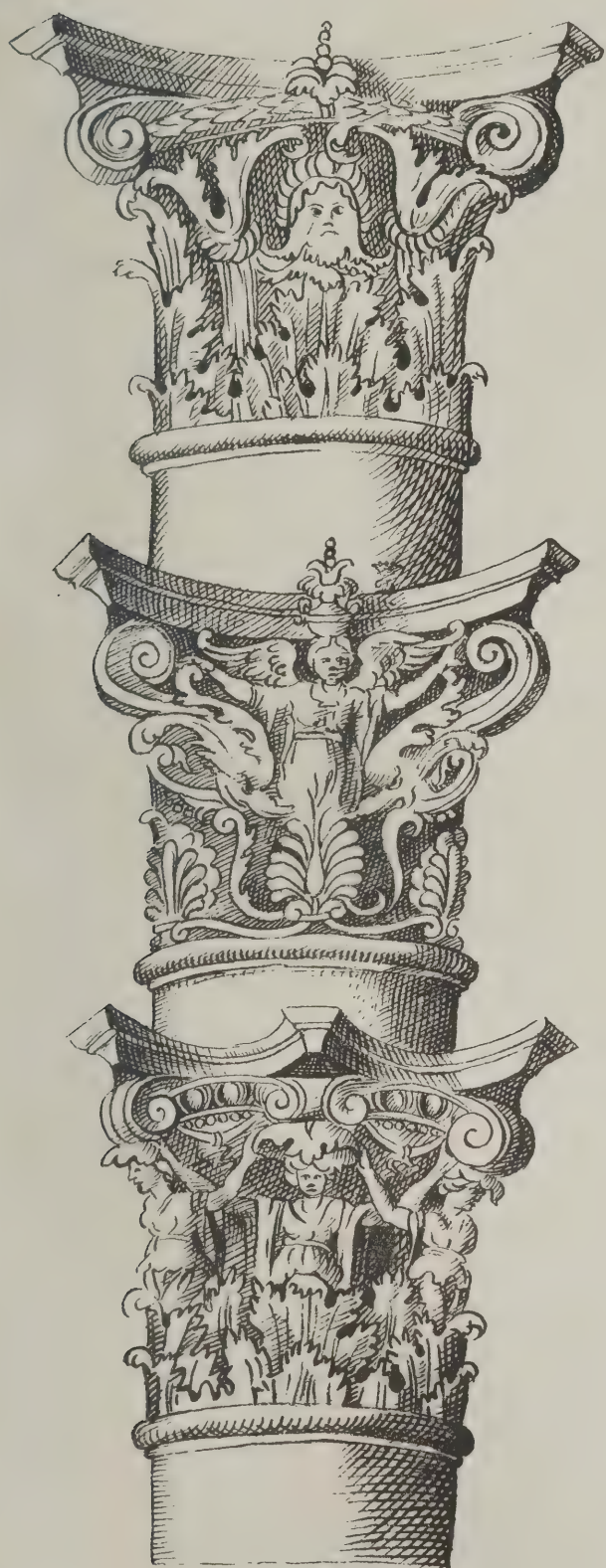


PHOTO-TINT, by James Akerman, 3 Queen Square, London, W.

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ORIGINAL DRAWINGS BY INIGO JONES RECENTLY EXHIBITED AT THE R.I.B.A.
LENT FROM THE CHATSWORTH COLLECTION BY HIS GRACE THE DUKE OF DEVONSHIRE.

THE BUILDING NEWS

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ARCHITECTURAL "SURVIVALS."

A "SURVIVAL," in the language of modern science, is something which once had a use, and which Nature still continues to produce, although its use has ceased. Survivals are common amongst both animals and plants. Both of them, in numerous cases, retain features which, from a utilitarian point of view, are out of date. The time was when these features, of whatever sort, were invaluable to their possessors. But the conditions of life have changed; they are serviceable no longer, and yet, in spite of this, they show themselves still in generation after generation. Survivalism is common in nature; but it is still commoner in art, and of all arts, it is most common in our own. Theorists have written against it; enthusiasts have tried to dispense with it; but the fact remains that architecture, especially in Europe, has always been made up very largely of survivals.

It is well for the architect to have a lofty ideal of perfection. "Who aims at the sun shoots higher far than he who means a tree." We shall not quarrel, therefore, with the writers who assert that a building ought to derive all its beauty from the skilful treatment of its essential parts, and that, with the exception of sculpture and pure decoration, it should admit no details except those which spring inevitably from its purpose and its construction. Such a building, if beautiful, would certainly be above criticism. The difficulty is, that to produce it almost exceeds human powers. An architecture with no survivalism in it is a thing which Western artists, from the Greeks downwards, have never attained, and which, if we ever get knowledge enough to speak positively, we may perhaps find to have been equally beyond the reach of builders in the East. On a superficial view, however, it does seem as if the earlier Mohammedan architects—for instance, in Cairo—had come nearer to the theorists' ideal than either we or our forefathers. In the main, though not altogether, their apparent construction is also the real one; their ornament usually, though not always, is purely decorative. It may be a far-off suggestion of natural forms, it may be an original invention of beautiful patterns; but, with two or three obvious exceptions, it is not an imitation of human work. In this, to a large extent, lies the difference between the Eastern and Western Pointed styles—the Saracenic art and Gothic art. *A priori*, the former would seem most in the right, and yet how shallow, how frivolous, how superficial, is it compared with the latter!

We are most of us so busy in trying to produce art of some kind, and, if we are wise, we are seeking to produce it so much more by imagination and perception than by processes of reasoning, that few of us, perhaps, realise how much survivalism there is in our favourite styles. We need scarcely refer to the Greek Orders, with the numerous points which show their descent from wooden types of construction. The survivalism there has struck everybody. In Roman architecture it is even more conspicuous, though in a different way. The architrave and its frieze, the great stone beams or lintels which run from column to column, and supported the roof or the pediment, were, of course, the very essence of the construction in a Greek temple. It was these that really did the work and carried the weight, and it was not wonderful that they became a prominent feature. But when the Romans took up and

somewhat modified the three orders, they adopted, in many cases, the arch along with them. It was then the arch and not the lintel which became the important thing for practical purposes. The architrave and frieze were wanted no longer. Yet they survived. They were retained, though useless. The arch, which really kept the building up, was made, in appearance, a trivial and secondary matter, while the effete entablature lasted on in all its glory, and took the credit of the whole proceeding. It is the way of the world. They manage it so in "church, army, physic, law," as well as in architecture.

In the Post-Roman styles, the Romanesque and Lancet Gothic, this particular piece of survivalism went out of fashion. For a time, indeed, it was thought necessary to put a fraction of entablature above the capital of each column, even after the arch had asserted its own importance, and stepped into its rightful place. Modern copies of these curious bits of entablature may be seen inside some of Wren's churches, and in that of St. Martin's-in-the-Fields. Ancient modifications of them remain in the double capitals at St. Vital, Ravenna, and in other Byzantine churches. By degrees, however, the arched styles shook themselves free, not of survivalism itself, but simply of discordant survivals from earlier times. The architrave was abandoned, the frieze and the cornice grew smaller and smaller. Now, however, came in survivals of a different variety—a variety not unknown in Classic times, but unlike that which has been above referred to. Hitherto we have been speaking of the retention of structural features whose practical purpose has passed away. Now we come, in addition, to the imitation of structural features where they do not really exist. In strictness, this can hardly be called survivalism, and yet it is so closely allied to it, and so inseparably mixed up with it, that the two things cannot easily be separated. For want of a better name, it might be called *quasi-structuralism*. It is that copying of human work which Mr. Ruskin was once wont to anathematise as the sure mark of a decadent period. Every period, however—the best as well as the worst—is full of it. In Romanesque and Early Gothic the *quasi-structuralism* lies mainly in imitations of arches and columns. The walls are covered with arcades, whose arches rest on capitals, and these, apparently, on shafts. Really, they do no such thing. Whatever weight is above the arcade is carried either by the bonding of the arch-stones into the wall—so that they act, not as *voussoirs*, but as corbels—or, if they are insufficiently bonded, by the bonding-in of the capital itself. The shaft and its base really do nothing. They may be removed—nay, in hundreds of cases they have been removed—without the slightest injury to the work above. If "practicable" columns, actually supporting a weight, had gone out of fashion before these formal ones were used, we should naturally call the latter a survival. But as both sorts were used concurrently, we may call them an example of *quasi-structuralism*.

Things of this sort are not necessarily a sham. When a cornice has beneath it a range of dentils, each dentil is probably a survival, or an imitation of some primitive corbel. By shape and by association the corbel gives the idea of support, and without asking whether support in the present instance is actually given, we feel instinctively that the dentil course has the kind of tone and expression which suits the place. Towards the end of the 13th century the *quasi-structural* column became rarer, and other things of the same class took its place. Window tracery, which had been developed to support the glazing, was imitated on wall surfaces. Buttresses, which had been designed to hold up the vaulting, were copied in miniature on screens, and fonts, and

woodwork. The vaulting itself, on an almost microscopic scale, filled the heads of niches and similar features, where it was certainly, from its smallness, neither a sham nor a deception. And battlements, again, grown out of date as a defence to fortified buildings, lasted on as a survival in almost every belfry-tower. We need not continue the list. Whoever cares to lengthen it will find undoubted survivals in plenty wherever, from the days of the Greeks to our own, he may care to look for them. And as for *quasi-structuralism*, the insertion of structural forms where their practical use is absent, it is so universal that architecture seems hardly able to exist without it. Shall we say, then, that our art has always gone on the wrong lines? Shall we condemn every feature that lingers when its material purpose has passed away? Undoubtedly yes, if mechanical perfection is all we care for. Assuredly no, if we look for anything higher. Most things that are lovely are survivals. Their physical usefulness is gone, their spiritual beauty has come. Begun for common purposes which relate to the body, they last on for nobler ends in the elevation of the mind.

FULL OR SHORT SPECIFICATIONS.

WHETHER specifications should be short or long is a question that has lately been debated by a colonial society, and has often given rise to some doubt in the minds of architects generally. Elaborate and precise directions may, and often do, turn out two-edged instruments, and, like long letters on business matters, may become troublesome to the writer in committing him to statements he had wished he had never made. A long and detailed description of what a material or fitting or an apparatus ought to be ties the writer or architect to every item of it, for if he relaxes or slackens his demands, he opens himself to being called to account for any defect that may appear in the work, and if he exacts compliance with the letter of his specification he may, unless he is very careful and experienced, find that he has overreached himself by requiring some conditions that are absolutely detrimental and unnecessary. We have known young architects who have thus out-Heroded Herod, and have left to themselves no loophole of escape by an over-anxiety to appear clever in their demands. Many a contractor or clerk of works can tell of amusing instances of this kind of over-specifying—of requiring, for instance, concrete to be well rammed in layers, instead of thrown in, the effect of which is to make the cementing medium come up to the top—of being over-particular in the size and shape of bricks at the expense of imperfect burning; of minutely describing a bond which gives an imperfect longitudinal tie; of insisting on timber of a certain quality without specifying a certain brand, or, what is more frequent, timber from a particular port is specified, without any reference to the qualities. By his eagerness to detail minutely the brand or the make, he unwittingly exposes himself to the tricks of the trade. In timber, for example, the particular quality specified as the best may be inferior to a second quality, and unless the mode of cutting is known, few can distinguish Swedish from Russian goods. Hence a specification which provides for Russian goods of a certain quality may exclude a sounder and more evenly grained Swedish timber, and such has been the experience of those capable of judging.

Excessively detailed specifications often miss the real mark or intention of the architect; in the mass of verbiage the point of the whole is lost. Thus, a specification clause may give full scantlings of a roof truss, and yet omit to explain how the joints are to be

framed. Of course, the working drawings are to be referred to for many of these details, and therefore it is most important to explain those points, such as qualities of timber and iron, mode of framing, and other things which are not shown in the drawings. In stonework a good deal has to be explained relating to the beds of stone, average heights of stones, &c.; also as to dowelling, the material of the dowels; the running with lead of cramps; and in every branch of workmanship specific directions are more necessary than a number of general expressions which have no definite meaning, such as "provide and fix in a proper manner," or as "approved"; or details already shown in the drawings. In fact, if the specification were more explanatory and less descriptive, it would often be a better and surer guide than it is. Here we take a specification up, and find an unnecessary long preamble about the timber; that it is to be of the "best description" from "Memel or Riga or Dantzic," free from "sap shakes, large, loose, or dead knots," but not a word said about such timber to be sawn into scantlings immediately after the contract is signed. Again, to say "the ironmongery is to be of the best quality" is of no value, as every contractor puts his own idea of such an expression in his tender. The quantity surveyor's idea of specification writing is not necessarily the one to be followed, as it is generally only a repetition of the quantities, and, in point of fact, has been made up or compiled from the bill, instead of being written first. The consequence no doubt is brevity of a certain kind, but we cannot say the document is worth much. No doubt a certain amount of precision and brevity is the result of the training of the quantity surveyor; he follows a system, he takes each trade floor by floor, and begins from the beginning; he writes a preamble or preliminary clauses in which the conditions of each trade are set forth, the general directions, their details or items following the abstracts of the bill; but this leads us to the opinion that even in too great brevity there may be as much danger as too great an amplification. An easy way of writing specifications is that of commencing with descriptions of the materials, and going through the items as they appear in the dimension book.

But there is no royal road: all that we insist on is that a long clause, amplified for the sake of spinning out the specification, may recoil on the head of the writer. It must be pointed out, too, that much elaboration and minuteness ought to be followed by a corresponding fulness of supervision, for if the architect has no means of insuring that every item is strictly carried out, some busy-body or client may remind him of the shortcoming, and his own reputation for careful supervision be endangered. In some cases even his pocket may suffer from a too-anxious desire to specify items that are not absolutely necessary.

To take another instance of unnecessary detail in specifications, we often find very minute particulars given of sanitary fittings—say, a w.c. apparatus; but, from want of knowledge or experience, the writer puts himself out of court by attempting too much, as in specifying a high-priced mechanical valve apparatus, where a good wash-down type would have been preferable. Again, old-fashioned appliances, like valve cisterns of the treadle or seat action valve kind, are sometimes specified, instead of a good form of siphon flusher. Where water is scarce, a good valve-closet may be better than one of the siphon kind; but when quick-acting flushing cisterns are to be obtained, there is no advantage in specifying the more complex apparatus. In these cases an architect is more likely to get what he wants by specifying a certain type, as an "approved wash-down pedestal basin" as "Twyford's

Deluge," Doulton's or Adams' and Co.'s patent siphon cistern.

We may also study too much brevity, and this is probably the commoner evil of the two. A mere list, and often a very imperfect one, is found to do duty very often—in fact, it may be a list of items taken from the quantities. Prefixed to each is the ever-recurring injunction, "Provide and fix in a proper manner." In a late discussion, one of the speakers said he believed in making specifications as short as possible. No doubt, if it could be done with care and precision—care not to omit any necessary direction or item, and with a thorough knowledge of what constitutes good workmanship. One suggestion that has been made is that, instead of an amplified specification, $\frac{1}{16}$ in. scale detail drawings "be prepared of every part of the building which cannot be described or specified in simple language and few words." Contractors would understand it better than a long specification. No doubt they would, and the architect can express in a few lines his ideas better than he could verbally describe, especially the style of work intended and the construction proposed. The objections entertained by architects to supply numerous detail drawings, are that they often lead contractors to increase their tenders, and that in case of abandonment of the work they would be all thrown away and their labour would be lost. Further, the specification affords a convenient means of completing the architect's design without committing himself to details that might not be suitable, and, in fact, the same objection may be raised against amplifying drawings or making them minute, as against detailed specifications.

We do not see, however, why specifications should not be more amply illustrated by marginal sketches. Many a descriptions of stonework, carpenters' and joiners' work, and other trades could be made quite clear by a sketch or diagram. Take, for instance, roof-framing: any particular joint or connection might be simplified by a sketch, which would render a lengthened explanation unnecessary. A piece of framing or the kind of moulding is at once grasped by a sketch, however rough it may be, and would prevent the affixing of a fictitious price in the tender. Unfortunately, the indefinite and verbose description encourages the habit of making guesses either in excess of what is required, or a great deal below the mark. A vague specification of a staircase may, for example, mean a considerable difference in the amount of tenders. Hence, while elaboration and minuteness of description ought to be avoided as tending to implicate the architect, and likely to be used against him, on the other hand, vagueness and commonplaces can be of little practical use whatever. No doubt the primary object of such a document is to explain those details of a building or its construction that cannot be clearly illustrated by the drawings, to specify, define materials or scantlings, and modes of execution; and for this reason it should be prepared by the architect himself, and not left to an assistant, who, by the aid of an old specification, manages to draft what is required. The subject is one that the architectural societies may take up with advantage, and it may be worth while to award prizes to students for compositions of this class, to be founded, of course, upon actual designs.

ARCHITECTURAL ASSOCIATION.

THE second meeting for the present session of the Association was held on Friday evening, the President, Mr. H. O. Cresswell, in the chair. The following 48 members were elected:—F. S. Short, H. H. Skipper, Cyril Power, T. F. Green, G. H. Smith, G. P. Sheridan, W. H. Barrett, A. E. Gardner, F. E. Morris, A. H. Allan, S. P. Brinson, J. S. Lee, P. E. Stenning, E. G. Page, A. Stedman, A. F. J. Cox, C. A. J. Shar-

man, A. J. Gurney, T. E. Abbott, P. G. Redgrave, B. Hoole, J. H. W. Lake, R. S. Y. Fowler, A. G. Bewes, T. Wallis, F. Lishman, M. G. Pechell, P. Morris, W. H. May, G. O. Scorer, P. Sherrin, M. F. W. Bunney, A. B. Hayward, C. R. Hicks, E. Wheeler, W. J. Waghorne, J. E. C. Shield, J. P. Bishop, G. B. Hoole, C. D. Gruchy, S. Perkins, A. E. Dainton, A. W. Pocock, J. H. Coram, J. L. Walker, F. C. Simpson, E. C. Nisbet, and H. E. Y. Haggard.

NOTES ON THE APPLICATION OF ARCHITECTURAL EDUCATION.

A paper on this subject was read by MR. WILLIAM YOUNG, F.R.I.B.A., of London and Glasgow, who mentioned that hitherto he had uniformly declined all invitations to lecture, but could not refuse the request of the secretaries of the Association. When I read over your curriculum for the present session, I was impressed, he remarked, with its comprehensiveness. I thought of the time just past when every architectural student had to work out his education in his own way, and I wondered how men like Wren and Inigo Jones acquired their architectural education, without even the aid of the splendid architectural libraries now at our service, and with very little instruction in drawing. The student now has his course mapped out for him, and facilities are given him which were never within the reach of students of architecture before. Great credit is due to this Association for this good work. You have given us, or are giving us, the training and the knowledge, the art and the power, whatever you like to call it, to design buildings, make plans, and write specifications. But the difficulty of realising our designs in brick and stone remains undiminished. The most difficult period in an architect's career is when a young architect begins to turn his education into practice. Remember, I only say it is difficult, not an insurmountable difficulty. Indeed, some of you may get over it as easily as you passed over the *pons asinorum*. Some of you may be born into the way of practice, some may be thrust into it by kind friends; but with zeal and energy all of you may forge your way into it. An architect's education is never complete. For every true architect, his education is always going on, and that is what gives the man who has been a long time in practice, and done a lot of work, such an immense advantage. He has an education which only comes by doing much work. It cannot be got in any other way. When you begin to practise you will find the advantage of the education you are receiving here. Have your mind well stored with knowledge, you can make use of it all in the practice of architecture. Know something of everything, and everything of something. That is the ideal education for an architect. But don't lose sight of this fact, that after all education is only the tools with which you are to work. And we judge a man by his work, and not by the tools with which he does it. And it is not the tools you possess, nor any ornamentation in the way of letters after your name, no matter what those letters are, that will make your position as an architect. It is not even reading papers, or giving lectures, or taking part in discussions, or writing letters to the papers that will make your position as an architect. No; it is your work, and your work alone. As a good tree is known by its fruit, so a good architect is known by his work, and by his work only. At the commencement of a career, many of you may look to competitions as one way of applying your education. Many young men beginning their career as architects regard a competition as a short cut to success. That idea, let me tell you, is all romance. It would do very well for a novel. An author, if he should happen to make his hero a young architect, would probably make him enter some large competition, for some great public building, and he would get the first premium awarded to his hero, making his design far and away above all the others, leaving the older architects nowhere, but filling them with surprise and envy at the splendid achievement of the youthful hero. No doubt this would go down in a story-book; but that novelist would not be a realist. His picture would not be true to life. No, there is no such thing in the real life of an architect as jumping at one bound to the top of the tree; as in everything else, there must be time for growth. So your probabilities of success in

competitions will be much greater after you have had two or three years' experience in carrying out buildings; your designs will then take a practicable and realisable form that they would not have without this experience. Although I am not a believer in competitions, they are an established custom, for the present, which we have to face, and I am not going to say anything that would discourage you from competing. But let me say, I believe you might count all the men who have made a position for themselves by competition on your fingers. Few have gained by them, and architects, as a body, have lost by them. Look for a moment at a competition from a financial point of view. Let us take one for a building to cost, say, £20,000; twenty-five designs are sent in, and probably a good many more begun and not sent in. Each design would have about ten drawings, and you may put down the minimum out-of-pocket expenses at £40. Take 40 by 25, and you will find the twenty-five competing architects have spent £1,000 in order that one of them may earn a commission of £1,000. It is not as if the successful architect took the £1,000 for the competition drawings. No, he has still to make all the working drawings, &c., to earn his commission just as if there had been no competition. A commercial man would say: This may be art or it may be profession; but it is not good business. But there is a much more serious objection to competition, which is this: After you have taken every possible pains, and expended skill and labour, not to mention money, and really have produced a design of high merit, you have to face this fact:—That in competitions generally the gate of success seldom swings on the hinges of merit. It is a startling statement to make; but it is a fact. It is for this reason, amongst others, that my advice to you is this: Put not your trust in competition, for the ways thereof are dark and doubtful. Use them, if you will, but only as an extra string to your bow, if you use them at all. If you will compete, use great discretion as to the competitions you go in for. Don't attempt a subject you have no experience in; wait until there is one you understand. The planning of many classes of buildings, such as hospitals, lunatic asylums, and workhouses, is the result of a development by specialists, and you could not make yourself thoroughly acquainted with the subject in the time allowed. Don't attempt too much or too many, and stick in the middle. I have known many promising young men who were always beginning things and completing nothing—they were failures on that account. It is a wholesome rule to complete anything you put your hand to—try it, and you will find out its value. Don't give all your thoughts to the elevations to the neglect of the plans. Be strong in your planning if you mean to win. Don't send in scamped and anyhow kind of drawings for the plans and sections, and beautiful drawings for the elevations. Don't compete where the conditions are mean or unfair, and avoid all competitions which announce three premiums, and in a little note at the end inform you the first premium will merge in the commission; as a matter of fact, it is only two premiums, not three, and the promoters should honestly say so. Some committees think that architects will accept any conditions they choose to impose on them. If architects were united, as they should be, all this would soon be changed. Don't make a design that would cost double the sum stated; an assessor is bound to throw it out. In short, prepare your design and your drawings as if you were going to be saddled with the responsibility of carrying out the work. One of the best things to know about competitions is to know when to avoid them. On the morning after the result of every competition is made known, there are many men sorry for having competed. Perhaps sorry would be too mild a word to express the feelings of some of them after they see the accepted design; but if you were to poll the country over, you would probably not find one man who was sorry for not having taken part in the competition. The most interesting individual for you when you commence practice is a client. There are two classes of clients—the private individual and a public body, represented to you by a committee. There are, of course, infinite varieties of both, but they both require management, in the sense of understanding them and their wants (for what they want and what they ask for are often two different things), so as to be able to guide them and get on with them, some-

times a very difficult and delicate thing to do, and requiring a great deal of judgment and sometimes much patience. It is a simple enough thing to do when you know how, but as the way of doing it is not taught in the classes, you will only come by it by experience. Some men have the gift intuitively. Some never acquire it, and, in consequence, instead of going on smoothly and pleasantly with their clients, and becoming friends, it is all the other way—disagreement and differences and dissatisfactions. On such terms the game is not worth the candle. The great thing is to get your client's entire confidence, and the comprehensive education you are pursuing here will help you, in a large measure, to this end. For clients ask all kinds of questions, on every conceivable subject, and you are expected to be able to answer at once. If you cannot, they think that you are not so well informed as you ought to be. You will find that some amount of foreign travel, and a personal acquaintance with some of the principal buildings in Europe, both ancient and modern, and also of these in our own country, will be of much service to you in gaining your client's confidence, and immense service to you in your work. This necessity of having your client's confidence and being able to manage him, or, in other words, advise and guide him, is the more necessary, for you will find in many instances, probably in most, if you want to carry out good work it is not enough to be able to prepare good designs. You will also have to persuade your client to let you carry them out unmitigated. If you have a special feature in your design—one on which you pride yourself for its originality and go, it is almost sure to be objected to on the score of expense, or simply because it is original, and they don't like it; and it will depend on your judgment and tact to bring your client round to your views. A good many buildings are ruined and good designs spoilt by the architect having to give way to his client. Committees, I was once told, are the most difficult clients to get on with; my experience is all the other way, I think they are excellent clients to get on with. But you will require some acquaintance with the rules of procedure in committee. This is important for you to learn, for committees are strict as to rules of procedure. See that everything decided upon is put in the minutes, and have a copy of every minute sent to you. If the work you are engaged on takes a long time, the committee at the end may be entirely changed from the one you started with, and you may be the only one left who knows what has taken place; and your acquaintance with the minutes, &c., will keep them right. They will look to you to do so. If you do not get on with your committee, you will have a bad time, for then comes in the truth of the saying that "a committee has no soul to be saved." Avoid making speeches in committee—they look upon that as their prerogative. Say what you have to say in a few words. Be always in touch with the chairman; he has usually a great influence over the other members, and is expected to know everything. Don't take a committee by surprise. If you want anything important—an extra £20,000 or so—don't throw the request like a brick at their heads. Talk things over first with the chairman and two or three others. You will find that most important business in committee is pretty well agreed upon before it comes formally before the meeting. If your committee take a wrong view of a matter, or are likely to divide in place of being unanimous, get the matter put off until another day—what you want will then probably come all right. Committees have immense powers, and when they once come to a decision it is almost impossible to get them to alter it. With committees, as with private individuals, you will find that with a little tact, and being always straightforward and open, and especially being yourself strong—with sound reason and clear—as to what you want to do, you will generally succeed in leading your client to do what he ought to do—or, rather, to let you do what should be done. But if you are undecided yourself, have not fully made up your mind, if you are vacillating and uncertain, then depend upon it your client will often make you do things that will be no credit to you and be no satisfaction to him, and they will blame you for it. And, by the way, let me add emphatically, if you want to manage them, never put on what is called "side." It is detestable under all circumstances, and would at once put a committee against you. If

you manage well, you will find that many a man whom you meet at first only as a client becomes your friend for life, and this management of clients is worth taking trouble over, if you consider that the one object of it is to enable you to do better work—to save your design from being cut down and spoilt, and so far promoting the practical advancement of architecture. For remember this—one good work does not remain alone, but leads others to do good work. It was said in this room, and it has been said elsewhere, that after all architects were the servants of the British public, and you will have to give them what they want. Well, I admit we are the servants of the British public, but we will best serve them by giving them what they ought to have and what is best for them. If men come and give you a commission to carry out fads and impracticable notions, or schemes which you know to be wrong, and which, if carried out, would be a disappointment to them and no credit to you, then the only true way to serve the British public is not to give them what they want, to oppose them, but to do something more: to show them where they are wrong, and even persuade them to do that which is right. This, in my opinion, is true service, and should be paid for double commission. I have known instances where it took almost as much of one's time to keep a client from going wrong as it took to do the drawings of what was carried out. I am not advising that you should take the high-handed course of opposing every suggestion that is given to you by your clients; on the contrary, I think the wise architect is not so conceited as to think no one has good ideas but himself; and he will take any suggestion, if there is any good in it, from whatever source it comes, and apply his skill to lick it into shape. We are not an artistic nation; the public are not hungering and thirsting after art in building; but they will thank you afterwards for giving it to them, even although they may oppose the doing of it. Let me give you a little illustration of this. I was once engaged on a large public building, and the work had so far advanced that we had to come to the staircase. It was a big one, and capable of being made a grand architectural feature. You will often find that your best opportunities for applying your art is in the interior of your building, and you will have to make the opportunities for yourself; they will seldom be offered to you. To carry out my idea I asked for some £15,000 or £20,000 to make it a marble staircase. This was staunchly opposed by some on the ground of cost. It is quite unnecessary, said they; a good, easy, stone stair, with a handsome cast-iron railing and plaster walls is all that is required, and will look very handsome and spacious. What do you want with marble steps and balustrade, and marble columns and walls and floor? It is extravagance and waste. Well, I got what I wanted, and in time the staircase was completed, and done in a way and at a cost far beyond anything the committee had ever seen or contemplated having. Soon after the work was completed I was present one evening at a reception, and met one of the leading opponents to the work, a staunch economist, on this very staircase. He came up to me with much friendly enthusiasm. "Mr. Young," he said, "this is grand. I had no idea you intended giving us anything like this, or I should not have opposed it for a moment. We are all proud of it; every ratepayer is proud of it, and not one penny of cost is grudged." In this instance people got what they wanted, not what they asked for, and I have no doubt that they would have been quite satisfied and found no fault with me if they had got instead the stone staircase with the cast-iron railing. Your first work you may regard as the foundation-stone of your future success. If it is well designed and well carried out—the one will be no use without the other—it will bring you another, and the next may bring you two, and so on. If your first work is not a success you will have missed one of your best opportunities. How are you to make it a success? First of all, let your design be thoroughly practical—we live in an age when the practical is put before everything, and is better understood and appreciated than the artistic. Notwithstanding this you should try and be something more than only practical. Try and infuse something of the spirit of art into your work. For there is no doubt that such work is appreciated by some people when it is done, and will tell in your favour. There is a kind of

erroneous notion abroad at present that if an architect is practical, he is not artistic; and that if he is artistic, he is not practical. Let your work show that you are both practical and artistic. A man may be thoroughly practical, and with all his efforts he may not be able to put any artistic feeling into his work. It is no fault of his. But if you have the gift of artistic conception, it is entirely your own fault if you are not practical, for practical knowledge may be acquired partly in the classroom, but more in the office and the workshop, and mostly on buildings in progress. It is this combination of the practical man and the artist that will make your work a success. Besides knowing everything about good and bad material, and good and bad workmanship, your client will expect you to know all about the proper cost of his work, and it is reasonable that he should do so. An architect should always know what his work should cost, and his estimate must be very loose indeed if he cannot find a first-class builder to do the work at his estimate. Sometimes even surveyors may go wrong, and it may be necessary for you to look after them. Some years ago I had a mausoleum to build. It was a small thing, a Greek cross on plan, with a dome, and all in stone. The estimate came in about £4,000, which was much more than it ought to be. I looked at the prices, they were not unreasonable. I, at last, got the total amount of stone in the estimate, which seemed enormous. The fault was here. So I sat down with the surveyor and went through every stone. I happened to be quite as well up in masonry as the surveyor, and the result of this was that the estimate was brought down to something like £3,000 without altering the design in any way, and the work was done. It is not interesting work, but your clients will, above all things, expect you to look after the cost of things, and advise if it is fair or not. You should have an eye to this in your education. I think myself that estimates and accounts are the *bête noir* of an architect's life. They hamper you with your designs when you are doing the work, and they come back to you when the work is done, and you want to forget all about it. But nevertheless, you will find it much to your advantage to be well up in the cost of things. "Keep within your estimates" was the advice given to me when I was commencing practice by an architect who was doing a large amount of work; "that," he said, "is the way I got on. I got a name for always keeping within my estimate, and clients came to me on that account." It was excellent advice, and I pass it on to you. Years afterwards, in conversation with one of the most eminent civil engineers of the day on this same subject, he said: "If we want an extra £100,000 for structural purposes we get it, for no company would take the risk of failure, after the request." That was also a useful hint, and I pass it on to you. On no account avoid asking for an extra, if it is necessary, for foundations or any structural purpose. But, apart from all this, there are times when an architect is building for the future as well as for the present, when cost must be a secondary consideration, when the first and only duty is to do the work thoroughly well. This occurs mostly in large public buildings, but also sometimes in large private buildings. Such opportunities are not to be missed or misused by questions of cost. You may save a few thousands, and spoil your work, and the generations who come after, and who have to pay their share of the cost, will blame you for not doing the best. Cost is only a question of a grumble of a day or a year—good work is appreciated for ever. As well as being a servant of the British public, a true architect is also a servant—he should be a disciple—of the great art of architecture, which is neither English nor French, neither German nor Greek. It belongs to all countries and to all ages. It is neither Classic, nor Gothic, nor good Queen Anne; but all of them, and much more. Its aim and mission is a large one. It is not to put up a beautiful building here and there, but to make every building beautiful, both without and within, and to make all the surroundings of life beautiful. Why should not every building in every street be beautiful, and the streets and the squares themselves made beautiful and pleasant places? It is not an impossible idea—it is not even an extravagant one—and in time I believe it will be done. It would do more to make people happy than an eight hours day, and it is quite as attainable. Apply your architectural educa-

tion to bring about this end, not only by putting up good buildings, but by your influence becoming in a way missionaries of your art, to teach people to love the beautiful, and create a demand for it. This is another way of serving the British public. In all your work take utility for your friend, and practical knowledge for your companion; but let the beautiful be your only love. With this triple association, your works will serve all the useful purposes for which they are intended, and they will possess all the elements of stability and endurance, and, being pervaded with the highest quality, the beautiful will appear in them everywhere. Take with you to light you in the way of practice, all the Seven Lamps of Architecture. Take the Lamp of Sacrifice, the Lamp of Truth, the Lamp of Power, the Lamp of Beauty, the Lamp of Life, the Lamp of Memory, and the Lamp of Obedience. But I am going, as a practical architect, to suggest to you a new lamp, which has served me, and will probably help you on your way—the Lamp of Enthusiasm. Older and perhaps wiser men will say,—No, no; don't recommend these young men enthusiasm, give them rather perseverance. Well, perseverance is a very good thing, and indispensable, but perseverance is cold and enthusiasm is greater, for it is perseverance with love added, and you will do no good work without love for your work. Perseverance may make a surveyor, but it takes enthusiasm to make an architect. Light up the Seven Lamps to guide you with your work, but illuminate your drawing-board and your mind with the light of Enthusiasm. It will help you over difficulties, and will sustain you in days of doubt and depression, which come to all men, and especially to men of artistic temperament. If I were asked to put in one sentence how best to apply your architectural education, I would say: Preserve your enthusiasm for your art. By this means you will best apply your architectural education. By this means you may advance the architecture of the day in which you live, and by this means you may be enabled to add your own contribution to the architectural monuments of the world.

Mr. E. W. MOUNTFORD proposed a vote of thanks to the lecturer, remarking that he had had some little experience with competitions, and thought that if a man went into them enthusiastically, and with some thought, he could not go far wrong. When a young man commenced practice he was not overburdened with commissions, and he did well in that case to try his hand at a competition or two; he was certain, if he put forth his best efforts, to gain experience in some one subject, and was the better prepared for paying work when it came, even if he never won a competition. In most competitions, however, there were a large proportion sent in that never had a chance of winning; he should say that 75 per cent. were so feeble that one wondered why they were sent in. Taking it all round, there was not much to complain of in competitions as now conducted with assessors, although a glaring case occurred in South Wales recently, where the author of the premiated design was superseded in the job by a local man, who offered to carry out the town hall for 4 per cent.

Mr. J. M. BRYDON seconded the vote of thanks, which was supported by Mr. SIDNEY VACHER and Mr. E. S. GALE, and carried by acclamation.

Mr. YOUNG, in acknowledging it, said that perhaps he might some day give a lecture, as had been suggested, on "How to get Clients"; but he should be compelled to charge a guinea a-head to those who heard it.

HEREFORDSHIRE NOOKS AND CORNERS.

MR. H. THORNHILL TIMMINS has issued a well illustrated and popular handbook of Herefordshire, and Mr. Elliot Stock has published the work,* with a terse introduction by Canon Phillott, who, naturally enough, rejoices in the quiet of his little-travelled county, possessing no manufactures and not many commercial attractions, lying as it does out of the way of the ordinary traveller. The nooks of scenery, wood and water; nooks in architecture, domestic and ecclesiastical; and nooks peculiar to the unsophisticated rural life of the Herefordshire native, have all charms of their own, dear

to the artistic mind, and Mr. Timmins has given us a reliable guide which may well serve as an inducement to those who know the county only slightly to increase an acquaintance with it in the pursuit of the noble, lovely, and picturesque. Herefordshire, stretching from the shelter of the Malvern Hills to the Black Mountains of Wales, is watered through the Forest of Dean by the Wye, which breaks its way to the sea by the rugged gorge of Symond's Yat. To the north the river Teme tumbles along amidst picturesque scenery, and soon to Ludford, Ludlow, and Shropshire. The broken and hilly character of the fertile lands of the county of Hereford presents an almost endless variety midst every change of prospect over the water-meadows, orchards, hop-gardens, corn-fields, and clumps of forest trees in the richly-wooded landscape, where

"No spring nor summer beauty hath such grace
As I have seen in one autumnal face."

The city of Hereford is situated almost in the centre of the county, and thus forms an admirable starting-point for exploring the district in any and every direction. Mr. Timmins gives us several views, descriptive and pictorial, of the city and its cathedral; but one special value of his book consists in his taking the reader to outlying and comparatively unknown spots, instead of packing his pages with materials most ready to hand, such as those concerning Hereford itself and other of the more familiar spots. His drawings are fairly well represented by the selection which we print to-day from the original blocks. These, by way of being the more interesting to our readers, are exclusively of old buildings; but in the volume itself will be found some sketches of a more pictorial character, representing the scenery and other local details, and facing the title-page a capital map is provided, showing the county at a glance. We have devoted so much of our limited space to illustrations from Mr. Timmins's book that we are prevented from following him through his descriptions generally so closely as we should otherwise wish to do, and, therefore, must confine our remarks more particularly to the subjects represented in his accompanying sketches. The Grange House at Leominster, hard by the recreation grounds, is now a private dwelling, and is a reconstruction of the old market house or "Butter Crosse," which was thus rescued from destruction by Mr. J. H. Arkwright, of Hampton Court, which lies a few miles nearer Hereford. It is one of the best specimens of the handiwork of that famous 17th-century builder, John Abell, whose other houses of a similar kind at Hereford, Weobley, Kington, and Brecon have unfortunately been razed to the ground. The building is carried upon twelve stout oak posts, treated as columns, with Ionic caps, with brackets and arched timbers. Along the head pieces an inscription is carved, written partly in English and partly in Latin, with the date 1633.

Prior's Moor lies out of Hereford over the hills past the White Cross, which is a memorial of the time when the plague visited Hereford, the town's market being held here then instead of in the stricken city. The pink-washed walls of the old farm house and pigeon-cote make a brilliant contrast with the blue sky beyond, and harmonise well with the timber framings and the brickwork.

On the high road between Kington and Presteign, just within the county border, stands Rodd manor-house, with its wide mullioned windows and doorway set deeply within a massive arch. It is a pleasing example of brick and stone building, picturesquely covered with creepers and ivy mantlings. Inside "The Rodd" is very little altered. The rooms are panelled with oak, and have oaken floors and big, low-proportioned doors, furnished with the original hinges and latches in solid frames. The principal apartments are wainscotted from floor to ceiling, and contain two handsome chimneypieces, the lower one bearing the arms of Rodd and Price. We illustrate one of these fireplaces. Adam and Eve, accompanied by the serpent, which enriches the central pillar, form the subject of the "Temptation." The jambs are composed of two Jacobean-dressed men, both bearing the left arm in a sling, while the pointed beard of each is grasped by the other hand, suggesting the conjecture that thereby "hangs a tale." The Rodds (Rodes or Royds) are an ancient family, and this old manor is their historic home. Sir Hugh de Rodd distinguished himself at the battle of Ascalon, in Palestine, in

* "Nooks and Corners of Herefordshire." By H. THORNHILL TIMMINS. London: Elliot Stock, Paternoster-row.



THE RODD.



WEOBLEY.

the days of Richard I.'s crusade against the Saladin.

Weobley is a village of the veritable "Sleepy Hollow" character, but its handsome church

and charming old houses bear witness to its more prosperous bygone times when it returned two burgesses to Parliament. In Leland's days it was a market town, and had, he says, a goodly

castle, belonging to "My Lord Ferrers." The market house, erected by John Abell, has been destroyed, like the castle. In the main street are several old timber houses, and one formerly the

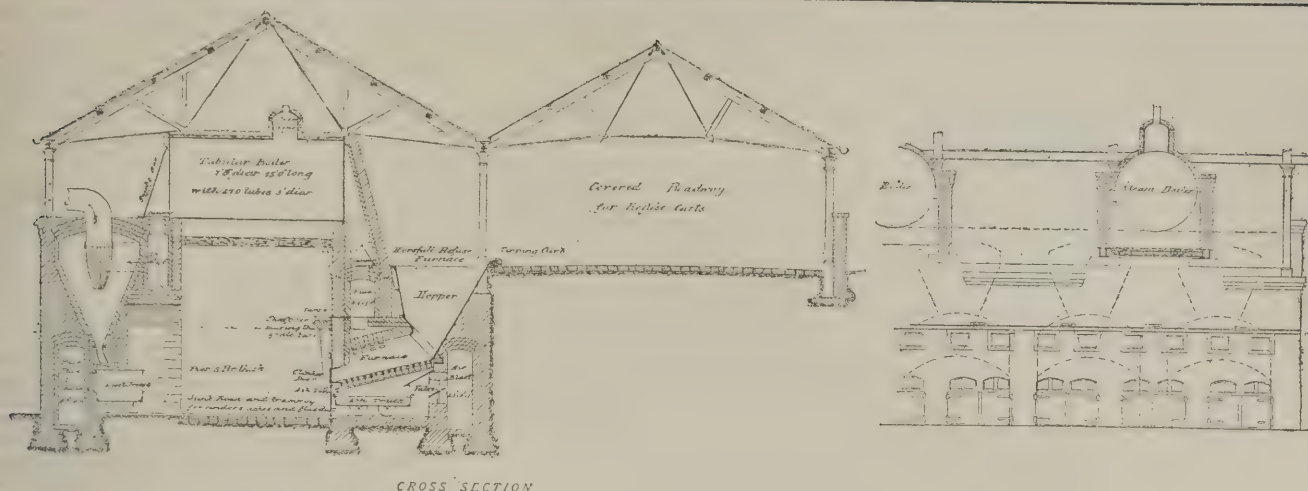
abode of one Tomkins, whose exploits are recorded in a sonnet written to his honour, for "he was the father of thirty-two children, born in one chamber at Weobley." We illustrated the old schoolhouse porch in the *BUILDING NEWS* for August 28, 1891, and herewith we print a view of one of the streets, with the church spire over the trees in the distance. Mr. Timmins gives several capital sketches of the place. The pigeon-house at Buttas belonged to the farm property erected near Wormsley, the site of an Augustinian priory, and was built by George and Elizabeth Kauer in 1632, and was locally known as "The Falconry." This quaint little building is the handsomest of its kind in Herefordshire, and is richly decorated with running foliage. It stands in an out-of-the-way place upon an eminence, by the side of the farmhouse, overlooking a fine landscape bounded by the Malvern Hills, which can be seen on a clear day. Among the other subjects illustrated in the book before us are Abbey Dore Church, Kilpeck Church, Treago House, Fawley Court (near Ross), Cradoc House, Sellack Church, Ross Market, Rudhall Manor, Goodrich Castle, Wythall Farm, and Croft Castle. The volume is nicely got up, and, besides being a capital drawing-room book, will make a useful addition to the architect's collection of topographical handbooks of a reliable architectural character. No better evidence of this need be wished than the illustrations given by us with this notice to-day.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE inaugural meeting of the present session of the Institute was held on Monday evening, when there was a large attendance of members and their friends, including several ladies. The chair was occupied by the President, Mr. J. MacVicar Anderson, who delivered his opening address. He remarked that we lived in an age of progress, and that this element was the characteristic of a living age. Not all the changes and reforms of modern times had advanced civilisation, and he was assured that some at least of the changes with which society was now threatened would fail in attaining the results professedly desired by their advocates, and would end in disappointment, if not disaster. In a review of some aspects of the profession, he was struck with a remarkable development of recent years—the perfection which architectural draughtsmanship had attained. It was not possible to regard the drawings submitted yearly for the prizes offered by the Institute and the Royal Academy, or prepared in profusion for competitions, with anything short of admiration, combining as they did technical accuracy with artistic feeling—the essential characteristics of good draughtsmanship. To set side by side the drawings of some generations since and those of to-day, was to exhibit not so much comparison as contrast; for in many drawings of old masters in architecture knowledge of perspective and firmness of touch were alike conspicuous by their absence. The perfection of modern draughtsmanship was, no doubt, to be traced to some extent to the spirit of emulation inspired by competitions for students' prizes, and to the prevailing practice of inviting competitive designs for public buildings, both of which enlisted all the resources of the draughtsman's skill. That this advance in architectural draughtsmanship constituted, so far as it went, real progress might be conceded; indeed, the younger members of the profession might be honestly congratulated on the artistic beauty and perfection of their handiwork. If, therefore, he pointed out a temptation to which their skill exposed them, he did not desire to detract from the legitimate merit of their work. No one could doubt the importance of good draughtsmanship to an architect, for it enabled him to express readily and freely the ideas which were to constitute his design. The pencil was to the architect what the pen was to the author—the mode of expressing his ideas; no more. Essential as this was, obviously the mode of representation was of less consequence than the thing represented, and it was because he had observed a tendency to drown architecture in mere draughtsmanship that he reminded his hearers that, although every architect ought to draw, and draw with facility, it was yet possible to be a good architect without being a brilliant draughtsman; and, conversely, that it was possible to be an expert draughtsman,

and yet not to have any claim to be an architect. Architecture was the material embodiment of conceptions of the mind: drawing was the medium by which these could be, at the best, but inadequately expressed. It might be excusable to smile at the draughtsmanship of old masters whose names lived in history as great architects; but it might not be amiss for the brilliant draughtsmen of to-day, while justly proud of their attainments, to ponder on their prospects of acquiring equal fame; for while it was good to know how to draw with artistic excellence, it was better to know how to design with purity and truth. In architectural competitions the importance of appointing professional assessors was often enforced on the ground that it was impossible for promoters to arrive at a just decision without the assistance of an expert. This was true; but there was another side to this question—viz., that not the least responsible part of an assessor's task was to protect promoters from being imposed on by the tricks of draughtsmen whose ability was more apparent than their morality. Such trickery might mislead the uninitiated; it was transparent to the expert, and at the hands of a just assessor it would not fail to meet with a just reward. Touching next upon architects' education, the President raised a laugh and cheer by remarking that Modern Progressivism had not reached the stage of proposing that free education should be extended to students in architecture; and the risk of over-education, therefore, was one to which they were not as yet exposed; but, apart from such a Utopian prospect, which might be in store for their posterity, the educational facilities which students now enjoyed were remarkable when compared with those of a generation or two since, and especially so the latest developments exhibited in the remarkable curriculum of University College, King's College, and the Architectural Association. The new departure of the latter body was regarded by not a few with some amount of apprehension; but the progress attained during the first year—necessarily the most trying and critical—had been real, and such as to encourage the promoters in the continued and energetic prosecution of the scheme. The scheme now under consideration of creating architectural provinces, each with its own centre, and embracing an area with defined boundaries, would certainly tend, by stimulating local organisations, to facilitate the attainment of systematic educational organisations throughout the country. To what extent architectural education was likely to be affected by the proposed establishment of a Gresham or Teaching University for London could not be predicated. That such a university must embrace art, as well as science and literature, might be taken for granted, and it would seem reasonable that a definite place should be claimed for architecture. Teaching naturally suggested examination, and as to this he would remark that no advocate of examination ever thought or expected that it would or could create a great architect. It was not fair criticism to condemn an educational test because it did not effect a result which was never intended, and which was impossible. As consistently might University tests be objected to because they did not in all cases produce great divines. No one disputed the point that they acted as stimulants to the acquirement of knowledge upon which success in life so largely depended. The Associates' examination had hitherto successfully withstood the somewhat fierce—and not always just or fair—criticism to which it had been exposed, for as a practical issue, the rising generation of architectural students had come forward in increasing numbers, and the cry was, "Still they come!" Did not that imply that they appreciated the active labours of the Institute in endeavouring to raise the standard of knowledge and promote the efficiency of architects, rather than mere academical and inoperative disquisitions? The examination might, perhaps, exhibit defects of organisation, or might be capable of improvement in certain particulars, but that, after all, was no more than might naturally be looked for in a comparatively new institution. The examination continued to prove an encouragement to study and a stimulus to the increase of knowledge, and thus had been a step in the direction of real progress. He would remind architects that the examination would be conducted in its present form until the end of 1893 only, and that thereafter the progressive examinations would be in full operation. As to the proposed examination or qualification for Fellows, he thought that

all were now convinced, whatever might be their individual opinions as to how the change should be effected, that some change should be made in the qualification for Fellows. It would be inconsistent and intolerable were the present position to continue, for it meant that up to thirty years of age men could only be admitted to membership by passing an examination, and that after reaching that age they could be elected Fellows without any such test. This was never intended to be a permanent arrangement, and had only to be stated to secure condemnation. Mr. Charles Barry's proposal, now under consideration by the Council, that candidates for fellowship should, with certain exceptions, only be elected from the class of Associates, would practically be equivalent to applying the same test to the primary and secondary classes of members, and did not seem to the President sufficiently to meet the case. Then, again, others considered that the qualification for Fellowship should be a separate examination on a higher grade than that for the Associateship. To that the reasonable objection might, he thought, be raised that men would thus be called on to undergo an exhaustive and trying ordeal at a time when they were likely to be engrossed with practice, and would not, therefore, have leisure to prepare for it. Personally, he thought that the further test or qualification for Fellowship should be, in addition to what now existed, an examination of the actual work of the candidate. He would say, let an Associate be tested as a student; let a Fellow be tested as an architect. To carry this out, it would only be necessary to enact that on and after a date to be specified, every person desiring to be admitted a Fellow should, in addition to the present qualification, be required to have passed the Associates' examination, and to undergo the further test of submitting to the Council evidence of his executed works, always providing for special or exceptional cases by the dispensing power which the Charter conferred on the Council. What better or more fitting test could there be? for by his works the architect was known and judged by the public. It might be objected that this would be subjecting an architect to examination on what, after all, was a mere matter of taste. He thought not. Architecture was much more than a matter of taste, and if this test were applied, it would be a test of architecture. The Council of the Institute was composed of individuals each one of whom had his own idiosyncrasies and preferences, and his own conception of what constituted good architecture; but the collective body would ever be the representative, not of a school or a party, but of the profession of architecture, and he could conceive of no adjudicatory court likely to prove so fair and so competent. He hoped that the Council might see their way to present a unanimous recommendation on this subject, and that after full discussion the Institute might also arrive at a unanimous decision as to the best solution of the problem. The President, having referred in terms of regret to the resignation by Mr. Aston Webb of the office of honorary secretary, which he had held for more than three years, expressed his pleasure that Mr. William Emerson had consented to serve if elected, and as his was the only name submitted he would be proposed for election at the business meeting to be held a fortnight hence. The great question of Capital and Labour, the President continued, is one which we architects cannot disregard. Capital and Labour are alike essentials to the execution of our designs; without them we could produce pictorial representations, but not buildings. Labour may be congratulated on the manifest desire now exhibited by society to accord to it fair, and even liberal, remuneration. That this may to some extent be attributed to the stand which workmen have by combination and organisation made in defence of their interests, may be fairly conceded. To combination for such legitimate objects no reasonable person can, or does, object; but when trade organisations are used for the purpose of imposing arbitrary restrictions on labour, of depriving the workman of his right as a free citizen to work how and as he pleases; or of arbitrarily reducing the hours of work without a corresponding diminution of wages, such as may be dictated by the law of supply and demand, then it seems to me that the real friend of the working man is not his leader who preaches such pernicious doctrines, opposed alike to political economy and common sense, but rather he who bravely warns him of blind leaders of the blind.



CROSS SECTION

who, be their motive what it may, are luring him to inevitable and certain disaster. When last year I was—as your representative—invited to settle by arbitration the differences that then existed between the master builders and the carpenters of London, I did not hesitate, when making the award, to record my conviction that the result of such action had been to inflict permanent injury on workmen by driving their trade into foreign channels, from which it was not likely to return. That this has occurred there is abundant evidence to show. Having referred to the projected new thoroughfare from Holborn to the Strand, and criticised the direction of the thoroughfare at its southern extremity, the President continued: In their report, the committee of the London County Council state that the plan which they recommend would enable “the Council to control the architectural elevation of the new street.” Should this mean that the control is to be real—and not visionary as in the case of Northumberland-avenue—and that it is to be exercised by persons competent to deal with the subject, we may regard the proposal with satisfaction; for, under such conditions, architects need not dread irksome interference with their designs, but those who claim to be so without justification would be properly subjected to control from which the public could not fail to derive benefit. It is to be hoped that architects who may be consulted may be inspired by no lesser motive than the endeavour to educate public taste by adorning a public thoroughfare. Our teaching is not that of a book or a parchment, which may be read or cast aside, nor that of a picture, which may be studied or disregarded at pleasure, but it is engraven in a material form which must be seen and read of all men whether they will or not. Would that architects who undertake to design buildings for important sites and leading thoroughfares always realised that they incur responsibility, not to their clients only, but to the public also. Speaking generally, for there are exceptions here as elsewhere, who will say that the structures in Shaftesbury-avenue adorn it, or create emotions in a cultured mind other than those of irritation and disgust? Buildings they are certainly—architecture they are certainly are not. Take another illustration. Who can imagine that the authors of the edifices which have recently been erected on that magnificent thoroughfare the Thames Embankment between Waterloo and Charing Cross Bridges, or at Albert Gate, realised this responsibility? We hear much said, and we see much written, of the necessity of educating public taste. But, while this is too true; while splendid opportunities are absolutely sacrificed which might have been and ought to have been mediums for elevating and refining public taste; yet when I recall the depressing dreariness of an age of stucco and monotony now happily a thing of the past; when I behold the advent of an age distinguished by the use of genuine materials; when I appreciate the artistic spirit which unquestionably breathes in much of our domestic work; and when I recognise the undoubted desire of all—whatever their shibboleth—to promote the knowledge of our art, whether by study, practice, examination, or æstheticism, I gladly record my conviction that the architecture of to-day—although falling far short of what we long to see, although exhibiting

an exaggerated enthusiasm for the element of quaint picturesqueness which I hope at no distant date to see leavened by the spirit of classic purity and simplicity—is yet not altogether unworthy of the enlightenment of these latter days, nor altogether out of harmony with this age of progress.

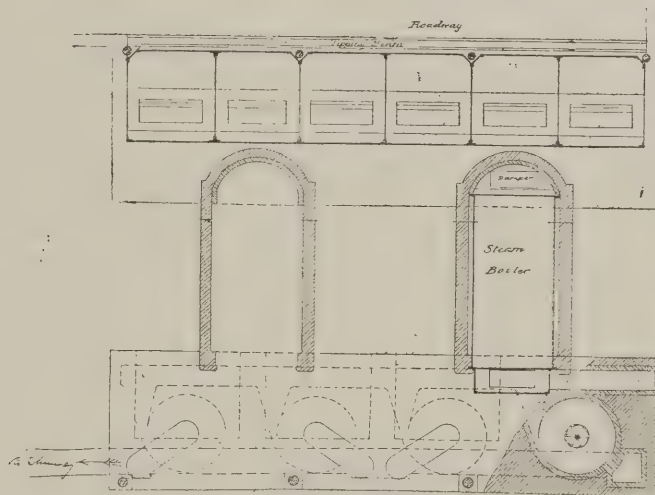
A vote of thanks was accorded the President by acclamation on the motion of Mr. Eustace J. A. Balfour, seconded by Mr. Paul Waterhouse, and supported by Mr. H. Hardwicke Langston.

REFUSE DISPOSAL.

NEXT after the removal of sewage from our towns comes that of getting rid of refuse, and few large towns are now without some practical means of dealing with a problem of

report, “is the use of the most modern and improved type of refuse destructors, together with sludge presses for reducing the semi-liquid sewage into dry, pressed cakes, which are just as combustible as ordinary ashpit refuse. With this fuel, supplemented by a moderate quantity of domestic refuse, these destructors will evolve a heat capable of raising enough steam in an ordinary boiler to supply a considerable engine power.”

Objection is taken to the old-fashioned destructors in Salford and Broughton, on account of the heavy, moist fumes they throw out. The new scheme is illustrated in the report by drawings of the destructor furnaces, boilers, and dust-catching appliances, which we herewith reproduce. Referring first to the sludge-pressing process, the report enters into a detail of the cost of buildings, sludge-pipes, and presses,



PLAN

increasing difficulty. A new scheme having several novel features is now under the consideration of the River Conservancy Committee of the County Borough of Salford, introduced by its engineer, Mr. Joseph Corbett, and will probably be soon in operation. We have no confidence in the general applicability of one scheme: circumstances and conditions entirely alter cases. On the observance of this principle, the borough engineer of Salford has based his plans for the disposal of the sewage sludge and domestic refuse of that important borough. In reporting on the sewage sludge disposal and sewer ventilation, Mr. Corbett has taken into consideration the various concomitant interests, and has been enabled to suggest a combined scheme for the carrying out of several processes that must tend to an improved sanitary condition of the borough. We refer to the surveyor's report on the means of disposing of the sludge at the Salford sewage works, the means of disposing of domestic refuse and ventilating the main sewers, and of supplying steam to the sewage pumping engines. The “main base of my first scheme,” says the

steam-engines for treating 240 tons of wet sludge per day, the capital outlay being put at £5,500, or a total annual cost, including repairs, of £2,279, equal to 2s. 1d. per ton of sludge cake. The output from this process is estimated at about 48 tons per day of pressed sludge cake. The dealing with the refuse comes next. The illustrations we give will explain to our practical readers the nature of the destructor furnace proposed by Mr. Corbett. The Horsfall patent refuse furnace or destructor has been adopted. It economises labour, effects a more perfect combustion of the refuse, less consequent nuisance from effluvia, and principally gives a higher temperature in the furnace for raising steam. As will be noticed in the section, the steam boilers are worked by the heat from the flues, so that no heat is lost after doing its work in the furnace, the heat being greatly intensified by the means adopted in the construction of the fire-bars and the flues, and also by the powerful air-blast introduced through the channel shown at the side of the furnace. The apparatus may be explained thus: On looking

at the section, it will be seen that a capacious hopper, square in plan, is provided at the side of a covered roadway, through which refuse carts will be taken. There will be six of these hoppers in a row (see plan). The refuse will be tipped from the carts into the hopper, and slide into the furnaces, which have removable firebars actuated by a cam shaft at the output end. By this movement the refuse will be gradually advanced through the furnace, the movement of the firebars increasing in the hottest part so as to prevent any massing of clinkers or ashes. At the upper part of the furnace-arch it will be seen that apertures occur for the flame near the output end. Below the furnace is the ashpit, closed by doors, through which on an ash-truck the ashes can be removed into the centre tramway. The air blast is into the closed ashpit, the effect of which will be to increase the draught through the fire and produce a high temperature. The cost of the six Horsfall destructors, with blowers, &c., will be about £1,700, and the annual expense about £480. Above the sunk road tramway are two tubular boilers, 15ft. long and 7ft. diameter, each having 270 tubes of 3in. diameter. These are shown also in the longitudinal section. The boilers are to be worked at 65lb. pressure, and will save the coal now consumed for the old substituted boilers. It appears that about 30H.P. of steam can be produced from each furnace, which will consume about six tons of refuse per day. The power required for the air blast and for moving the fire bars will be about 2H.P. per cell, leaving 28H.P. per cell available, or for the six cells 168H.P. The report states that this power will be quite sufficient for the working of the sewage pumping-engines and also the sludge presses, and that the sludge from the sewage will suffice to provide all the fuel required.

On the other side of the cross section of apparatus is the dust-catching appliances. The old flue-chambers of destructors provided to catch the furnace dust carried by the draught of the chimney, have been found of little use, much of the flue dust being carried up the chimney and scattered over the neighbourhood. To avoid this nuisance the "Cyclone" patent dust collector has been applied. It is simply a conical-shaped vessel, with the apex downwards, into which the dust is carried by a blast of air. There is a tangential opening on one side near the upper part of cone, through which the dusty air enters, causing a whirling rotary movement, by which action the particles of dust are thrown against the sides of cyclone, and descend to a small outlet at the bottom, where they are received in a dust truck. The dust-freed air ascends through the vertical tube shown in the upper part of cone, and is led to the main chimney. By these cyclone dust catchers, of which four are shown in plan, the labour of flue cleaning is avoided, and the dust can be removed as shown. The cost of the four cyclones is put at £1,100.

Alluding to the means for ventilating the sewers, the engineer proposes that the two "Sturtevant" blowers required for the furnaces be arranged to draw air from the intercepting sewers, causing a strong current through them, and consuming any injurious germs or gases. The present openings at the sewer outfalls and those in manhole covers would be closed, so that all small vents would become inlets for fresh air.

The harmless hard burnt refuse produced from the furnaces it is proposed to tip on low ground, and as there is now nearly 30,000 tons annually to dispose of, the alternative plan is put forward of using the destructors for domestic refuse only, and of disposing of the sewage sludge by steamers to sea. The author suggests that, as the quantity of domestic refuse is continually increasing, a certain proportion (48 tons per day) of the refuse should be burnt in the destructors and the sewage sludge conveyed to sea on sludge steamers. The statement of cost of both schemes is important, though we cannot quote the figures here in detail. It is enough to state that the total value and estimate of first cost for pressing and burning sewage sludge is £9,350, and an annual expense of £3,558, showing a net annual saving of £172, or that 87,600 tons of sludge can be disposed of and steam supplied annually for 9½d. per ton; while the alternative scheme last mentioned gives a total first cost of £14,350, and a net annual saving of £2,610; or that 128,120 tons of sludge, domestic and trade refuse, can be annually disposed of, and steam supplied, for £1,159 a year, or at the rate of 7½d. per ton. The above scheme meets the diffi-

culty of refuse-disposal in a thorough and efficient manner, and at a cost that compares favourably with that expended in other towns.

THE ELECTRIC LIGHTING OF SMITHFIELD MARKETS.

A VERY important electric installation has been made by the Corporation of the City of London in connection with the lighting of the Central Markets, Smithfield. The contract has been taken by the well-known firm of electricians, Messrs. Julius Sax and Co., who have arranged an installation which promises to be a model of its kind in the City. The whole area of the markets to be lighted is seven and a half acres, at a cost of about £30,000, though only the poultry and provision sections are at present completed. The vast area of buildings and avenues, which were lighted for the first time on Friday evening by the Lady Mayoress, will form a brilliant centre of illumination in this not very well-lighted neighbourhood. The whole installation, when completed, will certainly be one of the largest in the country of a private character. A few figures will convey an idea of the extent of the work accomplished by Messrs. Sax and Co. The wiring is said to extend 40 miles in length, the number of lamps now lighted are, we believe, about 8,500, though the total number will be 12,000, and these are from 15 to 50 candle-power each. The arcades are lighted by incandescent lamps. Six dynamos with an output of 200 units each are required, worked by four engines of 200H.P. The tenants will be supplied, it is stated, at the same price as they pay for gas, the cost of the plant and fittings being defrayed by the Corporation. The switching on of the light by the Lady Mayoress, in the presence of a large number of civic functionaries and friends was unique in its way, and was performed by the opening of a leather case and the withdrawing of a gold paper-knife in the form of a dagger, which completed the circuit. This was presented to Lady Evans by Mrs. Sax, and the firm of Messrs. Sax and Co. afterwards entertained at the Dr. Butler's Head, Basinghall-street, a large number of Common Councillors, scientific gentlemen, and representatives of the Press to a dinner.

OBITUARY.

MR. JAMES WILLIAM WILD, for the past fourteen years the Curator of the Soane Museum, died, on Monday last, at the Museum residence, 13, Lincoln's Inn-fields, at the advanced age of 78 years. Mr. Wild was trained as an architect, and was the brother-in-law of the late Owen Jones. Many of his earlier works of half a century since excited considerable interest at the time, as they were clever adaptations of the Byzantine style, then little known to English architects. He was also well versed in Arabic art. Among his buildings were the church on Blackheath-hill, erected about 1838; that of St. Lawrence, Southampton (Early English, in white brick, with groined vestibule under the tower, to which a spire has since been added by Mr. A. Bedborough); Christ Church, Streatham-hill, built in 1841 (a white brick basilica, Lombardic-Byzantine in style); and St. Martin's parochial schools (since altered into a school of art) in Castle-street, Long Acre, built about 1850. Mr. Wild also carried out the British Embassy at Teheran, and St. Mark's Church, Alexandria; he recently designed and superintended additions and alterations to the Soane Museum. He was for many years one of the staff in the architectural department of South Kensington Museum; and in April, 1878, on the death of Mr. Joseph Bonomi, the Egyptologist, was elected to the post he held till his death. The appointment of the curator is vested in the president, council, and trustees of the Royal Academy.

Mr. Edward Graves, Engineer-in-Chief to the General Post Office, died on Wednesday, at his residence, Earl's Court. He had completed 40 years of telegraphic service, having commenced with the Electric Telegraph Company at York. After the transfer of the telegraph to the Government he acted for some years as divisional engineer, with headquarters at Birmingham; and on the retirement of the late Mr. Culley he was appointed to the office of Engineer-in-Chief. He was engaged at the General Post Office up till a few days ago.

The death of Mr. Henry J. Marten, M.Inst.C.E., took place at his residence, The Birches, Codsall, on Wednesday week, from an apoplectic seizure. The deceased had long been associated with many of the engineering and sanitary societies throughout the country, and he had been identified with a number of important engineering schemes. The Waterworks at Wolverhampton were constructed under his supervision forty years ago, and since then he had devoted much time to water supply and allied subjects. He was consulted respecting the promotion of numerous waterworks undertakings throughout the kingdom, and frequently gave evidence before Parliamentary committees on these matters. He was associated with the schemes brought forward from time to time to improve the navigation of the river Severn, and prepared a plan for improving the canal navigation between South Staffordshire and that river. The deceased had been for twelve years one of the arbitrators under the South Staffordshire Mines Drainage Acts. He joined the Institution of Civil Engineers more than forty years ago. Mr. Marten, who leaves a widow, son, and two daughters, was twice married, his first wife being a daughter of the late Mr. E. B. Dimmock, with whom he entered into partnership, and managed for some years the Parkfield Ironworks at the Rough Hills, Wolverhampton. On the dissolution of the partnership, however, Mr. Marten resumed his professional career as a civil engineer. The deceased was 65 years of age. He has two brothers—Mr. E. Bindon Marten, M.Inst.C.E., of Stourbridge, who is one of the engineers to the South Staffordshire Mines Drainage Commissioners, and Mr. A. G. Marten, Q.C.

BOOKS RECEIVED.

Fifty Years of the Water Cure, by JOSEPH CONSTANTINE (Manchester: John Heywood), is a record of the experiences of one who has been an indefatigable worker, an advocate of hydropathy, and the author of several works on the water cure. We have no space here to give the gist of Mr. Constantine's genially written book. In this work he mentions many interesting incidents in his early life: his connection with bathers and hydropathic treatment, his opening of baths at Manchester, the introduction of the Turkish bath; diet, exercise, and a variety of cases of successful cures in erysipelas, scarlet fever, rheumatic fever, gout and rheumatism, &c. Many of these are wonderful instances of the value of the curative power of hydropathy when thoroughly carried out, and the experiences and suggestions of the author are instructive. Portraits of the author and of Drs. Wilson, Gully, and Edward Johnson illustrate the text. The author's work on ventilation and warming by the convoluted stove may be remembered by many of our readers.—*The Practical Polish and Varnish Maker*, by H. C. STANDAGE, Practical Chemist, &c. (London: E. and F. N. Spon), is a treatise or compilation containing some 750 recipes and formula of a practical character, and intended for the manufacture of polishes, varnishes, lacquers, &c., for workers in wood and metal. We have seen some of the recipes before, and we find instances where the compiler has duplicated the same recipe, or has allowed more than one version of a recipe to appear. Notwithstanding these inadvertencies, almost inseparable from works containing so many hundreds of references, the book will be found of value to all wood and metal working industries, manufacturers, and to the public generally.

At a meeting of the Lancashire County Council on Friday the vice-chairman presented to the Right Hon. J. T. Hibbert, M.P., first chairman of the council, on behalf of his colleagues, a life-size portrait of himself, in recognition of his services to the county. The portrait, which has been painted by Mr. Sydney Hodges, R.A., will be hung in the county hall at Preston.

A parish-room at Ashford, East Kent, erected near the college and church, from designs by Mr. R. P. Day, diocesan architect, was formally opened and dedicated by the Bishop of Dover on the 31st ult.

The popular lectures at Firth College, Sheffield, were opened on Saturday evening by an illustrated lecture on "Architecture in Norman Times: a Story of Natural Progress," delivered by Dr. H. C. Sorby, F.R.S., F.S.A.

CONTENTS.

Architectural "Survivals"	657
Full or Short Specifications	657
Architectural Association	658
Herefordshire Nooks and Corners	660
Royal Institute of British Architects	662
Refuse Disposal	663
The Electric Lighting of Smithfield Markets	664
Obituary	664
Books Received	664
The Building News Directory	XIII.
Our Illustrations	665
Competitions	665
Wayside Notes	684
Engineering Notes	684
Building Intelligence	685
Architectural and Archaeological Societies	685
Correspondence	685
Intercommunication	686
Legal	687
Legal Intelligence	687
Water Supply and Sanitary Matters	688
Our Office Table	688
Meetings for the Ensuing Week	689
Trade News	689
Tenders	689

ILLUSTRATIONS.

QUEEN MARY'S SUNDIAL, HOLYROOD PALACE.—BANK AT EASTBOURNE.—THE POWDER TOWER, PRAGUE.—ST. BARNABAS' PARISH CHURCH, DULWICH.—PUERTA DEL SOL, TOLEDO.—HOUSE AT NORTHWOOD.—HEREFORDSHIRE NOOKS AND CORNERS.

Our Illustrations.

QUEEN MARY'S SUNDIAL, HOLYROOD PALACE.

The ancient sundials of Scotland are justly celebrated for their variety and picturesqueness. Few, however, can compare with that which we fully illustrate to-day by Mr. R. W. C. Dick's measured drawing. In consequence of the top having been displaced some years ago, the panels were much damaged. The dial casts the time about a quarter of an hour slow by Edinburgh, but this defect no doubt is due to an error in the re-setting it in position. The curious devices on the panels are indicated by the detailed parts above the general drawings.

NEW PREMISES FOR THE LONDON AND COUNTY BANKING COMPANY, LIMITED, EASTBOURNE.

The building stands on a corner site opposite the railway station. The fronts are in red Mansfield stone and red brickwork. The work, including the bank fittings, has been carried out by Messrs. Parsons and Son, contractors, 118, Church-road, Hove, Brighton. Mr. E. Houghton was the clerk of works. The mosaic flooring was laid by Messrs. Mainzer and Kempthorne, of Berners-street, London. The wrought iron gates and railings were supplied by Messrs. Stodge and Co., Osnaburgh-street, London. The steel girders and joists were supplied by Messrs. Measures Bros. and Co., of Southwark-street, London. The architect is Mr. Fred. G. Cooke, of Eastbourne.

THE POWDER TOWER, PRAGUE.

The elevations and plan of this tower appeared in our issue for Oct. 28. To-day we give the sections which need no further description than that given with our previous illustrations, which, like these, were taken from the officially published monograph issued by the Mayor and Council of Prague as a memorial of the restoration of the tower, carried out at the cost of the Municipality by Mr. Joseph Mocker, architect.

ST. BARNABAS' PARISH CHURCH, DULWICH.

This church, now in course of erection, will comprise a chancel, having a morning chapel on the south side, and priests' and choir vestry on the north, the organ being placed in a loft over the choir vestry. The high altar is elevated by nine steps. The body of the church consists of nave and aisles with north and south porches, the latter having a muniment room over, access being obtained from the winding stair of the large tower which terminates the nave and forms a baptistery, the large west doorway of which will form an emergency exit. The heating will be by hot water, a boiler-house being provided under the priests' vestry. The materials are red brick and terracotta, with red stone for columns, window tracery, and internal dressings. The

roof will be covered with green slates. There will eventually be accommodation for 789 persons, but at present only the eastern half is being built, and the oak screen work to chancel, &c., is to be omitted. Messrs. Oliver and Leeson, of Newcastle-on-Tyne, are the architects.

HOUSE AT NORTHWOOD.

This house has lately been built at Northwood, near Pinner. The walls are faced with red bricks, and the roofs are tiled. The turret is rough-cast. The woodwork is painted white throughout, except the doors and shutters, which are bright green. The drawing from which this illustration is taken was hung in the last Royal Academy Exhibition. The work was carried out by Messrs. Chas. Brown and Sons, of Harefield, from the designs and under the superintendence of the architect, Mr. R. A. Briggs, F.R.I.B.A., of 2, Devonshire-square, E.C.

PUERTA DEL SOL, TOLEDO.

This illustration, from a water-colour drawing by Mr. A. Wallace Rimington, of Kensington, shows "the Gate of the Sun," the most famous of the projecting towers in the city walls of Toledo. Its age is not known, but presumably it dates from the early days of the 13th century. The finest gateway in the outer wall, Puerta de Visagra, was built *circa* 1108-26, and by examination the Puerta del Sol may be attributed to the above period. It is built of wrought and rough stone walling and brick combined in that mixed style peculiar to the Moorish type, as developed in Spanish national buildings. Over the entrance are the arms of the cathedral, with the B.V. Mary appearing to San Ildefonso. From the gateway a fine view is obtained over the Vega, and Mr. Rimington's charming study does his subject justice.

HEREFORD NOOKS AND CORNERS.

(See notice and sketches on pages 660-661.)

CHIPS.

Extensive structural alterations are to be made to the Old Kennel Church, Edinburgh, N.B. The work has been placed in the hands of Mr. J. Williams Dunford, M.S.A., architect, of 100c, Queen Victoria-street, London, E.C.

Some time since the bells of Pickwell Church, near Oldhills, were restored, and now a new clock has been erected to completely furnish the tower. The time is shown on a handsome dial 5ft. across, and the hours are struck upon the largest bell. The movement of the clock has been made to the designs of Lord Grimthorpe by John Smith and Sons, of Derby, who are also now making the great clock for St. Paul's Cathedral.

The new mission room, Nottingham, is being warmed and ventilated by means of Shorland's patent Manchester stoves, the same being supplied by Mr. E. H. Shorland, of Manchester.

A crematorium has just been opened at Manchester. It has been built from designs by Messrs. Salomons and Steinhilf, of that city, and the Roman mosaic floors and niches for the urns have been executed by Messrs. J. and H. Patteson, of Oxford-street, Manchester.

The City Commission of Sewers resolved, on Tuesday, to widen Blomfield-street to 45ft. throughout, the opportunity being presented by the pulling down of Finsbury Chapel. The improvement is estimated to cost £9,000.

In the dome of St. Paul's workmen are now engaged in placing statues in the niches that have been so long waiting for them. A marble statue of St. Chrysostom, heroic in size, the first of eight to be placed in the niches in the pendentives, has been successfully raised to its lofty position, 135ft. above the floor. The sculpture—the handiwork of Mr. Woodington—was in two parts, together weighing about four tons.

The Duchess of Devonshire laid on Friday the foundation-stone of the new Deaf and Dumb Institution at Derby. The site in Friargate consists of two acres, the building will accommodate 100 pupils, and the estimated cost is upwards of £12,000.

A smoking concert was given on Friday evening at St. James's Hall, by the members of the Surveyors' and Auctioneers' Clerks' Provident Association and their friends, when between 500 and 600 persons met, under the presidency of Mr. R. R. Collins. This Association provides for allowance to members in sickness, allowance on death, medical advice, superannuation of members over 70, relief of members in distress, and of widows and orphans. The invested funds of the association amount to £2,700.

COMPETITIONS.

BEXHILL-ON-SEA.—The assessor appointed by the local board to examine and report on the plans sent in for the proposed town-hall has reported that, with the exception of two of them, none can be carried out for the amount limited by the Bexhill local board (£3,300) with 10 per cent. added, and that, with regard to the remaining two, they have, in other respects, so failed in complying with the conditions that he could not recommend their adoption. He has therefore been unable, under the conditions specified, to make any award; but he suggested to the board the propriety of their increasing the estimated amount to be expended to £4,500. The board have decided to alter that condition in their instructions, in accordance with the assessor's recommendation, but without in any way pledging themselves to carry out the work, and without the 10 per cent. limit. Under these circumstances, the clerk to the local board has written to all the competitors, informing them of the change, and inquiring whether they are willing that the plans already deposited should be left for competition at the increased estimate of £4,500, or whether they desire to send in any alternative or additional plans, which in that case must be sent in on or before Monday next, the 14th inst. Some of the competitors have agreed to leave their plans to stand their chance; but others have replied, pointing out that the extended time (a fortnight) is quite insufficient for recasting the plans, and urging that a fresh competition on new lines would be more equitable.

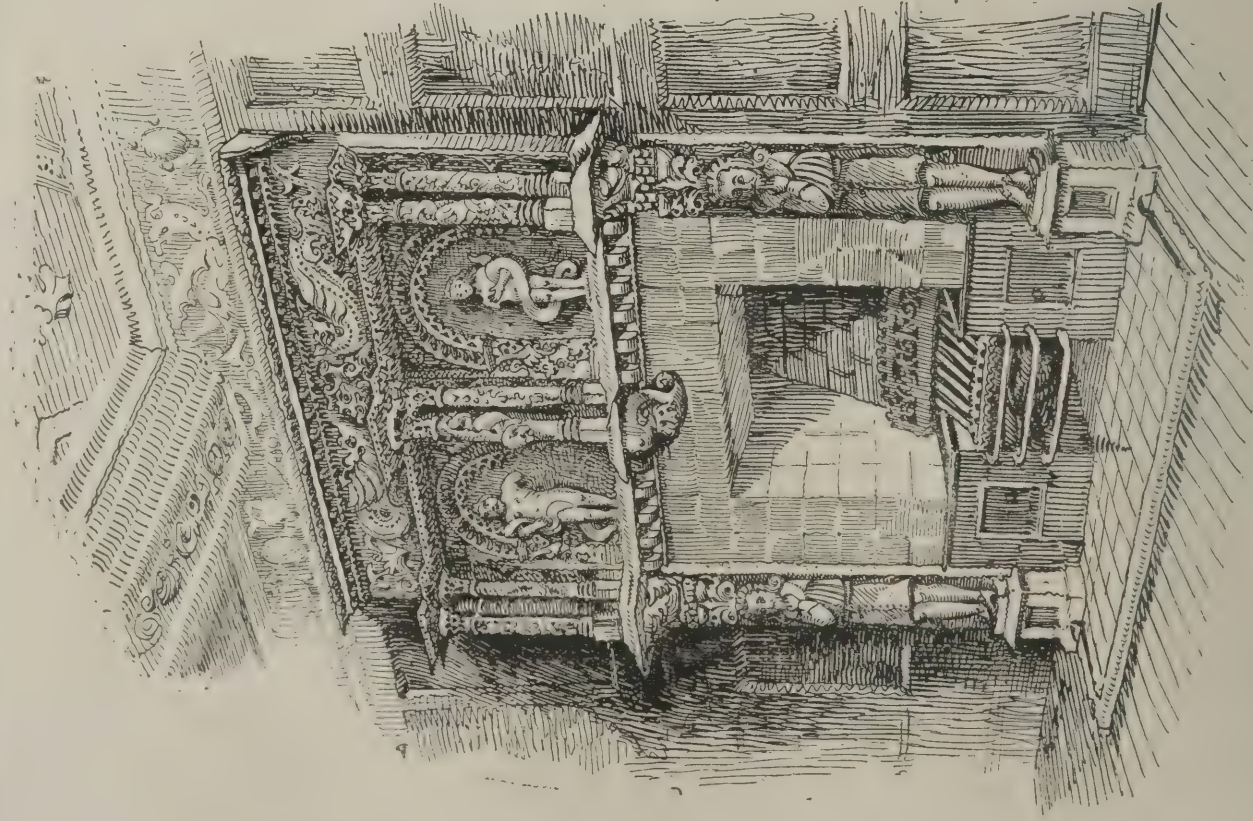
BLACKBURN.—In connection with the Forward Movement of the Baptist denomination it was recently decided by the county division to erect a new chapel and school in Blackburn. Invitations were sent to the following architects to compete for same:—Messrs. Morley and Woodhouse, of Bradford; Mr. Baines, of London; Messrs. Stones and Gradwell, Messrs. Simpson and Duckworth, both of Blackburn; and Messrs. Briggs and Wolstenholme, of 3, Lord-street, Liverpool, and Richmond-terrace, Blackburn, all of whom complied with the invitation. The committee have unanimously selected the designs sent in by Messrs. Briggs and Wolstenholme, and building operations will be commenced without delay. The chapel will be situated at the corner of Granville-road and Leamington-street, being part of the field until recently used by the Blackburn Rovers' Football Club; it will accommodate 700 worshippers, and will be constructed of brick with stone dressings. It is in the Romanesque style of architecture. The cost, including the school building, will be over £5,000.

ILFORD.—A competition is now pending at Ilford, and 67 sets of designs have been sent in. The building contemplated comprises local board offices of the usual kind and a fire-engine house. The work probably will cost £5,000 or £6,000. The award has not yet been made, and the matter is in the hands of the assessor, Mr. G. T. Hine, F.R.I.B.A., the architect of Claybury Asylum.

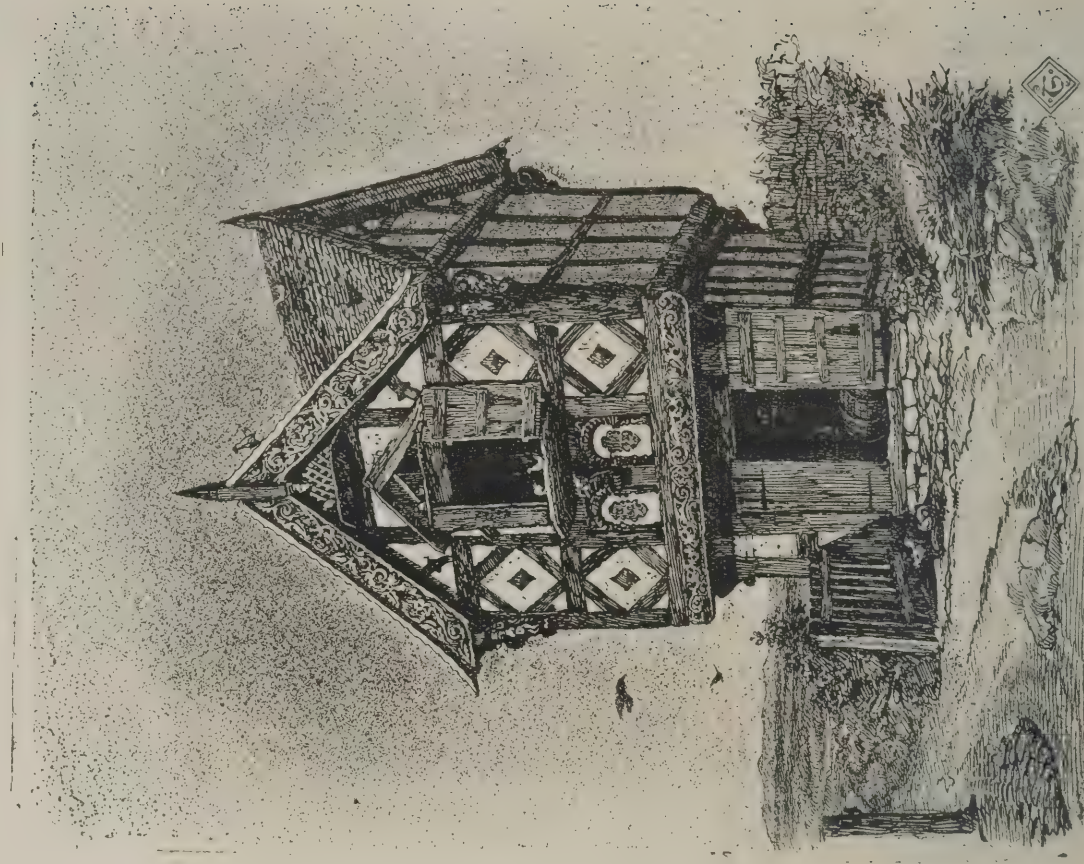
At the inaugural meeting of the Yorkshire College Engineering Society, held last week, Mr. G. Watson, of Leeds, read a paper on "The Disposal of Town's Refuse." Mr. Watson denounced large ashpits and the accumulation of filth, and arrived at the conclusion that the burning of refuse, with its various defects, was the best method of getting rid of material detrimental to health.

The London County Council discussed on Tuesday the proposal of a joint committee that, in the Bill to authorise the construction of a new street from Holborn to the Strand, power shall be taken to tax "the ground values of property within the county of London." Ultimately it was resolved to add to the recommendation authority to prepare a separate Bill for creating an improvement rate on owners of property, and that out of such rate provision should be made for the payment of one moiety of the cost of improvements. Thus amended, the recommendation was adopted.

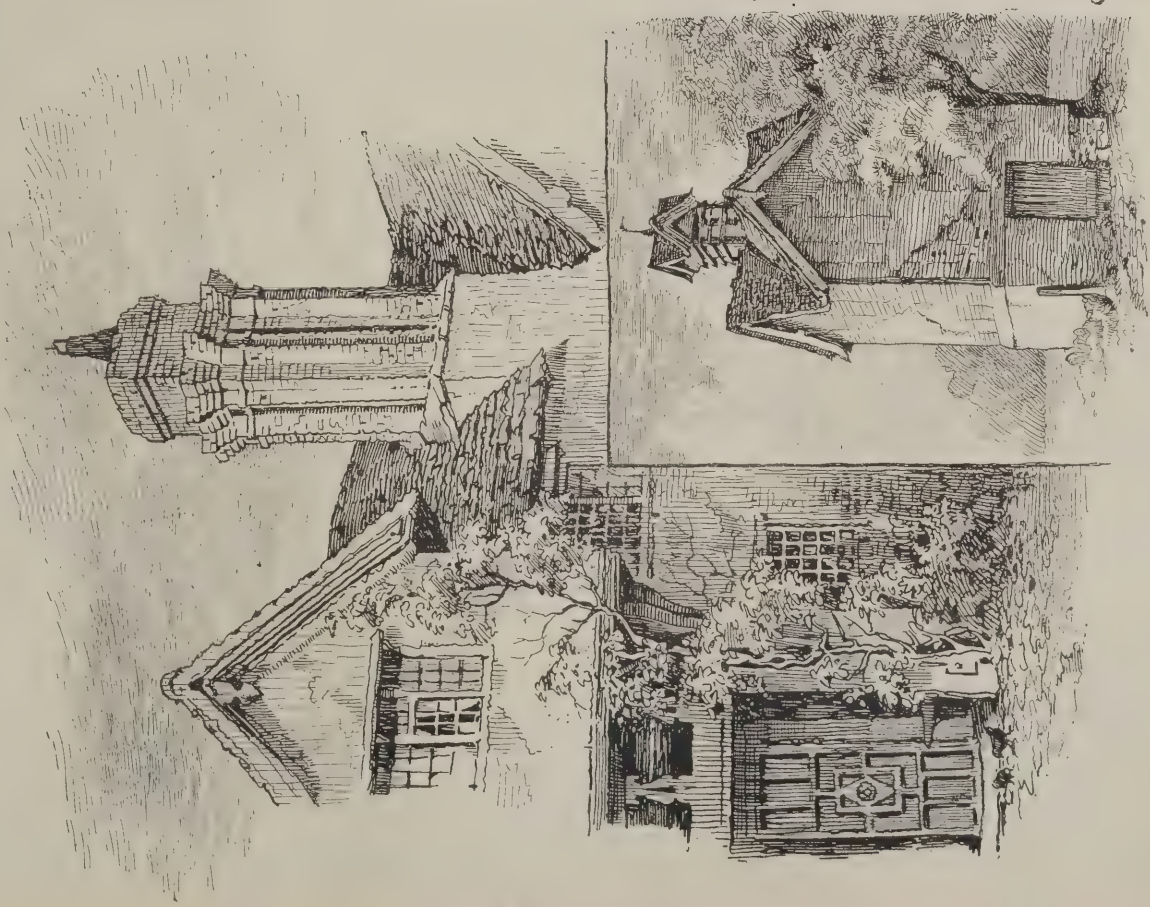
On Tuesday week the Bishop of St. Asaph consecrated the parish church of Hirnant, Montgomeryshire, which has been rebuilt on the site of the old church, of which the foundations only remain. The materials for the stone dressings and timbered roof of the new church were taken from the old parish church of Llanwddyn, which was dismantled, its walls being shattered by dynamite, and its foundations are now covered by the waters of Lake Vyrnwy. The architects were Messrs. Booth and Chadwick, of Manchester and Colwyn Bay, and the builder Mr. W. H. Thomas, of Oswestry.



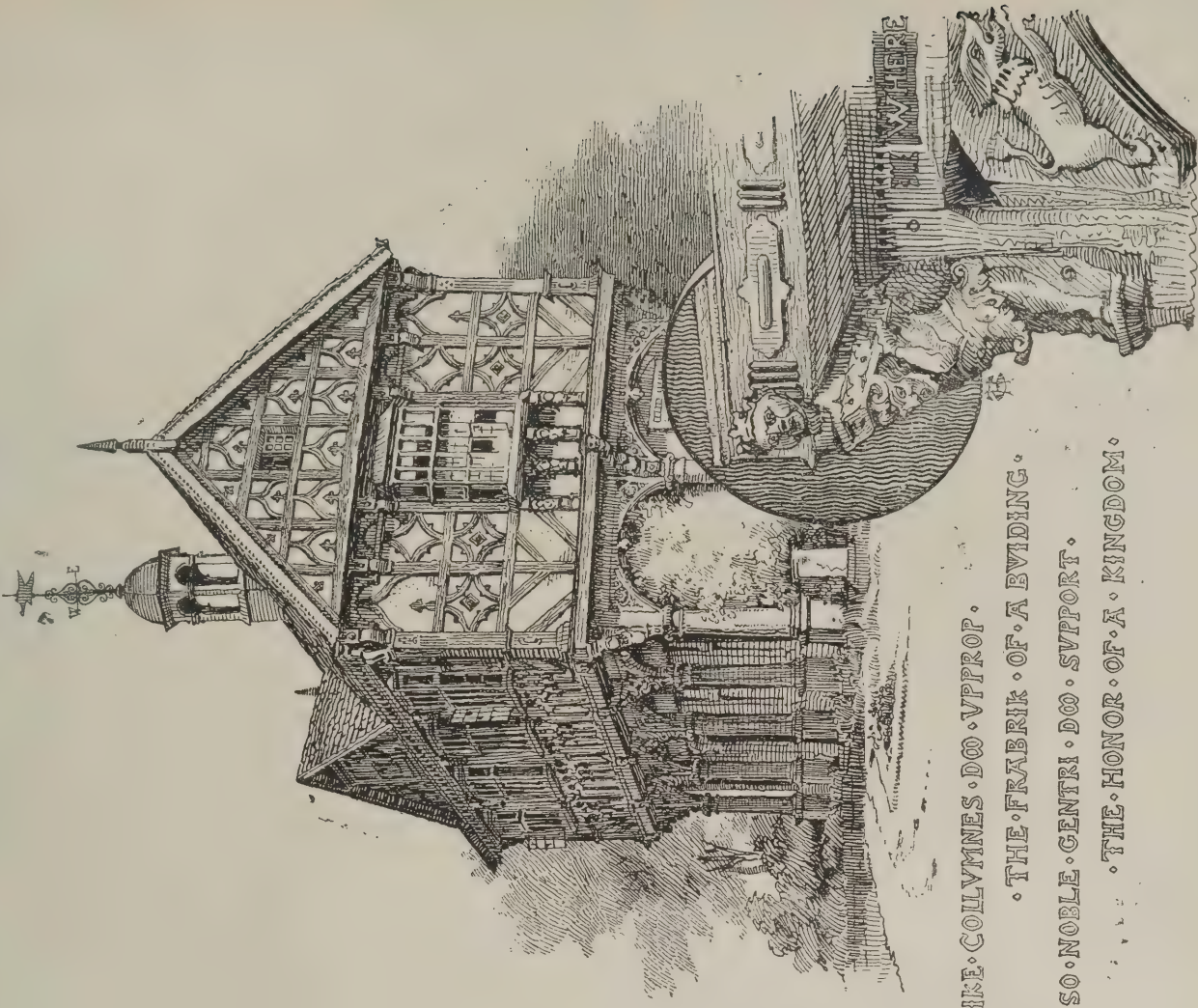
MANTELPiece AT THE RODD.



PIGEON HOUSE AT THE BUTTAS.



PRIOR'S MOOR, HEREFORD.



• LIKE • COLUMNS • DO • VPROP •
• THE • FRABRIK • OF • A • EVIDING •
• SO • NOBLE • CENTRI • DO • SVPPORT •
• THE • HONOR • OF • A • KINGDOM •

THE GRANGE HOUSE, LEOMINSTER.

WAYSIDE NOTES.

I AM glad to see that the School Board is about to give the "outside architect" a chance. General Moberly's proposal will be welcomed by those with a taste for designing board schools. Although the recommendation of the chairman of the Works Committee was not adopted, as it stood, by the Board, an amendment of Mr. L. Stanley was well received, and this promises to lead to a competition. We may therefore look for its announcement at an early date.

The reason for this move is not very apparent. Possibly the Board wants new ideas. We know how, at the first inauguration of the L.S.B., a competition was held, and thereby the Board got ideas that served them in good stead, and were cheap at 5 per cent. on the outlay on one school. There seems to be a lurking impression among members that the job now proposed should be done for less than 5 per cent. The amendment above referred to proposes that the Works Committee shall explain "whether it is proposed to pay an outside architect the usual professional commission of 5 per cent. on the cost of the building," also "whether the supervision of the work as it proceeds is to be under the assistant architect for buildings, and the other officers of the Board, or to be independent." I fancy that if the Board desires respectable architects to compete they had better say definitely that the winner of the competition shall carry out his own work, and that the assistant architect for buildings and other officers shall look after their own business.

Some architects have to put up with much; all with a little. Few have the experience of Messrs. Spalding and Cross at the new addition to the St. James's Baths and Washhouses, Golden-square. The miserable front to these baths may be known to many readers. The commissioners, however, would insist upon the new elevation repeating the old one; and now there is a double range of sham windows with blackened boards behind the glass, and a brick wall behind the boards. I can understand how, at this end of the nineteenth century, readers may be incredulous; but if hard of belief, I ask that they run up to the baths and see for themselves.

The Institution of Civil Engineers opened for the session with an able address from the President, Mr. Harrison Hayter, who spoke of many interesting engineering enterprises in canal, tunnel, and railway building.

Mr. MacVicar Anderson has run full-tilt against draughtsmanship, and done a good work. In his presidential address on Monday evening, Mr. Anderson called attention to this evil, which has grown as a sort of a parasite on the back of honest drawing. It will have surprised many that the president of the R.I.B.A. should have made no direct allusion to the topic of the hour; but perhaps the best way to treat the matter is to exhibit a masterly indifference. It must be owned, however, that many in high places in the Institute have concerned themselves with the complaints of the "Memorialists," and sooner or later there must be some notice taken of the *réchauffé* "Architecture—a Profession or an Art."

It seems rather hard to throw even tepid water on ability in draughtsman. Were the methods of an architect of to-day similar to those of a chief designer or architect of the middle ages, less draughtsmanship would be required. Nowadays the power of drawing well and beautifully is, whatever may be said, a *sine quâ non* for an architect. Great excellence in drawing, too, has this advantage: It leads the draughtsman to invariably design and conceive designs in *perspective*. No great architectural draughtsman draws by habit in elevation—that is to say, when he is scribbling, so to speak, his notions and fancies of architectural composition he naturally represents his ideas in perspective. The tiro will draw in elevation. It is impossible to overrate this habit of drawing and designing in perspective, for while the drawer of elevations may know nothing of the subtle effects of perspective, the faculty for designing in perspective includes the drawing of elevations, and a knowledge of the effect of an elevation in perspective. It is necessary to lay stress on *original design*, and explain that pictorial representation is not meant,

otherwise one might ask why a mere artist cannot, on this line of reasoning, also make an architectural elevation? Whereas we know that an artist who paints cathedral interiors has no faculty for designing, or representing geometrically, such subjects.

A diocesan architect, telling me of the fearful abortions in the way of design that come before him in his official capacity, and thinking of "ghosts" and competitions, said: "If I were assessor, I would have every one of the premiated architects in a room where there was a 'cock-loft.' They should then each prepare a drawing under my observation, stationed in the cock-loft." I told him that the idea seemed excellent, and that it should be duly imported into the "B. N."

I trust that readers saw the leader that appeared in the *Daily News* of the 1st inst., and dealt with the great book. The opening lines were curiously interesting:—"We are not very particular, but it cannot be said that the world is satisfied with its modern architecture. Go to Oxford, look at the old work down to the Jacobean age, and then look at the new at Merton, Balliol, and Christ Church." If there was innocence in the writer, and no bias towards or against any particular architect or school of architecture, it is odd that he should have thus opened his critique.

Mr. Prior's choice anecdotes were quoted. That touching the Gothic clerk, by the bye, will be a favourite one with readers of the essay. It appears that "drawings lately came before a society accompanied by a note from the architect, apologising for their meagreness on the score that 'his Gothic clerk had the influenza.'"

Mr. Prior should be an acquisition at an architects' dinner.

I had always imagined that the keeping of Gothic, Classic, and Queen Anne clerks was a pure invention of those of fervid imaginations. We shall have the plea of illness or indisposition of one or another of these specialist assistants an excuse good enough to put in the building papers soon, wherever an elevation of some city building does not come up to general expectation. It was my idea that specialist assistants were confined to the "washing" gentry. The office staff I always imagined to be quite cosmopolitan, and *au fait* at one style as another, a cathedral or prison making no difference, and being equally acceptable in the drawing office, whether in Classic or Gothic garb.

I have heard of mysterious changes in the style of even well-known architects when their head assistant has been changed. Mr. Blank has been a well-known worker in 13th-century Gothic, and of a sudden his head man leaves from some cause, and a new assistant appears. It certainly, in such cases, is a remarkable coincidence that Mr. Blank's style veers round like a weathercock, and his new jobs appear in the strictest of Classic dresses. I suppose it is because the new assistant has powers of persuasion, and brings his master round to his views. What other explanation is forthcoming? The idea that our good friend never does any of the designing himself, but leaves everything to his assistant, is not to be thought of for a moment. It is preposterous!

"Architecture—a Profession or an Art?" would have been a good title for a banner in the show of the 9th. Well supported by the "Memorialists," it could not but have proved an attractive feature to the public, and the profession would have attended the show to a man. It seems a chance missed.

GOTH.

The doubling of the short section of the Cornwall Railway between Par and St. Austell was commenced on Monday by the contractors, Messrs. Strachan, of Cardiff.

Memorial stones were laid on Thursday in last week of the Hope Presbyterian Chapel at Merthyr Tydfil, now being rebuilt from designs by Mr. Roderick. The building will be Gothic in style, and built of blue Pennant stone with Grindsel stone dressings. In the basement is a lecture-hall 49ft. 6in. by 38ft. 6in., and classrooms, and over these is the chapel, 60ft. by 39ft. in the clear, and seated on ground floor and gallery in pitch-pine. The contract has been taken at £3,200.

Engineering Notes.

SOCIETY OF ENGINEERS.—At a meeting of this society, held at the Town Hall, Westminster, on Monday evening, Mr. Joseph William Wilson, jun., president, in the chair, a paper was read by Mr. W. H. Holtum, chief engineer to the Great Northern Railway, on "The Use of Steel Needles in Driving a Tunnel at King's Cross." An additional tunnel, with approaches, has been opened at King's Cross this year for traffic. It is on the western side of the two older tunnels, the first of which was built in 1850. In length each is 527½ yards. The two newer tunnels have a clear width of 26ft., or 1ft. more than the original central tunnel. The three tunnels pass in a northerly direction, level beneath the Regent's Canal, which is supported upon cast-iron crown plates, carrying the clay puddled bed of the canal; thence the rail gradients rise 1 in 371 and 1 in 75 up to the north faces. In the new tunnel an opportunity presented itself for the introduction of a novel method for working out the excavation beneath steel bars, or needles having a thickness of only 2in., in the place of the ordinary timbering, which generally requires 18in. excess of excavation around the extrados in order to build the arch of the tunnel. The first needles used were those patented by Messrs. Jennings and Stannard. These needles were driven by means of screwjacks, and various contrivances were used to fill up the 2in. annular space left over the tunnel when the forward movement of the needles began, the plan ultimately adopted being that of running fine cement concrete along chases left at intervals within the outer ring of the tunnel arch, whereby the chase, as well as the space behind the advancing needles, became filled with an imperishable material, and the subsidence of the surface of ground used as a goods yard was reduced to a minimum not worth serious consideration. Trussed sills were used instead of the usual long rakers to the upper sills of the face-timbering, which left the temporary roads of the tunnel less obstructed, as well as leaving no raker holes in the invert to fill up afterwards. Another introduction, designed by Mr. E. Duncan, to obviate a tendency the needle had, at times, to drop out of place, was that of interlocking the needles so as to form an almost solid steel roofing of 2in. in thickness. Where underpinned piers interposed within the area of the proposed tunnel and prevented further driving, the steel needles were removed and timber bars were resorted to, and built in as the work proceeded. In conclusion, the author referred to the evident economy of this new method of driving tunnels or culverts. The engineer for the King's Cross Tunnel works was Mr. Richard Johnson, M.Inst.C.E., and the contractor was Mr. Henry Lovatt, of Wolverhampton.

CHIPS.

New Wesleyan schools are being built at Pensanoth, Cornwall. Mr. A. S. James, of that place, is the builder.

The Dean and Chapter of Wells are expending £700 in rearranging the cathedral organ, so that it may be as available for services in the nave as in the choir. Donations to the amount of nearly £300 have already been promised.

A new Empire Theatre of Varieties has just been built in Nicholson-street, Edinburgh, from designs by Mr. Frank Matcham, of London. The style is Oriental, both the external elevations and the decorations within being based on Indian motifs. Accommodation has been provided for 2,500, at a cost for construction of £25,000.

The foundation stone of the new gasometer which the Bristol Gas Company are about to erect at Barton-hill, in that city, has been laid this week. It will be one of the largest gasometers erected in the provinces, its capacity being 5½ million cubic feet, those already in existence in the city containing about 1½ million cubic feet. It will be 222ft. in diameter and 150ft. in height, with three lifts of 50ft. each. The contractors are Messrs. Aird and Sons, of Lambeth.

A public clock, with chimes, presented as a memorial to the late Mr. Elymas Wandsworth (County Councillor and first chairman of the Cleckheaton Town-hall Committee), by his two sons to the town of Cleckheaton, and erected in the tower of the new town-hall, was formally started on Saturday afternoon. Messrs. W. Potts and Sons, of Leeds, were the makers of the clock, which has three external dials, and is fitted with the Cambridge chimes.

Building Intelligence.

BATTERSEA.—The foundation stone of municipal buildings for Battersea was laid on Monday. The buildings will occupy the summit of Lavender-hill. The architect is Mr. E. W. Mountford, and the builder Mr. W. Wallis, of Balham. The buildings will cost over £26,000, and are Modern English Renaissance in style. The materials employed are red Suffolk bricks and Monk's Park (Bath) stone for the walls, the roofs being intended to be covered with thick green Westmoreland slates. The frontage to Lavender-hill is 110ft., the principal entrance being in the centre. The entrance hall measures 54ft. by 30ft., and round it are grouped offices for the transaction of the business of the Vestry and board of churchwardens and overseers. The grand staircase to the first floor springs from the entrance hall facing the vestibule, and will have balusters of pink Devonshire spar, the plinths and hand-rails being of polished Devonshire marble. The council chamber, which will occupy the front central position of the first floor, will be 54ft. by 35ft., and will have a committee room at each end. A large gallery is to be provided in the council chamber for the accommodation of the public, which will be approached by a separate staircase from a new street on the eastern side of the buildings, and by a corridor on the second floor. The large public hall is to be in the rear, with a separate grand entrance from the Town Hall-road, and will have other entrances also from this road, and from the footway which extends along the whole of the western side of the buildings. This hall will be 117ft. by 55ft. 6in., and will seat 1,200 persons. Beneath the large hall there will be a smaller hall measuring 55ft. by 38ft. The contractors for the whole of the constructional ironwork are Messrs. W. H. Lindsay, Neal, and Co., of Paddington Iron Works. We illustrated the buildings in our issue of Dec. 11, 1891.

BEXHILL-ON-SEA.—At the parish church of St. Peter last week, an altar, reredos, and other memorials were dedicated, and also a new organ, with oak case, built by Messrs. A. Hunter and Son, of High-street, Clapham, S.W. The various works have been carried out from designs and under the supervision of Mr. Thomas Garrett, F.R.I.B.A., of Percy-road, Shepherds' Bush. The reredos, with its wings, extending across the eastern end of the church, is of English oak. In a long recess above the super-altar is a representation of the Last Supper in high relief, and over this is continuous canopy work. The wings are of wainscot panelling. The reredos, sedilia, credence-table, and prayer-desk, all of carved oak, have been executed by Messrs. Harry Hems and Sons, of Exeter. The space within the sacrum has been laid with marble pavement, and is approached by marble steps, supplied by Messrs. Farmer and Brindley, of Westminster. The choir has been paved with coloured stones, including Portland, Hopton Wood, Newbiggin, and Warwick, by Mr. C. F. Bridgman. A wrought-iron screen and gates are the work of Mr. J. Avery, of Kilburn, and the Communion rail and altar ornaments are by Messrs. Hart, Son, and Peard, of Regent-street, W.

GATESHEAD-ON-TYNE.—The foundation stone of the new Ellison School, Hopper-street, was laid on Monday by the Mayoress. The school is to take the place of an old building in High street, and is part of a scheme for the extension of Holy Trinity Church. The contract for the school has been let for £1,150, and the estimated cost for the enlargement of the church is £3,000. The designs for the school show a building simple in treatment, and built of brick, with stone dressings. It will be at the east end of the church, and will be a one-story building. The architect is Mr. Stephen Piper, M.S.A., Westgate-road, Newcastle, and the contractors are Messrs. Anderson and Slater, Newcastle. The work will be completed in March next year.

GARTLOCH, GLASGOW.—The memorial-stone of the new asylum which is at present being erected at Gartloch, about six miles north-east of Glasgow, by the City of Glasgow District Lunacy Board, was laid on Tuesday. In 1889 the estate of Gartloch, consisting of 347 acres, was purchased by the board at a cost of £8,500, and in June two years later the work of erecting the new asylum was commenced. Messrs. Thomson and Sandilands, of Glasgow, are the architects. It is expected that other three years will elapse

before the building will be completed. Four of the principal wards of the asylum are now nearly finished, and the work of erecting the administrative and official buildings will next be taken in hand. Constructed on the pavilion plan, the asylum will consist of nine large blocks, all connected. The stone used is red sandstone, while the style is Early French. The cost is estimated at about £150,000, and there will be accommodation for over 500 patients. We illustrated the building by plans in our issue of Dec. 11, 1891.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—At the opening meeting of the session held on the 1st inst., the President (Mr. W. Hale, F.R.I.B.A.), in the course of his address, pointed out that the most notable thing accomplished by that association during the past year was the arrangement with the Birmingham Municipal School of Art, whereby the architectural work, while still remaining under the control of the able masters who had in the past conducted it, has been supplemented, and concentrated into a definite course of architectural study extending over a four-years course. There was great reason for congratulation in the facts that so able a lecturer as Mr. W. H. Bidlake had been found in the Association to undertake the special lectures on architectural design, and that his lectures had been so well attended. Though it has been impossible to do more this session than carry on the classes of design and construction, it was the wish of the council to see other special classes started as soon as the number of students able to attend them justified their institution.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The opening meeting of the Association was held in the Royal Institution, Princes-street, on Wednesday evening, Mr. W. Wybrow Robertson, president, in the chair. The prizes in connection with work classes for sessions 1891-92 having been distributed, the president delivered his opening address, taking as his subject our duty in respect to ancient buildings.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The opening paper of the session was read on the 8th inst. by Mr. J. B. Mitchell-Withers, F.R.I.B.A., its subject being "The Works of Sir Christopher Wren, with a few Notes on some of the Principal Domed Churches of Europe." The early history and education of the great architect was briefly sketched, after which the reader proceeded to deal with a few of his architectural works, commencing with the chapel of Pembroke College, Cambridge, his earliest building; the Sheldonian Theatre, Oxford; the well-known library in Neville's Court at Cambridge, and other minor works. From the numerous churches erected in London he selected the steeple of St. Mary-le-Bow, Cheap-side, and the interior of St. Stephen's, Walbrook, giving in each case the criticisms of the principal writers on architecture, notably those of Elmes, Fergusson, Gwilt, and Wightwick. The lecture was illustrated with a number of lantern slides. On the motion of Mr. C. Hadfield, seconded by Mr. H. W. Lockwood, a hearty vote of thanks was awarded to the lecturer.

CHIPS.

At the annual meeting of the West Ham Corporation on Wednesday, the retiring Mayor unveiled a life-sized portrait of the late Mr. John Meeson, the first mayor of the borough, painted by Mr. Granville Manton, of Westbourne-grove.

At Thursday's meeting of the London School Board it was reported that Mr. W. C. Beaumont had notified that he is in possession as receiver and manager of the firm of Messrs. J. W. Hobbs and Co., Limited, the contractors for the erection of the Choumert-road School, Peckham, and that the erection of the school is being continued by Mr. W. C. Beaumont.

At the meeting of the local board for Rothwell, West Riding, on Monday, the selection of Mr. F. Greenwood as surveyor and inspector was confirmed, the present surveyor, Mr. Lewis Starkie, having been appointed district surveyor under the Lincolnshire County Council. A suitable site having been purchased for the purpose, it was resolved that Messrs. T. H. and W. E. Richardson be appointed architects for the erection of the new board offices in Marsh-street. Mr. Cogill, of Stourton, was appointed architect for the infectious diseases hospital.

Correspondence.

REMAINS OF ANCIENT PAINTINGS AT CANTERBURY.

To the Editor of the BUILDING NEWS.

SIR,—It may interest your readers to have some description of the ancient mural paintings recently discovered in the Church of St. Nicholas, connected with the Lepers' Hospital at Harbledown, near Canterbury. Immediate steps being deemed necessary for the preservation of these paintings, the most important of any that have been uncovered here from their thick coat of whitewash, I have had a favourable opportunity of carefully examining the works while treating them with a preservative solution, this having as a first result a deepening and brightening effect upon the colours, and enabling one to decide from the details revealed that the subject represented was the Annunciation. The two figures are on opposite splay of the east window, and stand under canopies of ogee form, flesh, draperies, and ornament alike painted in black, outlined with white, on a dull-red ground, the bold and simple treatment employed reminding one not a little of a rubbing from some monumental brass. The angel to the left of the window, slightly the smaller figure, has one wing raised crossing behind the white nimbus; the right wing turns towards the edge of the splay, and is rather indefinite. As the right arm crosses the figure, there is a blank space cutting off the raised hand at the wrist; this gap perhaps indicates that once there was the return of a scroll here, vestiges of which appear depending by the side of the gathered robe, although there is no inscription discernible to make the suggestion a certainty. The figure of the Blessed Virgin is as well posed as that of the angel; a book is clasped upon her breast, while at her feet, a little to the right, is a vase of considerable size, one handle of which forms a conspicuous element in the design. From the vase a blank space reaches to the Virgin's elbow, but here a flower and bud indicate an origin in the vase below. More confirmatory of the nature of the subject still is the emblem of the Holy Spirit a little to the right of the nimbus, and placed as though the Dove came from the window.

These paintings were probably executed in the 14th century, possibly soon after the chancel was reconstructed. It may be remembered that westward the style of the church is generally Norman.

I may mention also here that the doubt as to the nature of the subject painted on the south wall of St. Alphege Church, Canterbury, seems likely to be cleared up. This work having shown unmistakable signs of rapid disintegration, it has been treated with a preservative mixture. Under this details have become manifest that seem to indicate that any idea of connection with either the history of St. Alphege or St. Etheldreda must give way to the simpler explanation that the picture represents the Adoration of the Magi. It evidently covered at one time an area of wall that in later times has been pierced with a window. This painting is probably of 14th-century date.

The mural decorations in the hospital at East-bridge, which represent portions of a Martyrdom of Becket, a Last Supper, and Our Lord in Majesty with the Evangelical Emblems, have suffered much from exposure to the air since their discovery in 1879 behind and above the old fireplace, now removed, and their structural restoration by Mr. Neale. Fading gradually but surely away, these works have shown some signs of revivification under similar treatment to the paintings at St. Alphege and St. Nicholas.—I am, &c., PHILIP H. NEWMAN.
21, Endsleigh-gardens, N.W.

OPENINGS FOR THE ART WORKMAN.

SIR,—I read the article in your issue of the 28th ult. with much interest; but the question at once presented itself—Does the art workman exist? There may be a few lingering specimens of this genus, but as a race the art workman is dead. There are too many opposing factors at work to admit of his cultivation. Trade Unionism does not encourage the production of the artist. Competition is against his growth. The pace at which we live will not admit of his development, except in isolated cases, too isolated to count on.

The true art workman was the man who conceived and executed his own conception, instead of murdering someone else's. He corrected and remodelled it where necessary as it progressed, sparing neither time nor thought in its production; such men are inconsistent with the present age. The times do not produce them, or, if they do, starve their own offsprings. We must recognise the fact that we live in a mechanical age, and, having recognised it, take the best means of utilising what we have. It is an age of machinery, and man has adapted himself to the age, and, generally speaking, becomes a machine, with all its hardness, and little of its accuracy.

The few artists, instead of being art craftsmen, must be the machinists, to influence and guide the mechanical powers at their command.

The state of many manufactures, as you say, is deplorable, and much of the obtrusive worthlessness is due to modern innovations. Amongst them the "exhibitions" have done much to foster the abandon of the "ornamentist." Manufacturers, instead of considering the common fitness of things, have vied with each other to attract attention where all is obtrusive, with the inevitable result of producing vulgar novelties, instead of art products. The gigantic show-rooms are a milder form of this evil. Everything may be artistic if kept subordinate to its use; but exhibitions, show-rooms, and plate-glass windows are opposed to this essential art maxim, because their one object is an assertive one.

The designer is not wholly to blame; he has to live, and the designer of the manufacturer is too often only a draughtsman, without practical knowledge or experience. What is wanted is that the designer should be the ruling spirit, not the servant. It is difficult for him to combat popular taste or fashion, much more difficult if he has to do this through a third and interested agent. The demands of the manufacturers are, Give us something that will sell, never mind whether it is true to art principles. The one object of the age is to make money.

You speak of the ironfounder's mixture of Gothic and Classic details in the same article, and wonder why it is so. Generally the answer is simple enough. He has a Classic pattern and a Gothic pattern; his customers want a new design—they always do—and want it cheap. To meet this demand he cannot pay for design or pattern-making, so the bad patterns of existing articles are cut up, and a little of this and a little of that is used until a "new and original" article is produced, without the necessary expenses. This is one cause for the heterogeneous things called ornamental metal-work. It is not confined to the ironfounder; but you must not blame the manufacturer for covering his cheapest products with a multitude of bad ornament. Ornament covers and hides bad work; bad ornament is cheaper than good, as weeds cost less to produce than stove plants. If you want plain things, you will necessarily have to pay a little more for them. Firstly, the material and workmanship must be better. It is this exacting demand for cheapness that must be held responsible for some of the monstrosities. Mantel shams are produced as low as 3s. 4d. each retail. Can you expect an art product for this sum?

Your argument that the general run of stoves are spoilt by over-ornamentation is good, and in the more expensive work is unanswerable. Yet there are plenty of good designs at a fair and moderate cost; but your everyday builders' ironmonger will not have them; they are not attractive and assertive enough for his show-rooms, and they do cost a little more in consequence. Pattern-making is an expensive process; the cost of patterns has to be spread over the number sold; and it is a deplorable fact that the general public likes plenty for its money, whether in ornament or other things, and the builders' ironmonger recognises this in his selection of stock. Consequently the educated taste must pay a little more for its specialities, because its requirements are small as compared with the wants of the legion of the uneducated. As another example of vitiated taste, take the enamel slate chimney-pieces. Why do these sell? There may be an excuse for the cheaper productions in this material; but why do the expensive things get into houses that have cost over £1,000 to build, chimneypieces retailed at £7 to £10? The answer is, because the gaudy inclination of an inartistic age wants ostentation, not art; its appetite is ravenous, not epicurian. The fault lies with the consumer. Good designs in cast iron

can be had at fair prices; but in this, as in other things, if you want bulk you must take an inferior quality. Still I agree with you, the general ironfounder is not an artist, nor, on the other hand, is he a philanthropist. He is what the times have made him. If you had an artistic people, artistic ironfounders would follow as a matter of course.

You say wrought-iron work is taking the place of cast for the fireplace. I am as much interested in wrought as cast iron, yet I think it is a bad change from a practical point of view. You would not advocate the use of wrought iron on the sea-coast for outdoor work. For an equally practical reason, cast iron is better for the firegrate; its skin is harder, it does not scale, nor is it so liable to twist under heat. Many of the wrought-iron productions of the present time, though pleasant to look upon, are not serviceable, being altogether too light for practical use; therefore, from the soundest of all art doctrines, "the common fitness of things," they are not artistic.

It is the same influence that is at work in the marble trade. As you say, the ugly trusses do not support the shelf; they are placed there to satisfy the consumers' desire for something bulky and ostentatious. If they were structurally introduced, they would necessarily cost more than those stuck on with plaster, and would cease to be a saleable commodity on a large scale, against their dishonest rivals. There is even a more hideous form of marble mantelpiece being sold to-day in thousands (the marble trade is by no means dead). The truss is replaced by what is known as a drop column. This is comprised of a square block of white marble, with a red pimple on its face, then a pretence of a moulding, then a short column of alabaster, or yellow, finishing with a lump of white with a second pimple. This would-be shelf support is made of about ten pieces of marble, and most of these chimneypieces are produced, not by machinery, but by the hands of English masons, not even imported from Belgium.

The age is an economic (?) age; marble to be worked on your lines is not a cheap material, and until the public are prepared to be more generous they will have to put up with the false construction, or leave marble chimneypieces alone.

Marble can be used to advantage, and economically, by making more of a feature of it in the linings or interiors of wood chimneypieces, where it would be useful, ornamental, and honest.

We do not live in an art age, nor can I agree with the optimists that there is any material improvement in the public taste. There appeared to be an improvement some years ago; plain goods were eagerly sought after, and everyone was talking too too utter art nonsense. Manufacturers were naming their goods with nomenclature that might have been Hebrew from any significance it had to their minds, except as a catch phrase; but it was all a craze, all a fashion. The same motley crew are now rushing after the Rococo with the same eagerness that they sought the so-called Early English. Satiated for a time, they took plain food; the nausea passed, and they are ready to swallow the most offensive art diet you can give them.

But, sir, the architect who can perpetrate such designs as the drawing-room designated "Free Classic in Extremis," illustrated in the same issue as your article, is far more responsible than the ironfounders, who do such things "because they know no better," and I regret that your condemnation was not an unqualified one. This craze for Rococo has been growing for some years. The cabinet-makers and upholsterers caught the complaint at the Paris Exhibition, and it has been spreading from trade to trade, until, as I learn from your valuable paper, the profession has caught it, like the doctors catch influenza. Still it is not a thing to despair over. Let us give those who will have it good work, fit for its uses; the others will go their own gait, and wallow in their own abominations.

"For every evil under the sun
There is a remedy, or there is none,
If there is one, try to find it;
If there is none, never mind it."

—I am, &c., JOHN WARD.
24, Quadrant-chambers, Birmingham.

A branch of the General Union of Operative Carpenters and Joiners was formed last week at Tunbridge Wells.

Intercommunication.

QUESTIONS.

[10883].—**Spring Ball-Room Floor.**—Will someone kindly give me information with reference to the following:—(a) What is the best method of constructing a spring ball-room floor? Size of room about 85ft. by 25ft. (b) What was the method used from 12th to 15th centuries in heating the old churches, or where could I obtain information with regard to this subject? (c) What books on drainage is it advisable for an architect to study in addition to Baldwin Latham and Hellyer?—P. Q.

[10884].—**Framing.**—What is the best method of sanding external wooden framing, so as to resemble stonework?—R.

[10885].—**Ants.**—An alteration was made to some premises annexing the adjoining property (a dwelling house), and building therein a patent baker's oven, which was covered with sand; ever since this oven was started the premises have been overrun with millions of small ants, until the place is infested with them. Whether or not the ants were brought in the sand is a question. I should be glad if any of your readers can give me a recipe for exterminating these pests?—BOTHARD.

REPLIES.

[10873].—**Boasting.**—Your correspondent "who does not mind telling" should be more careful, and first be sure that what he says is worth "telling." "Boasted," or, more properly, "bosted," work is not as he describes, but is the exact kind of work which he ascribes to the incompetent man, and is in many cases specified to be done to an angle of 45°. It is not done on any given number of "lines"—really "blows," to the inch. This is nearly always regulated by the texture of the stone used. If it is hard and fine there will be really more than 8 blows to the inch; if soft and more easily worked, very excellent bosting is done at 4 or 5 blows to the inch. The kind of work he describes as "boasting" is really known as "tooling." Fancy the extra labour and tediousness involved in covering an extensive surface with "lines" or "blows" with a tool 2½ in. or 2 in. wide. The work he describes as "boasting" is usually done with a tool 4 in. and up to 5 in. wide, thus securing more uniformity in the work. Bosted work is really chiselled, but the stone being first "broached" or pointed, and next dressed with a chisel about 1 in. wide, is then ready for "boasting." It is sometimes known as "dressing," but as masons call their wide tools (not too tools) "bosters," to distinguish them from others, it is more commonly called "boasting" or "bosting." This is the custom in the Midlands and the North of England. It is not so prevalent in the South on account of the extensive use of Oolite limestone, which are usually sawn and then "dragged" smooth. These are sometimes "bosted." The stones which are usually bosted are hard limestones and grits.—A MASON.

[10878].—**New Lights in Old Boundary Wall.** An adjoining owner has legally a perfect right to break out new windows in his boundary wall; but "Legal" has also a perfect right to prevent him seeing anything out of his new windows. From the information given on the plan, if "Legal" were to build anything on the yard he would block his own gateway and injure his own windows. The better plan would be to ask the adjoining owner for a yearly acknowledgment for use of light, and if he refuse, then to erect a high hoarding, blocking up the windows, but not touching the adjoining owner's wall.—GILBERT W.

[10879].—**Stucco Front.**—I am afraid that there is no binder which, if put into colour-wash, would make the same adhere to an old painted surface. The better plan for "S. A." would be to remove the old paint by means of one of the many preparations for that purpose, and then to apply the distemper. Let the distemper be washable, and the rain will not be able to wash it off. There are many washable distempers.—DEPUTY B. E.

[10880].—**Fireproof Floors.**—Besides the better-known patented systems of fireproof floors, iron or steel joists embedded in concrete are much used. A better and more economical method of constructing concrete floors, which eliminates the destructive iron girder, is described in my specification of Letters Patent No. 1415, 1892.—F. G. E.

[10882].—**Water-Pipes.**—"Inquirer," Messrs. E. Walker and Co., of High-street, Heckmondwike, Yorks, are the patentees of a tin-lined high-pressure water-pipe, termed "the health pipe," which has been found to resist the actions of waters brought from all parts of Great Britain and Ireland. High authorities on the pollution of water by lead have certified there is no action by water on the tin used in the lining of these pipes, which are tested to resist an extremely high pressure.—HY. STEAD.

[10882].—**Water Pipes.**—Several methods have been proposed for coating and lining the insides of lead pipes to prevent the water conveyed from acting upon them. Most of them are objectionable, though, of course, some are successful. Among the latter are the following:—Schwartz's patent: The pipe is boiled in sulphide of soda for 15 minutes, by which the interior is coated with sulphide of lead (a substance insoluble in water). Haine's patent: This consists of an inner pipe of block tin, encased in a lead pipe. The two metals are so united that no joint between them is perceptible, and they cannot be separated by any amount of bending or twisting. In consequence of the tin melting at a lower temperature than the lead, it is somewhat difficult to make a soldered joint in these pipes; however, it may be done with care. This tin-lined pipe has been found to be entirely successful where the water is so soft that it acts upon lead. As these pipes are stronger than ordinary pipe, it may be of less weight per yard for water supply for any given pressure. "Inquirer" will find the whole subject discussed in Parkes's "Hygiene," and in "Lead Poisoning of Water and Its Prevention," by A. McGordon.—DEPUTY B. E.

[10882].—**Water Pipes.**—I should say patent lead-lined block-tin pipe, providing care is used in making

the joints. Galvanised wrought-iron tubes are frequently used; it is said, however, that some waters act on the galvanising. Glass-lined pipes can also be procured, and I should be glad if some reader who has had experience with them would give his opinion.—N. B. D.

CHIPS.

On Sunday, November 8, the Bishop of Reading dedicated a new reredos, which has been erected in the church of St. Mary, Tingewick, near Buckingham. The reredos, which is carved in oak, has been executed by Mr. Harcourt Runnacles, of Halstead, from the designs of Mr. A. Blomfield Jackson, architect, London.

The trustees of SS. Saviour and Jude, at Anfield, have adopted a plan by Mr. T. G. Ebdy for the rebuilding of the church. The church when erected will easily accommodate 650. Mr. Ebdy's proposal is to take down the present church (but without numbering the stones), to put the red sandstone, which will not stand the weather, inside throughout, build the exterior with random freestone, and adopt Geometrical Gothic, using the columns, arches, and other dressings of the present church for the interior.

The central portion of the modern Caen stone reredos of St. John's Church, Cardiff, has been left vacant and uncompleted since the reopening of the church after restoration in 1887. This has now been filled in, at a cost of £600, with figures two-thirds life size, under canopies emblematical of five dispensations of the revealed faith. In the central niche is our Lord as Melchisedech, and in the side panels are Abraham, Aaron, Isaiah, and Peter. The work has been executed by Mr. W. Goscombe John.

At Marylebone, on Saturday, a German-Pole, Roman Marweg, brought upon remand, was committed for trial on a charge of throwing sulphuric acid on Richard Graefe, cabinet maker, of Bessborough-street, Pimlico, his former employer. Owing to a dispute Marweg was discharged. He went to his late employer's house, and threw some vitriol into Mr. Graefe's face, who was much burned, and lost his right eye.

The Mayor of Newport, Mon., cut on Monday the first sod of the public park presented to the town by Lord Tredegar. The site—2½ acres in extent—has a value of over £30,000 for building purposes. The Corporation have agreed to spend £12,000 in laying it out.

The Cornwall County Council have before them a report from the Highway Committee recommending that the county be divided into five separate highway areas—the three eastern areas to be under the superintendence of Mr. Jenkin, and the two western area under Mr. Hickes; and that a sub-inspector be appointed at £150 per annum for each highway areas, to act under the directions of the respective county surveyors. The committee also recommended that Mr. Jenkin be paid an inclusive salary of £350 per annum as county bridges and main roads surveyor, and Mr. Hickes an inclusive salary of £250 per annum for the like duties.

A bust of Mr. W. E. Morrison, for the past three years Mayor of Eastbourne, was formally placed in a niche on the staircase of the Town-hall on Friday as a permanent memorial of two years of office. It is heroic in size, and has been executed in Carrara marble by Mr. A. Bruce Joy.

Mr. Roberts, C.E., with Mr. William Burns, the law agent of the company, and staff, have completed the preliminary survey of the proposed extension of the Highland Railway from Stromeferry to Kyleakin, opposite the Isle of Skye, and an application will be made at the earliest opportunity to Parliament for the necessary powers.

One of the features of the coming Winter Exhibition of the Royal Academy will be some representative drawings in colours by Edward Calvert, the friend of Samuel Palmer, John Linnell, and others of Blake's set.

The Runcorn improvement commissioners and the Widnes local Board have each unanimously resolved to contribute £30,000 towards the cost of the proposed bridge to cross the Mersey between Widnes and Runcorn, on condition that the County Councils of Lancashire and Cheshire provide the remainder of the cost. The estimate for the scheme is £180,000, of which £140,000 is put down for the structure, and the remaining £40,000 for Parliamentary expenses, and compensation for property to be purchased.

The directors of the newly-established South Wales and West of England Iron Girder Company paid a visit of inspection on Thursday in last week to the works on the East Moors, Cardiff.

A mission-church at Mylor Bridge, Cornwall, was opened last week. It is seated for 240 persons, and has been built from designs by Mr. H. C. Rogers. On the retable is a cross by Mr. Harry Hems, of Exeter, carved out of one piece of oak, and having the crown of thorns surmounted by the crown of glory.

Legal.

SURVEYORS AND MORTGAGES.

WHERE a capitalist advances to a builder upon premises in course of erection, and takes a mortgage to secure himself from the building owner, he should, of course, employ a surveyor upon his own account on whom he can rely. If he does this, and the surveyor is guilty of negligence, the mortgagee will, at all events, have an action for damages against him. But if the man lending the money is unwise enough to act upon the report of the surveyor who is employed by and on behalf of the mortgagor, then the mortgagee will have no remedy in the case of gross negligence so long as no fraud is shown. This state of things was well illustrated in the recent and important case of "Dennes v. Gould" (*Times*, Oct. 31). There one Hunt, a building owner, made a contract with a builder to put up certain houses at Ilfracombe; but having no money himself with which to finance the builder, he obtained advances from the plaintiff, to whom he mortgaged the property. But instead of stipulating that he should only advance upon certificates of some surveyor employed by and answerable to himself, Dennes agreed to accept the report of the defendant Gould, who was the surveyor engaged by the building owner. It was proved that the defendant gave his certificates with great carelessness, and at the hearing before the Official Receiver he was found guilty of gross negligence, though not of fraud, and damages to the extent of £300 were awarded to the plaintiff. But then the objection was taken that there was no contract between the plaintiff as mortgagee and the defendant as surveyor; and so there could be no legal liability, as was decided by the Court of Appeal in the recent case of "Scholes v. Brook" (64 *Law Times*, N.S. 674). It was argued on behalf of the plaintiff that, as the surveyor knew perfectly well he was giving his certificates for the plaintiff to advance upon, especially as he had actually witnessed the execution of the deed of mortgage, there was a duty from the surveyor to the mortgagee, for default as to which he should be made legally liable in damages. But the Court, composed of Justices Wills and Collins, followed the earlier authority quoted. They also held that Hunt, as mortgagor, had employed Gould as the surveyor, and his certificates had been accepted by Dennes, who made the advances. The Court of Appeal had laid it down that there must be a contract of employment between a mortgagee and a surveyor to make the latter liable for loss. If fraud were shown against a valuer in such a case, he could be held responsible as for a false representation. But here, although gross negligence was found, it was not fraudulent, and for this, in the absence of a contract between them, the defendant could not be sued by the plaintiff, who must accordingly put up with his loss.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

QUINTUS MEUS.—BUILDING.—NEIGHBOUR.—Next-door neighbours in town must put up with a good deal of noise and annoyance, and you are legally entitled to alter and repair your own premises, provided that you do the work in a usual and reasonable manner, and at the ordinary times, so as not to become a nuisance.

OWNER.—LEASEHOLDS.—REPAIRS.—As you have let repairs go so long, you can wait until expiration of leases, and then send surveyor. But if there is any danger of loss by the delay you should send in at once under the other powers of entry, and serve notices to repair in accordance with the covenants. You will also be able to go in at end of term and claim for dilapidations afterwards if the repairs are not done.

FAIRPLAY.—TIMBER STAGE.—BUILDING.—The case to which you refer was dealt with in my article headed "What is a 'Building'?" in the *Building News* for Sept. 23, 1892, where a timber stage, partly used as a shop, was held to be a "building" within the Act. Yours appears only to be a stage in connection with a workshop. But all these cases are questions of fact for the decision of the magistrate, though you do not seem to me to be liable.

S. J. R.—PRIVATE STREET WORKS ACT, 1892.—CONSTRUCTION.—As to Section 20, as the word used is "shall," I think the local authority must take it over as required, unless they can show it is not a "street" within the Act, and unfortunately the old definition of the Act of 1875 has not been made clearer. As to Section 22: 1. No. I do not consider the Canal Company would be liable for any portion. 2. They would then be liable as frontagers in accordance with the Act of 1875 and the

cases thereon. 3. The Act only exempts a railway or canal company, as I understand it, for the public good, and I do not think the exemption would extend to private persons in regard to an "arm" of a canal used by them. But, of course, this is an entirely new statute, about which opinions will probably differ.

LEGAL INTELLIGENCE.

PAINTERS CLAIM, AND GET THE STANDARD WAGE.—At West London Police-court, on Tuesday, Mr. Plowden heard three summonses against Mr. David Charteris, a builder and contractor, with respect to the non-payment of the balances of wages claimed by three painters. The men were employed at William-street Board School, the defendant being the contractor for the work, and they claimed to be paid at the rate of 8d. per hour, according to the trade-union rate. It was stated that all School Board work was paid at the rate of 8d. per hour. That was disputed by the defendant, who handed in some time-sheets to show that he paid at the rate of 7½d. per hour. He said leading men received 8d.; but common painters 7½d. only. He did not stipulate to pay the trade-union wages. He had paid the same rate of wages for School Board work for three years.—A clerk of the works in the service of the Board handed in a copy of the contract. There was a footnote governing the trade-union rate of wages. Other contractors signed the conditions, and he believed all other contractors paid at the rate of 8d. per hour.—The defendant said his attention was not called to the footnote of the contract, or he should not have signed the contract. He objected to the Board's dictating between him and his men.—Mr. Plowden said the footnote in the copy of the contract put the defendant entirely out of court. He made an order for the payment of the amounts claimed, with 10s. costs in each case.

SURVEYOR'S ACTION FOR LIBEL.—In the Queen's Bench, on Tuesday, Alfred Moser Hiscocks, the surveyor to the Vestry of St. George the Martyr, Southwark, brought an action for libel against Levi Joseph Dunham, the clerk to the Vestry of St. Mary Newington. The vestry of Newington have a contract with the vestry of St. George, under which the former deal with the street-sweepings of the two parishes at their depot. In a letter to his vestry clerk, defendant used words which plaintiff said imputed that he had some interest in getting the work handed over to a private contractor—a course which had been followed before. The defendant denied that the meaning which plaintiff attached to his words was correct, and pleaded privilege. A settlement was arrived at in court, defendant's counsel repudiating, on his client's behalf, any intention to impute that plaintiff was interested in any contractor or contract, or had done anything unworthy of his office.—A juror was then withdrawn.

EXISTING STREETS AND THE METROPOLITAN BUILDING ACT OF 1878.—ELLIS V. LONDON COUNTY COUNCIL.—This case resulted from the practice of turning residences into shops and using the gardens as the sites of the shops, and turned on the provisions of the Building Act of 1878 as to putting forward the boundary of the forecourt so as to be at a less distance from the centre of the road than is required by the Act. It was an appeal on a case stated against an order of the stipendiary magistrate for Woolwich, under the Act of 1878 (41 and 42 Vic. c. 32, s. 6), requiring the appellant to set back the external fences or boundary of the forecourts or other spaces in front of certain houses or buildings to a distance of 20ft. from the centre of the roadway of Church-lane, Woolwich. The appellant was the owner of a dwelling-house and garden, Cedar Lodge, adjoining Church-lane, up to the time of the erection of shops. There were buildings in Church-lane (all on one side) before 1878, the time of the passing of the Metropolitan Building Act, section 6 of which has a proviso that the construction or extension of any house or building in or abutting upon any street existing, formed, or laid out for building at the time of the Act may be begun and completed as if the enactment had not been made. But the magistrate found that Church-lane was not a street existing at the time of the Act of 1878. In 1855 some houses were erected, and in 1869 the whole frontage of land adjoining Church-lane, immediately to the south of Cedar-lodge, was divided into building plots, and building leases were granted, and in 1870 there were leases of a number of these plots and houses erected thereon. In 1878 about sixty houses were erected. In 1889 the wall of Cedar-lodge garden was pulled down, and a fence was erected on the site of the wall, and this was the fence in question. In 1891 shops were erected. The south blank wall was continued outwards by wall 6in. from boundary of appellant's wall. Between the garden wall and the boundary the fence in question was erected by the appellant on the top of the old wall. The magistrate found—(1) that the fence was part of an extended fence, a boundary of the forecourt or space in front of the appellant's southernmost shop; (2) that Church-lane was not a "street"

"existing" and formed or laid out as for building at the time of the Act of 1878; (3) that the appellant had constructed the southernmost shop so that the boundary of the "forecourt" was at less than the prescribed distance from the centre of the road of Church-lane. And the magistrate accordingly convicted the defendant, who appealed. Mr. R. Cunningham Glen argued for the appellant, and contended—(1) That there was no evidence that the fence was the external fence or boundary, and, indeed, he urged that the evidence rather showed the contrary. On this point he cited "*Meadows v. Taylor*," and "*Hobbs v. Dance*." (2) that Church-lane was an "existing street" at the time of the passing of the Act of 1878. That Act and the Act of 1855 was, he urged, to be read as one Act. And the word "existing" would be unnecessary, unless it meant something different from "formed" or "laid out for building"; (3) that there was no evidence on which the magistrate could find Church-lane not "an existing street" within the Act. Mr. Daldy argued in support of the conviction, controverting the argument for the appellant on these points. In the Public Health Act, 1875, "street" includes any highway not being a turnpike road. He cited "*the Mayor of Portsmouth v. Smith*." This was not a "street" within the exception. After a very long argument on Saturday and Monday, the Court of Queen's Bench came to the conclusion that the order was wrong. Mr. Baron Pollock, in giving judgment, said the contention on the part of the County Council was that this Church-lane was not an "existing street" at the time of the passing of the Act of 1878. The magistrate had, no doubt, found that it was not so, but had also found facts from which the Court could see that it was so, and, therefore, the order was wrong. Mr. Justice Hawkins entirely agreed. Order, therefore, set aside.

ARCHITECTS AND CLIENT IN LITIGATION.—**DENNIS v. CROCKER.**—The adjourned hearing of this claim for five guineas took place at Bodmin County-court on Friday. The plaintiffs, father and son, the former a retired builder and the latter an architect of Birmingham, claimed from defendant, a store-keeper of Bodmin Asylum, £5 5s., charged for the preparation of plans for the erection of buildings. Tenders had shown that the four houses it was contemplated erecting on defendant's property would cost more than it was intended to spend, and a suggestion made that five houses might be built at a reduced cost was agreed on with a limit to price, and the elder plaintiff superintended the erections made from further plans by the younger. When plaintiffs presented their bill an item for £5 5s. for the first set of plans was not paid; all the rest was. There was a counter-claim for £50 for losses and expenses alleged by defendant to have been sustained through negligent and unskilful work. The defence was that the younger plaintiff agreed not to charge for the first plans. The counter-claim defence was that the plans had to be departed from on account of a hedge, which was stated to be included in the property, having been excluded. Judge Granger, in summing up, said with regard to the claim of £5 5s. for the first set of plans, he could not put any other interpretation on it than that if the second set of plans came to about the estimate Mr. Crocker was willing to lay out, Dennis was to get the £5 5s., and he should therefore allow it with costs. With regard to the drainage of the premises, it seemed a most remarkable thing that in a town the size of Bodmin absolutely no by-law existed, and no check was put by the sanitary authority on what people did or how they connected with the main drain. As there had been no evidence on the part of Mr. Crocker to prove the drain had not been properly laid, he had no alternative but to decide that it had. On the counter-claim, although the matter was pointed out to Mr. Dennis, yet Mr. Crocker condoned the matter by paying Dennis his full claim on this account. He therefore gave judgment for Dennis with costs, and dismissed the counterclaim.

DRAINS AND SCARLET FEVER.—**FOSTER v. FARQUHAR.**—The trial of an action brought by Mr. R. C. Foster against the executors of the late Sir E. H. Scott to recover damages for the breach of an agreement to put the drains of a house in repair, concluded on Monday. After the plaintiff had taken possession of a house in Sundridge-avenue, Bromley, Kent, his family were seized with scarlet fever, and the question in dispute was whether the illness was attributable to sewer-gas, which found its way into the house, or to the prevalence of fever in the district at the time. Expert evidence was given on both sides as to the condition of the drains.—The jury gave a verdict for the plaintiff for twelve guineas, and Mr. Justice Cave reserved the question of costs.

The Earl of Rosebery will unveil a memorial to the late Sir John Macdonald, Premier of Canada, in St. Paul's Cathedral on Wednesday next. The memorial, which consists of a white marble bust in heroic size, is the work of Mr. George Wade.

WATER SUPPLY AND SANITARY MATTERS.

SALE, MANCHESTER.—The Local Government Board has now approved of the scheme prepared by Mr. M'Beath, surveyor to the board, for the purification of the sewage of the township, and given its sanction for the borrowing of £19,500 for the purchase of the land and the execution of the works. The plans were submitted to the Local Government Board in 1890 in order to meet the requirements of the Rivers Pollution Act as pointed out in a circular issued by the Manchester Ship Canal Company. The system adopted for the purification of the sewage is one of precipitation and filtration. The site of the works is near the Bridgewater Canal, and will cover an area of 5½ acres; but the total area to be acquired for sewage and other purposes is 15½ acres. The work will be commenced without delay.

CHIPS.

The foundation-stones of a new habitation which is being built for the Shipley corps of the Salvation Army were laid on Saturday last. The site has frontages to Commercial-street and Rhodes's-place. The plans have been prepared at headquarters, and Messrs. Rhodes Brothers have taken the contracts at about £2,000. The large central hall of the new barracks is intended to accommodate about 800 persons.

The annual luncheon of the Royal Scottish Society of Water-Colour Painters took place on Friday in the Fine Art Institute, Glasgow, where the exhibition of the society is being held. Mr. Francis Powell, president of the society, occupied the chair, and about a hundred sat down.

The name of Mr. Henry Roberts, of Latchford, near Warrington, builders' merchant, has been added to the commission of the peace for Warrington.

New board schools in Victoria-road, Middlesbrough, have just been completed, and will be opened in a few days. Mr. Bottomley, of that town, was the architect.

A large new clock has just been erected on Ridgmont Church Tower, Bedfordshire, which will doubtless prove a great boon to the inhabitants. The hours are struck upon a large bell, and there are two very distinct dials, each 4ft. 6in. diameter, facing north and west. All the latest improvements have been incorporated in the clock, which has been made by John Smith and Sons, Midland Clock Works, Derby.

At Farncombe—one of the districts of the greatly enlarged borough of Godalming—was opened last week a church room for the encouragement of the "social activities" of the parish. As one of these is the teaching of cooking, a special room is provided with range, sink, &c., and this serves also by a little arrangement as a retiring or committee room attached to the larger one, which will accommodate about 150 people. The architect is Mr. Charles Forster Hayward, F.S.A., and the builders Messrs. Mitchell Bros., of Stratford. Altogether, it promises to be a great success, having been opened by the Bishop of Winchester with great éclat.

About a century ago the celebrated Dr. Crotch, Regius Professor at Cambridge, was invited to compose chimes for the new clock erected at that time for the Great St. Mary's Church, Cambridge, and he adapted the chimes from Handel's air, "I know that my Redeemer liveth," and which are now heard in every part of the kingdom. The old clock having got considerably worn, the council decided to ask a few well known firms to compete for a new clock made on modern principles, but to have the original chimes inserted and to strike them upon the original bells. Messrs. Potts and Sons, of Leeds, were intrusted with the order, and have this week completed the work. The old clock has been removed and fixed in the museum.

Messrs. Burt and Potts have just made, fixed, and glazed a very large number of their casements for the Queen Regent of Spain, for her new summer palace at San Sebastian, and are now making the casements for the lodges at the same place. They have also just completed some very large folding casements for the Prince of Wales, for Sandringham Hall; and these they have also fixed and glazed, as also those for the Adelphi Bank, Liverpool. They have also completed within the last few months, or have still in hand, casements for the following:—The Prudential Assurance Company, Leeds, under Messrs. A. Waterhouse and Son, and for a very large house at Maidstone under the same architects; the Grocers' Hall, Princes-street, E.C.; the extension of the School Board offices, Thames Embankment; Messrs. Kelly and Co.'s new offices, 182-4, High Holborn; houses for his Grace the late Duke of Sutherland, at Windsor; Friar Park, Henley (a very large order); the Bury, King's Walden (also a very large order); new premises, 1 to 4, Duke-street, W.; new buildings, Carlos-place and Mount-street, W., &c.

Our Office Table.

THE forty-fifth anniversary dinner in aid of the funds of the Builders' Benevolent Institution, was held on the 3rd inst., at Carpenters' Hall, London-wall. Mr. Joseph Randall, the president of the institution, occupied the chair. The chairman, in proposing the toast of the evening, "Success to the Builders' Benevolent Institution," reminded his hearers that the charity was founded in 1847. At present 54 pensioners were in receipt of relief—viz., 19 men and 35 women, whose average age was 74 years. To maintain so many pensioners, liberal donations were necessary, especially as the annual subscriptions had somewhat fallen off. Why the female pensioners were so numerous as compared with the men, was that the widows of pensioners had been admitted on the death of their husbands. The income last year from all sources was £2,056, and the expenditure £2,070. The institution had about 700 donors and subscribers, a number which could, and should, be largely increased. Many of the pensioners had once been in good and even affluent circumstances; but, from causes which they had been unable to control, had found themselves reduced, and with no other resources left them but the benefits arising from this institution. It would, therefore, be a great hardship to curtail the annuities of present pensioners for want of funds, or to postpone the election of the five approved candidates, who were in straitened circumstances, and eagerly looking forward to early election. Mr. Plucknett replied on behalf of the institution, and thanked the president for his anxiety to help the charity. In the course of the evening subscriptions and donations to the amount of £492 were announced, of which sum £400 appeared in the president's list.

The London School Board again considered, at their last meeting, the proposal brought forward by the Works Committee, to the effect that the preparation of the plans of the new school to be erected in Priory-street, Bromley, should be placed in the hands of an outside architect to be selected by competition, and that the committee should prepare and submit for the acceptance of the Board the conditions of the competition. Mr. Lyulph Stanley proposed an amendment, referring the matter back to the committee, instructing them to submit further particulars, and asking whether it was proposed to pay an outside architect the usual professional commission of 5 per cent. The amendment, after a long discussion, was agreed to.

At Messrs. Minton's works at Stoke-on-Trent, on Saturday, a presentation was made to M. J. F. Léon Arnoux, on the occasion of his retiring from the post of art director to the firm, which he has held for upwards of 40 years. At the invitation of his friends, M. Arnoux selected specimens of three kinds of ware, which are almost exclusively manufactured by Minton's—viz., Henri-Deux candlestick and ewer; a Pembroke ewer, inkstand, and plate, in pâte-sur-pâte; and a pair of plaques, Barbetine. The pâte-sur-pâte specimens are the work of M. Solon, and the plaques have been decorated by M. Boule-mier with an arrangement after Watteau. The monetary value of the ware is about £100. At the gathering on Saturday afternoon, Alderman G. Leasons, one of the directors of the firm, presided, and the specimens of ware, together with an illuminated album containing an address, from employés who have seen upwards of 50 years' service with the firm, were presented to Mr. Arnoux.

"The Cost of Electric Light Supply" was selected by Dr. John Hopkinson, F.R.S., as the subject for his inaugural address as president of the Junior Engineering Society. In the course of this paper, read at the Westminster Palace Hotel on Friday evening, Dr. Hopkinson put the conjectural case of a station capable of supplying 40,000 16-candle lamps at one time, with mains and spare machinery enough to insure that the supply shall not fail. This station must always be ready to supply the 40,000 lights at half an hour's notice, day or night; but the lights were hardly ever actually required. Next they must suppose that the 40,000 lights were steadily and continuously supplied day and night. These were the two extreme cases possible. In the former the load factor was nil; in the latter it was 100 per cent. If the charge was by meter at 8d. per unit in the former case the revenue

would be nil; in the latter it would be £730,000 a year. To provide the maximum of 40,000 lamps they would need to deliver 2,500 units per hour, and the capital outlay would amount to £145,000. The cost of merely being ready to supply 2,500 units per hour at any moment would be £28,010, and the cost of actually supplying that quantity per hour would be £59,250. A Board of Trade unit was equivalent to 125c.ft. of gas. To be ready to supply a customer with electricity at any moment would cost those giving the supply not much less than £11 per annum for every unit per hour, and afterwards to give the supply would not cost very much more than 1-3d. per unit.

At the last meeting of the South Hants and Isle of Wight District Council of the Worshipful Company of Plumbers, held the other day at the Municipal-buildings, Southampton, it was resolved, on the motion of Dr. Mumby (medical officer of health), seconded by Mr. Blizard (master plumber), that the sum of two guineas be offered in prizes to the students attending the plumbing classes at the Hartley Institution. The subject of forming a local committee at Portsmouth, to act in co-operation with the council, was discussed, members from that town reporting the steps already taken in the matter. The council ultimately decided to adjourn the further consideration of the matter until the next meeting. It was resolved to hold an examination of candidates for registration at Bournemouth on the 19th inst., and the opinion was expressed that there would be a good attendance thereat.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Surveyors' Institution. Opening Address by the President, C. J. Shoppee. 8 p.m.

TUESDAY.—The Society of Architects. Opening Address by the President, Robert Walker, of Cork. 3 p.m. Annual Dinner at Holborn Restaurant. 7.30 p.m.

Institution of Civil Engineers. Papers on Graving Docks at Halifax, N.S.; Cockatoo Island, N.S.W.; Belfast and Newport, Mon. by the Hon. R. C. Parsons, E. W. Young, W. Radfern Kelly, and Robert Pickwell. 8 p.m.

WEDNESDAY.—Society of Arts. Opening Address of the 139th Session, by Sir R. E. Webster, Q.C., M.P., Chairman of the Council. 8 p.m.

FRIDAY.—Architectural Association. "Some Mysteries of Modern Architecture," by Paul Waterhouse, M.A. 7.30 p.m.

The Architectural Association.—November 18. The Second Ordinary General Meeting at 7.30 p.m. Paper by Paul Waterhouse, Esq., on "Some Mysteries of Modern Architecture."

ERNEST S. GALE } Hon. Secs.
F. T. W. GOLDSMITH }

Sir Frederic Leighton on Saturday evening opened the Royal Academy Students' Club at 9, Conduit-street. Afterwards he was present at a smoking concert given by the students with the aid of several well-known professionals. Mr. Alma-Tadema, R.A., presided, and was supported by Mr. Waterhouse, E.A., Mr. David Murray, A.R.A., and Mr. Seymour Lucas, A.R.A.

A new watering-place is being developed at Bouldon-on-Sea, Isle of Wight. An important stage in the enterprise was marked on Wednesday week by the driving of the first pile of the intended jetty and landing-stage. The landing-stage will be completed as quickly as possible to enable building material to be landed for the erection of numerous villas. Groynes are also to be carried out seawards, and a substantial concrete seawall is to be erected along part of the sea front of the estate, which will form an esplanade. Preparations for the commencement of these works have already been made. The arrangements are in the hands of Mr. John Fowle, architect and surveyor, of South Kensington.

The Bishop of Lichfield consecrated, on Tuesday week, the new chancel, morning chapel, organ-chamber, vestry, and sacristy which have been added to All Saints' Church, Steelhouse-lane, Wolverhampton. The work has been carried out in harmony with the style of the main portion of the edifice. The structural work was executed by Messrs. H. Willcock and Co. and the ornamental ironwork was supplied by Messrs. Hart, Peard, and Co., Birmingham, while the east window has been filled with stained glass by Messrs. Hardman, Birmingham. The interior of the church has been re-furnished, and some embroidered altar frontals, crimson velvet hangings for the sanctuary, crosses, vases, and other articles, were contributed as special gifts. The total cost of the work is £2,000. The architect was Mr. F. J. Beck, Wolverhampton.

Trade News.

WAGES MOVEMENTS.

THE CARDIFF STRIKE.—At the instance of the Bristol and other master builders' associations in the West of England and South Wales, a meeting of the council of the National Association of Master Builders was held in Birmingham last week for the purpose of considering the state of the strike at Cardiff in all the branches of the building trade, with the exception of the carpenters and joiners, who have been settled with. The following resolution was passed:—"That this association desires to place on record its appreciation of the firm stand the Cardiff Master Builders' Association are making in the protracted strike in the building trades in their town, and pledges itself to assist them by every legitimate means."

KINGSTON-ON-THAMES.—In view of the organisation of various branches of operatives employed in the building trades in the district, the master builders have formed an association which will cover a radius of five miles from Kingston Market-place. Already most of the local firms have joined the association, and one of the first acts of the association will be to prepare a schedule of prices which all the firms included in the association will pledge themselves to adhere to. At the present time there is no recognised standard rate of wage for the district.

WOOLWICH.—Forty-one joiners in the employ of Messrs. Kirk and Randall, struck work on Monday morning, and their example was followed at noon by the carpenters employed on the local jobs at the Arsenal and elsewhere, owing to the firm refusing to accede to the new rules which came into force on that morning throughout the extended "London district." The secretary of the London United Trades Committee, accompanied by Mr. C. Matkin, endeavoured to arrange an amicable settlement, but were refused an interview. The men held a meeting in the evening, and a resolution was carried unanimously claiming the full rate of 9½d. per hour, and calling upon the federated trades to assist them, and, if necessary, to block the firm throughout the district.

CHIPS.

Mr. G. F. Burr, M.S.A., architect, late of 27, Havelock-road, Hastings, having retired from practice, requests that no further trade or other circulars be sent to his old offices, as he has no use for them. We understand that Mr. Burr will still retain his membership of the Society of Architects although retiring into private life, and intends to devote his time to the management of his own estates in Worcestershire which he has lately succeeded to.

A memorial stained glass, by Mr. C. E. Kempe, of London, was unveiled at Alrewas parish church last week. It is of four lights, filled in with full-length figures of S. Augustine, the angel Gabriel, the Blessed Virgin, and St. Chad.

A water-colour drawing of Marple Locks, by Mr. S. H. Hopwood, has been purchased for the permanent gallery at Whitworth Park. Mr. Hopwood's picture is now in the autumn exhibition of the Manchester City Art Gallery.

An archaeological convention has been formed for the East Riding, with headquarters at Hull. The Rev. Dr. J. Charles Cox, F.S.A., has been elected first president and Mr. T. Tindall Wildridge honorary secretary.

New printing and publishing premises have just been built at Bury, Lancs., for the *Bury Times* from designs by Messrs. Maxwell and Tuke, of Corporation-street, Manchester. The building occupies the corner of Cross and Clerke streets, and has an octagonal turret over the entrance at the junction of the streets. The walling is of Ruabon bricks with moulded dressings. The printing shop is 72ft. by 42ft., with a wing 25ft. by 20ft. The compositors' room, on the first floor, is 55ft. by 52ft. The contractor is Mr. John Tinline, of Bury.

At the South Kensington Museum the erection is now being completed of an exact copy of a late Twelfth Century mosaic, "Christ entering Jerusalem," in the Cappella Palatina of Palermo. This is executed, not on paper, but in glass mosaic, similar to that out of which the original is put together.

At a meeting of the directors of Inverness Academy, held on Friday, it was agreed that Mr. Alexander Ross, architect, be instructed to prepare plans and specifications for a new academy, at a cost not exceeding £7,000.

The reading and magazine rooms of the free library at Clapham will be opened on Sundays from 3 to 9 p.m. from the beginning of December till the end of May.

Dear Sir,

I beg to inform you that Mr. Phipps and I have dissolved partnership, and that I have purchased from him all his share and interest in the business of Rashleigh Phipps and Dawson, and that Mr. Rashleigh Phipps has retired from the business, as from the 14th ult.

The business will be carried on as heretofore, at 53, Berners-street, by me, under the style of Roger Dawson. I shall also carry on the works for the manufacture of Electrical Fittings at Stanhope-street, Euston-road, as well as the branch establishment at Bournemouth.

I have arranged to retain the services of the same competent staff of artists and representatives, who have been hitherto employed by the late firm.

May I ask that when you require anything in Electrical Wiring or Fittings, you will give me the opportunity of quoting prices or submitting drawings?

I desire to mention that I am in no way connected with the business which is advertised as being now carried on under the name of Rashleigh Phipps and Co., at 102, Oxford-street, and that all accounts due and from the old firm will be respectively received and discharged by me.—I have the honour to be your obedient servant,

ROGER DAWSON,
53, Berners-street, W., London.
November 5, 1892.

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TENDERS.

. Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

BOURNEMOUTH.—For house, stables, lodge, &c., at Canford Cliffs, Bournemouth, for Colonel C. Mercier. Mr. Reginald G. Pinder, F.R.I.B.A., Arcade Chambers, Bournemouth, architect:—

Hoare, W.	£5,131	1	8
George and Harding	4,625	0	0
Hammerton and White	4,465	10	2
Hayward, Penton, and Hayward	4,152	3	7
Buckingham, E., and Son, Winchester	3,992	17	0
Rest of Bournemouth.			

BOURNEMOUTH.—For schools, Gladstone-road, Boscombe, Bournemouth, for the Bournemouth and District School Extension Committee. Mr. R. G. Pinder, F.R.I.B.A., Arcade-chambers, Bournemouth, architect:—

Hayward, Penton, and Hayward...	£2,130	0	0
Kitcher Bros.	2,031	0	0
George and Harding	1,997	0	0
Jenkins and Son	1,794	0	0
Hoare, W. (accepted)	1,535	0	0
All of Bournemouth.			

BOURNEMOUTH.—For schools, Malmesbury Park, Bournemouth, for the Bournemouth and District School Extension Committee. R. G. Pinder, F.R.I.B.A., Arcade-chambers, Bournemouth, architect:—

Kitcher Bros.	£2,325	0	0
Hayward, Penton, and Hayward	2,335	0	0
Abley and Cowley, Salisbury	2,224	0	0
Hoare, W.	1,948	10	0
George and Harding (accepted)	1,911	0	0
Rest of Bournemouth.			

BATTERSEA.—For providing a coal lift at the Mantua-road School, for the London School Board:—

Smith and Stevens (accepted)	£54	0	0
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BOW, E.—For extra cloakroom accommodation at Fairfield-road School, for the London School Board:—

Gregar and Son	£194	0	0
Neil, W.	183	0	0
Atherton and Latta	157	0	0
Gibb and Co.	157	0	0
Robey, J. T. (accepted)	152	0	0

BRISTOL.—For the construction of a gasometer of 5½ million cubic feet at Barton Hill, for the Bristol Gas Company:—

Aird and Sons, Lambeth (accepted).

BRISTOL.—For providing and fitting up machinery at the workhouse laundry at Stapleton, for the Bristol Board of Guardians:—

Bradford, T., and Co.	£516	0	0
Baker, W., Bristol	499	18	0
Strong, H. O., Bristol (accepted)	450	0	0

BUSHY.—For the carrying out of sewage outfall and disposal works for the Watford Union Rural Sanitary Authority. Mr. Urban A. Smith, C.E., Victoria-street, S.W., engineer:—

Dickson, J., St. Alban's	£7,722	4	0
Jackson, J., Plaistow	7,537	0	0
Neave, J., Forest Hill	7,533	0	0
Turner, T., Ltd., Watford	6,801	16	4
Cooke, B., and Co., Battersea	6,447	6	8
Wingrove, J. T., Northampton	5,749	0	0
Dupont, F., Colchester (accepted)*	5,738	6	3

* Corrected total.

CARDIFF.—For relaying the sewer in Corporation-road, for the town council:—

Ridley, T. D.	£1,706	0	0
Pearson, T. C.	1,627	10	0
Ailan, J.	1,464	11	0
Gregory	1,294	12	10
Strachan	1,240	0	0
Rees, T.	1,029	5	0
Ashley, F. (accepted)	906	0	0

DURHAM.—For the erection of two shops and eight-roomed house, &c., at Stanley, Co. Durham, for Mr. W. Aynsley. Messrs. John Smith and Son, Shotley Fridge, Co. Durham, architects. Excavator, bricklayer, and mason and carpenter, and joiners' quantities only by Mr. George Bell, 63, Collingwood-street, Newcastle-on-Tyne, building and quantity surveyor:—

Excavator, Bricklayer, and Mason:—			
Brown, H., and Co., Newcastle	£1,016	4	11
Routledge, A., Armfield Plain	790	0	0
Johnson, W., Flint Hill (accepted)	736	0	0
Carpenter and Joiner:—			
Brown, H., and Co., Newcastle	8'5	14	3
Haslop, J. T., Dipton	630	0	0
Mordue, T., Dipton (accepted)	619	10	0

GODALMING.—For the erection of works of main drainage, for the town council:—

Botterill, W. J., Cannon-street	£20,115	0	0
Neave, J., Forest Hill	15,451	0	0
Kavenagh, S., Surbiton	14,853	11	0
Facey, R. R., Taunton	14,056	10	0
Cooke, B., Battersea	13,900	0	0
Cunliffe, W., Kingston-on-Thames	13,747	11	0
Peters, F., Horsham	12,100	0	0
Morgan, Isled, and Morgan, Southampton	10,496	0	0

GODALMING.—For alterations to the town hall, for the corporation:—

Humphries (accepted).

LANDPORT.—For additions to the Bedford Hotel, for Messrs. Pike, Spicer, and Co.:—

Jones, H., Portsmouth	£2,160	0	0
Light, W. R., and C., Landport	2,045	0	0
Scammell and Dowdell, Landport	1,930	0	0
Corke, J. H., Southsea (accepted)	1,790	0	0

LONDON.—For rebuilding and extending the Bedford Institute, Spitalfields, for the Bedford Institute Committee (Society of Friends). Mr. Rutland Saunders, F.S.I., 6, Bishopsgate, Without, E.C., architect. Quantities by Mr. Walter C. Phillips:—

Ashby Bros.	£7,780	0	0
Hall, Biddall	7,500	0	0
Woodward and Co.	7,399	0	0
Prestige and Co.	7,890	0	0
Colls and Son	7,278	0	0
Lawrance and Sons	7,134	0	0
Mattock Bros.	7,133	0	0
Jerrard, S. J. (accepted)	7,069	0	0

LONDON.—For ventilating appliances at the Daniel Lambert Hotel, Ludgate-hill, E.C., for Mr. R. H. Barnes. Messrs. Dickinson and Paterson, 5, John-street, Adelphi, architects:—

Blackman Ventilating Co., Fore-street, City (accepted).

LONDON.—For St. Bride's Foundation Institute, Bridgelande, E.C. Mr. Robert C. Murray, 1, Raquet-court, E.C., architect:—

Dove Bros.	£20,875	0	0
Holliday and Greenwood	19,949	0	0
Holland and Hannen	19,839	0	0
Colls and Sons	19,833	0	0
Smith and Co.	18,946	0	0
Mills, J.	18,790	0	0
Nightingale, B. E.	18,587	0	0
Grover, J., and Sons	18,498	0	0
Brass, W., and Sons	17,973	0	0

LONDON, STAFFS.—For the erection of a boundary wall in Trentham-road, for the town council:—

Bailey, P. (accepted)	£299	14	0
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MARGATE.—For the erection of three cottages for Yockley's Charity. Edward Saunders and Son, F.S.I., 6, Bishopsgate-street Without, E.C., architects. Quantities by Mr. W. C. Phillips:—

Brown, J., and Son	£909	0	0
Paramor and Sons (accepted)	835	0	0

MILLWALL, E.—For providing at the British-street School, Millwall, a lean-to covering in the boys' playground, for the London School Board:—

Gregar and Son	£294	0	0
Atherton and Latta	181	0	0
Robey, J. T.	175	0	0
Gibb and Co.	147	0	0
Neil, W. (accepted)	74	0	0

MONTGOMERY.—For the construction of conduit works and the supply of standpipes, for the waterworks committee of the town council:—

Griffiths, Oswestry (accepted).

(In lieu of tender from T. H. George, withdrawn since acceptance.)

PLYMOUTH.—For erection of convalescent home at Tamerton Foliot, near Plymouth, for Dr. C. A. Kingston. Messrs. King and Lister, Plymouth, architects. Quantities supplied:—

Shellbear, G.	£4,540	0	0
Jinlin, W. T.	4,500	0	0
Falk and Partridge	4,281	0	0
Finch, J.	4,055	0	0
Lephorne and Goad	3,944	10	0
Berry, J. F.	3,774	18	6
Lethbridge, A. R., and Son	3,697	10	0
Millman, S., Tamerton (accepted)	3,454	10	0
Rest of Plymouth.			

SALE, CHESHIRE.—For the alterations and additions of St. Anne's Church Schools. Mr. John Lowe, Manchester, architect:—

Smith, J., Sale (accepted)	£1,450	0	0
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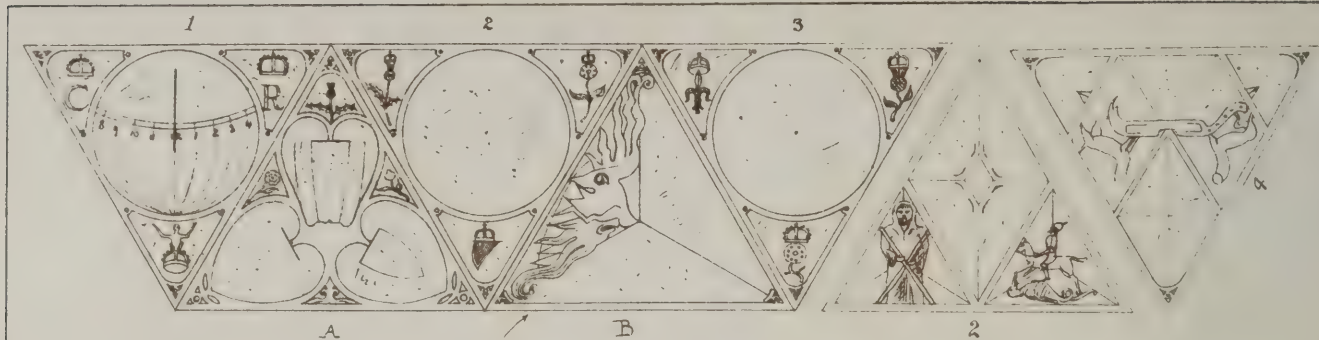
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Accrington	Burdett Road	Earl's Court	Kensal Green	Moorgate Street	Soho	Whitechapel	Police Barracks	Belfast Methodist	Salisbury
Acton Green	Burscough	Edgware Road	Kentish Town	Monument	South Bromley	Whitefield	Eastney	ist College	way Place
Aldersgate street	Junction	Farringdon	Kilbury	Newcastle-under-Lyme	South Kensington	Whitley	Fleetwood	Battersea, St. Sutton	
Aldgate	Bury	Street	King's Cross	New Cross	ton	Widnes	Fulwood	Mary's Church St. Jude's	
Althorp Park	Borough Road	Farrington	King William	Newport	ton	Willenhall	Halifax	Birmingham, Tayport	
Altrincham	Mersey Tunnel	Street	Langley Green	Newton Heath	Southport	Willesden	Hamilton, Glasgow	Cowper Street Torrington	
Aston	Canonbury	Fenchurch	Latimer Road	North Brentford	Speke	Wood Green	Hulme	Clapham	Upton Cross
Ash Street,	Camden Road	Street	Lea Bridge	North Bridge	Spring Grove	Wormwood	Knightsbridge	Colchester	Wandsworth
Stockport	Chalk Farm	Firby	Leamington	Northampton	Stechford	Scrubs	Leicester, Glen	Forest Gate	
Birmingham,	Charing Cross	Forest Gate	Leman Street	(Castle Station)	Stoke	Stourbridge	Parva	Hanway Place	Hospitals.
New Street	Cheddington	Level Crossing	Leyland	Nottingham	Stourbridge	Stratford	Manchester	Harrow	Belfast County
Banbury	Cheetham Hill	Fulham	Leyton	Oldbury	Stratford	Sudbury	Newbridge	Harrook Hill	Lunatic Asylum
Barnsby	Junction	Geedley	Leytonstone	Old Ford	Sudbury	Sunderland	Newcastle-on-Tyne	Orphan Workhouse	Greenwich Infirmary
Barnesley	Chequerbent	Gloucester Road	Lichfield	Oldham (Mumps)	Sutton	Sutton Coldfield	Normanton	Jamaica Level	
Batley	Clifton	Gower Street	Limehouse	Paddington	Ashton-under-Lyne	Temple	Northampton	Leyton, Gram-Guy's Hospital	
Bedminster	Clietheros	Grantham	Lincoln	Parsons Green	Lyne	Thornton	Norwich	mar School	Lincolnshire
Bescot Junction	Crooked Billet	Hackney	Little Ealing	Patricroft	Barnet	Torquay	Portsmouth	Leyton, Church County Asylum	
Birmingham	Level Crossing	Haggerston	Liverpool Road	Pickel Bridge	Belfast	Tower of London	Preston	Newhaven	County Lunatic
Blackfriars	Cross Lane	Hammersmith	Liverpool Street	Plaistow	Budbrook	Tring	Regent's Park	North Bow	Asylum
Blackfriars Bridge	Crumpsall	Heaton Park	Llandudno	Pleek	Burnley	Tynemouth	Salford	Old Ford	Notley Hospital
Blake Street, Sutton	Culleroates	Hereford, Barr's Court	Long Buckby	Plymouth	Caterham	Upton Park	Shorncliffe	Poplar, Byron & Peterborough	
Coldfield	Cannon Street	Highbury	Loudoun Road	Poplar	Chatham	Victoria	Trim	Bright Streets	Infirmary
Blaydon-on-Tyne	Daubhill	Walsend	Ludgate Hill	Portsmouth	Chester	Walham Green	Warley	Southsea, Rubery Asylum,	
Blithley	Daybrook	Hollinwood	Mark Lane	Radcliffe	Coventry	Walsall	Winchester	Church Path	Northfield
Bolton	Denholme	Holyhead	Mancheston	Roads	Curragh Camp	Walsall	Woolwich	Southsea, Omega St. Thomas's	
Bolts Bridge	Derby	Homerton	Manchester, Exchange	Salisbury Road	Dublin, Beggar's Bush	Waterloo	Wrexham	Street	Hospital
Bombay, India	Drylesden	Honley	Manchester	Seething Lane	Dublin, Island	Liverpool			
Bow	Drighlington	Hounslow	Manchester	Shadwell	Weaste	Weaste			
Bowdon Central	Dudley	Hounslow Bar-racks	Mancheston	Sheffield	Werneth, Old-Dublin, Ship	Werneth, Old-Dublin, Ship			
Brick Lane	Dudley Port	racks	Mancheston	Shoreditch	Westbourne	Westbourne			
Bristol	Dundee	Keighley	Mancheston	Sloane Square	Dublin Royal	Dublin Royal			
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Queen Mary's Sun Dial.
Holyrood Palace Grounds

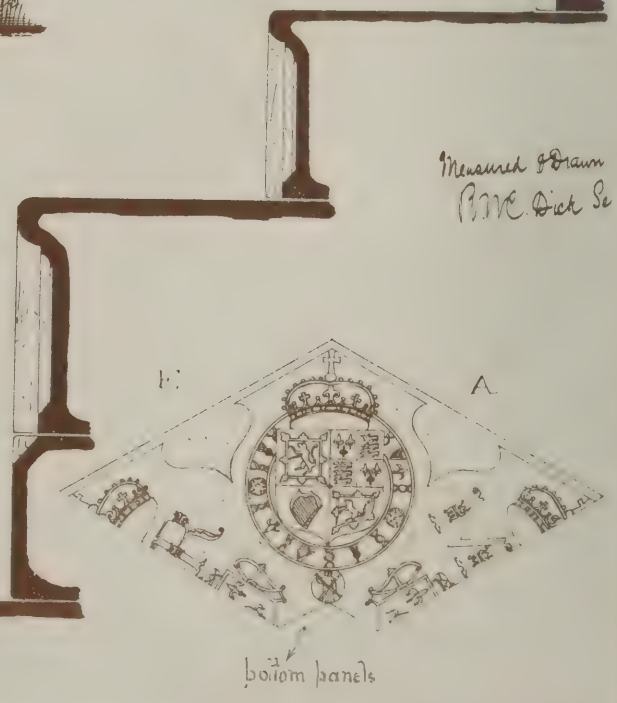
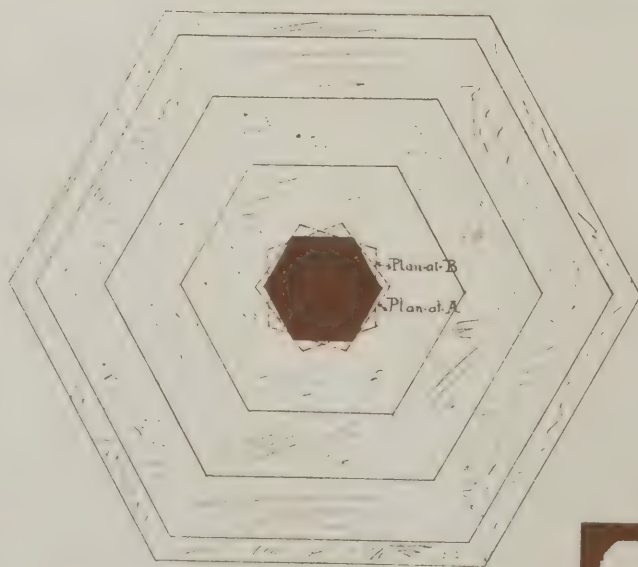
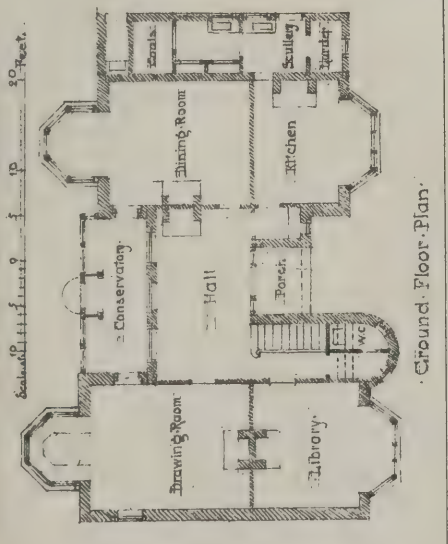




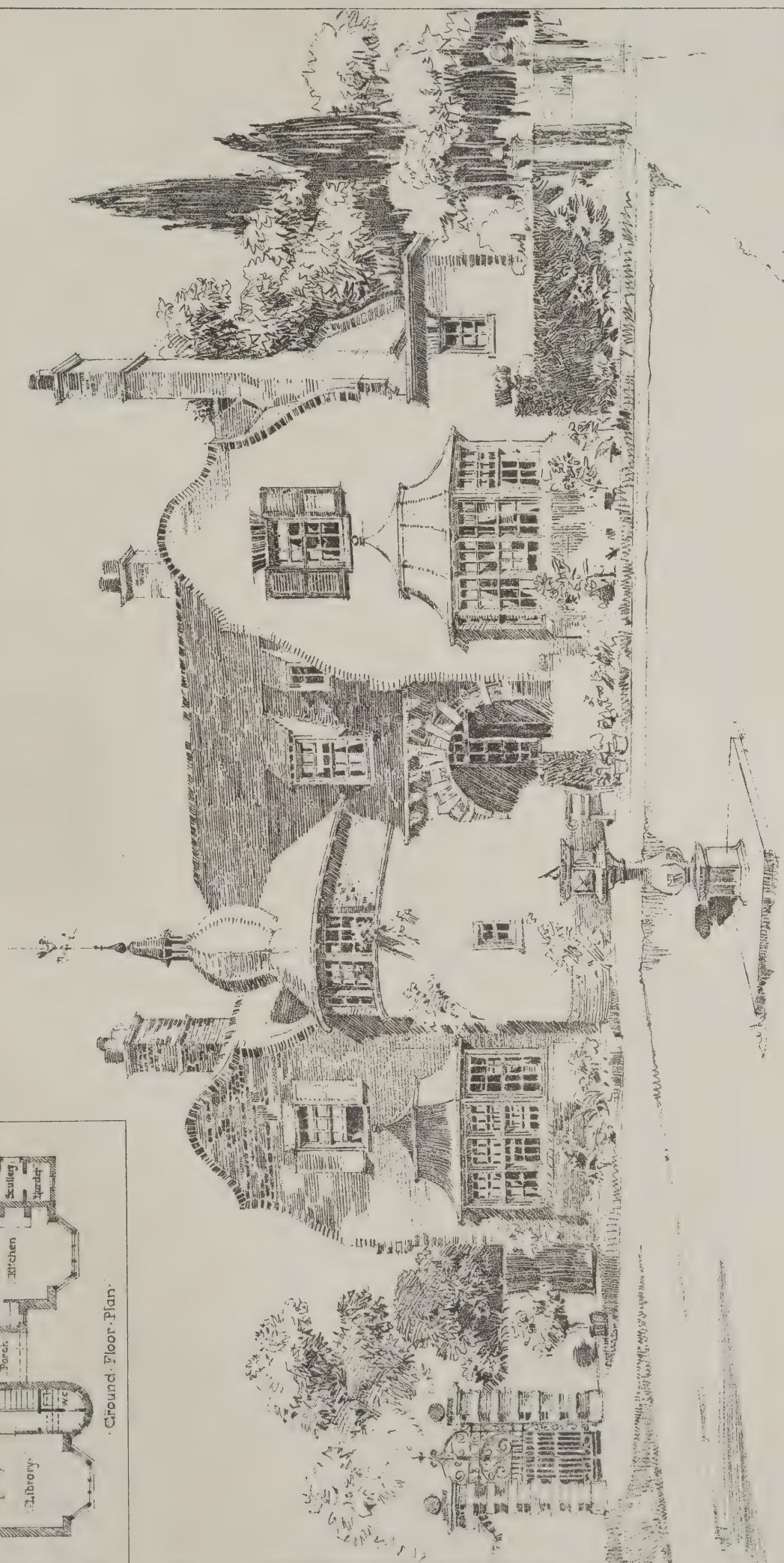
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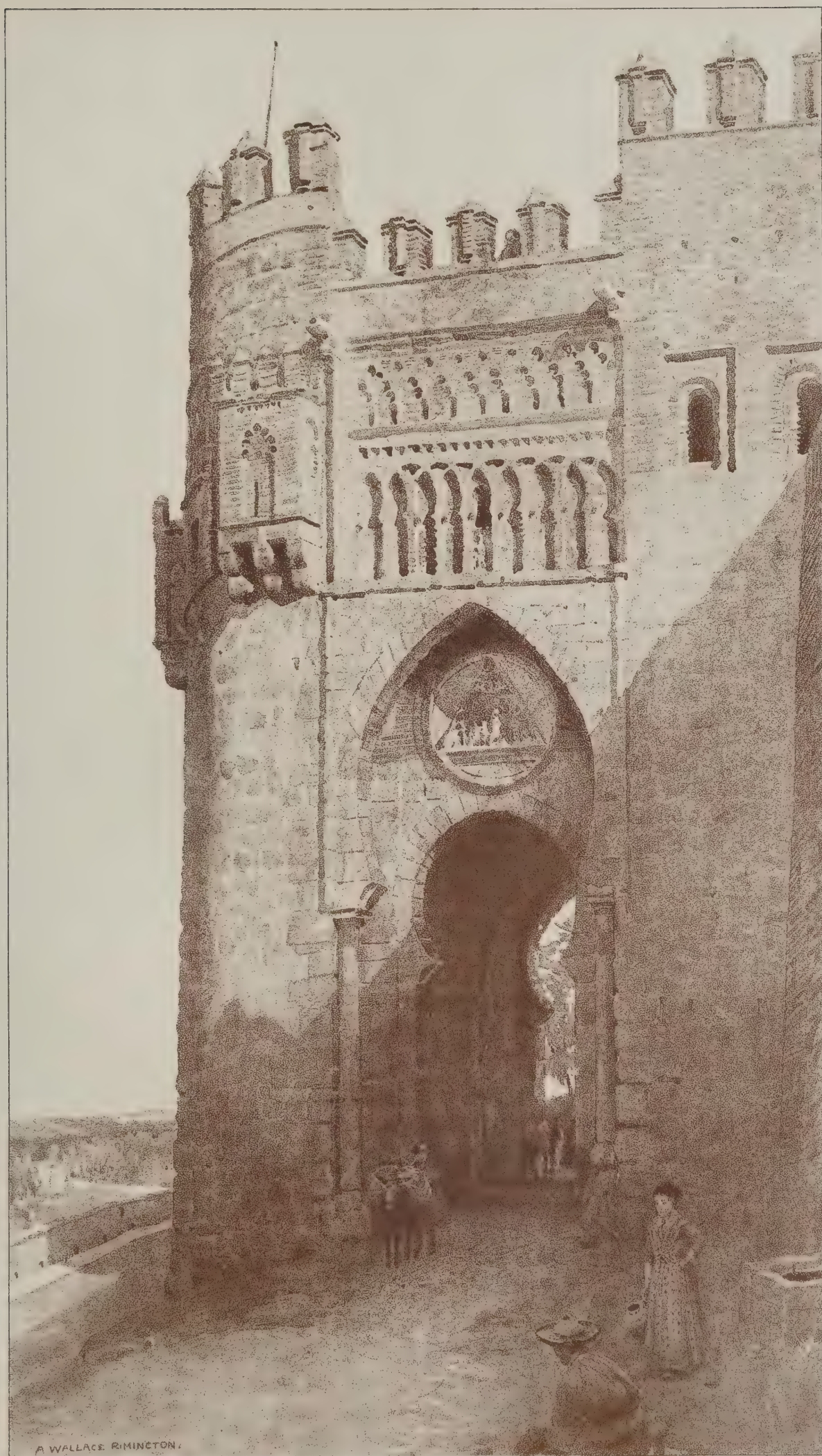


Ground Floor Plan.



R. A. BRIGGS ARCHT.

Photo-Tint by James Akeman, 6, Queen Square, London, W.

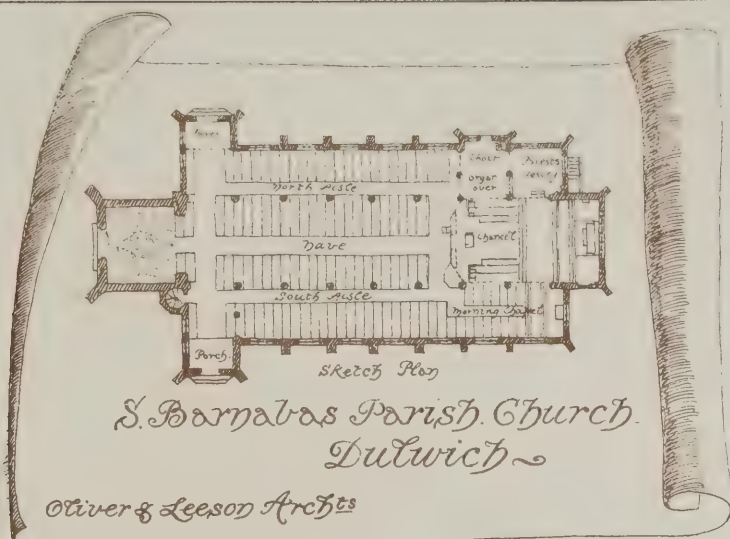


A WALLACE RIMINGTON.

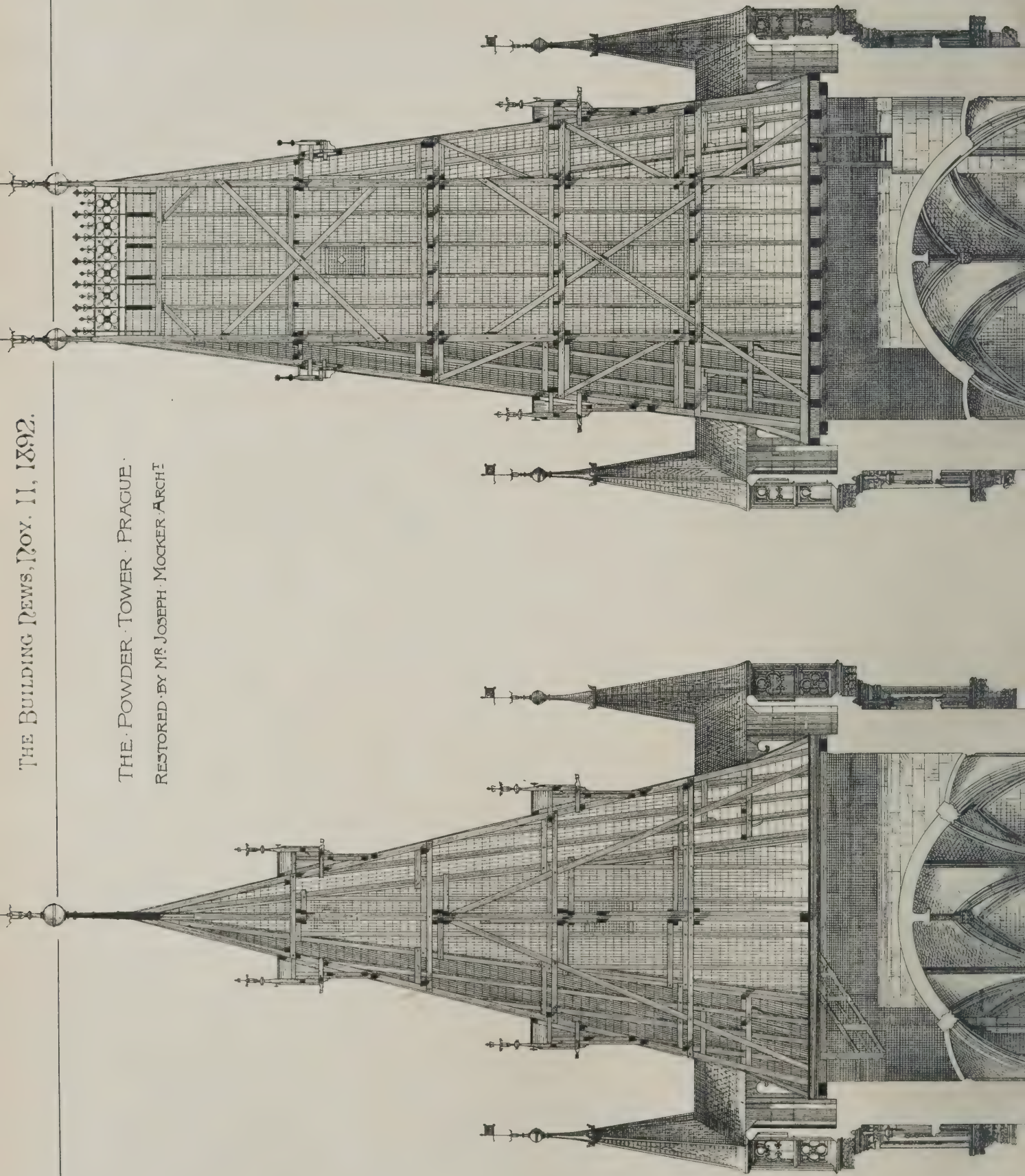
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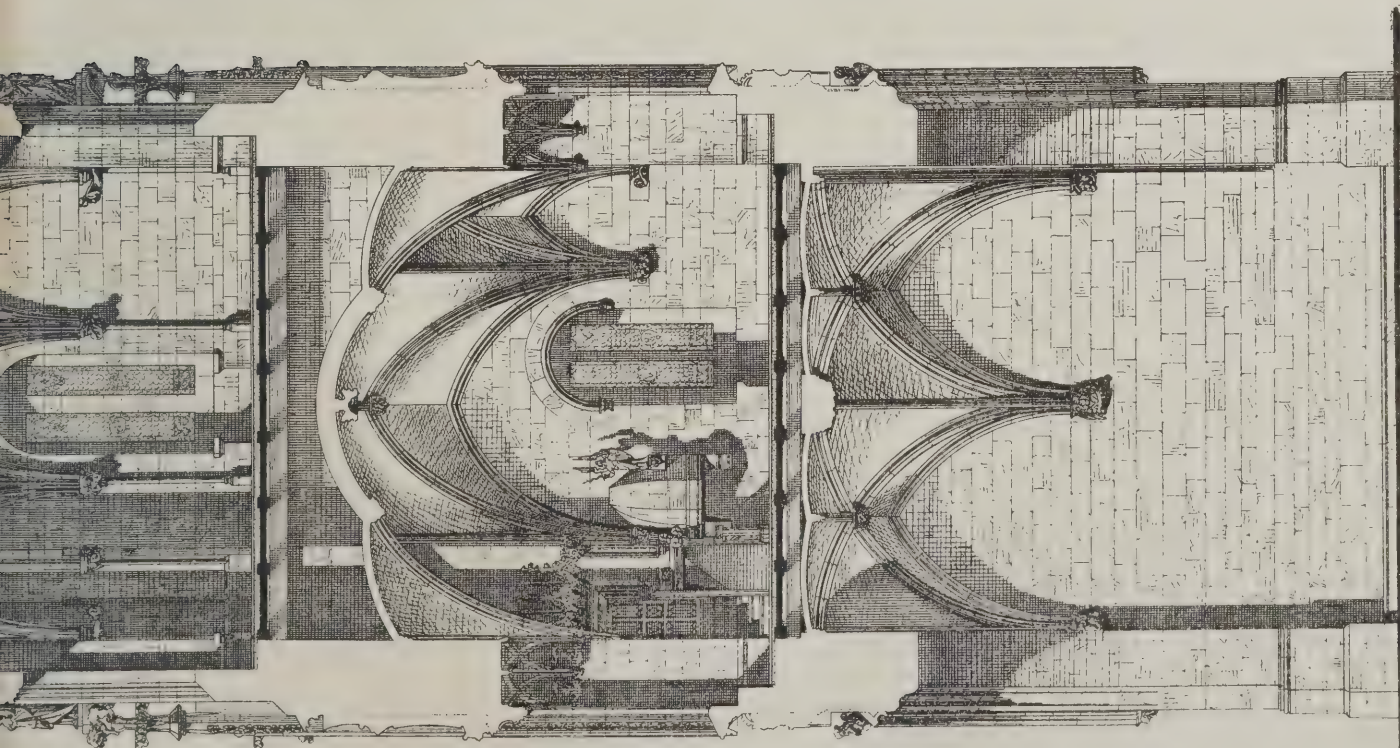
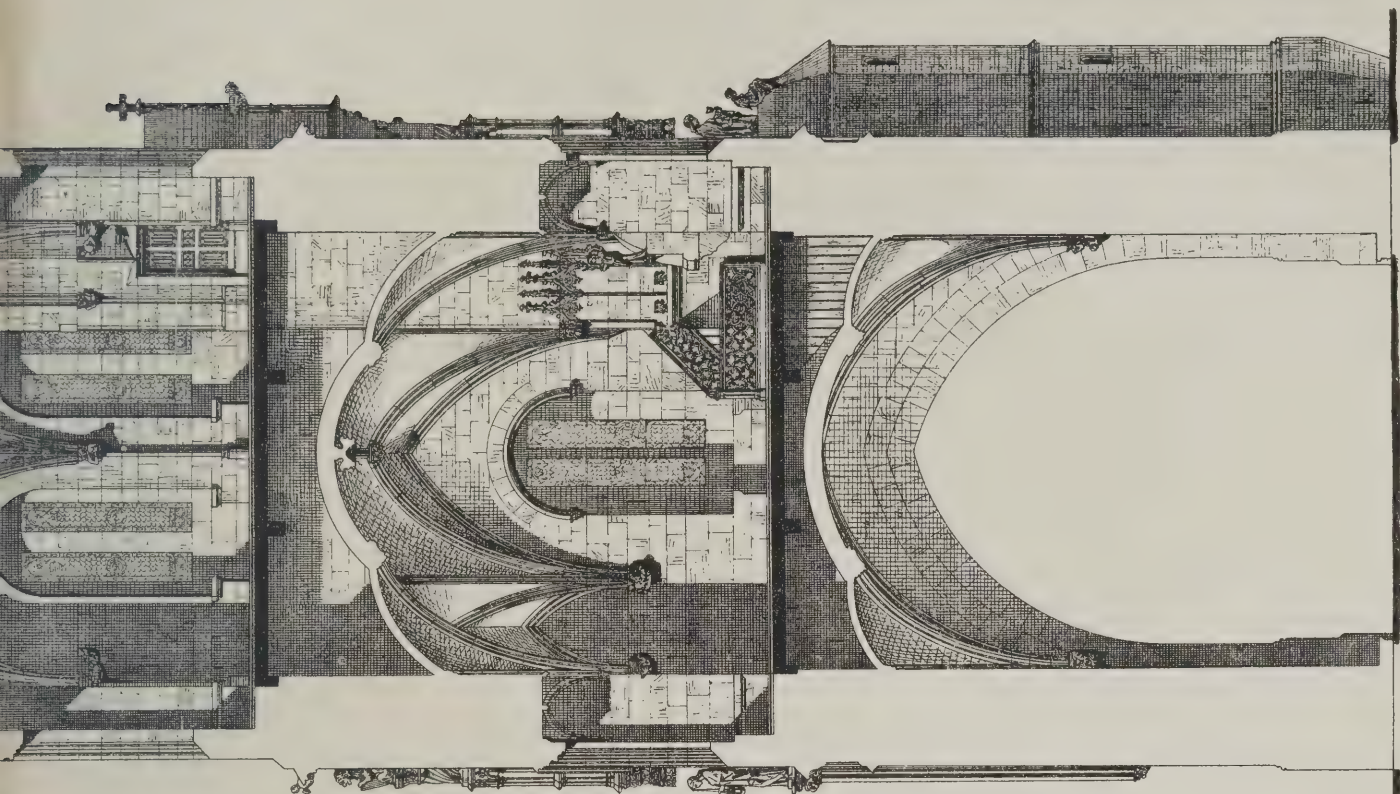
PUERTA-DEL-SOL · TOLEDO · FROM A WATER COLOUR DRAWING · BY · A WALLACE RIMINGTON





THE POWDER TOWER, PRAGUE.
RESTORED BY MR. JOSEPH MÖCKER ARCHT.





THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1976.

FRIDAY, NOVEMBER 18, 1892.

"THE COUNCIL BROADWAY."

FOR a long time past we have heard much of the "Council Broadway," but during the last two weeks we have heard even more than a great many expected. With the various schemes that have been submitted for the Strand to Holborn improvement will always be closely associated the "betterment" principles of the London County Council, the last phase of which was so prominently brought before the public in the report of the Parliamentary and Improvements Committees, which was discussed at such length by our municipal government a fortnight ago. The taxation of ground landlords throughout the County of London is but the extension of the "betterment" area to its utmost limits.

It is already a matter of history that the proposals of the Committees were, that if, instead of acquiring any property within the "limits of deviation," the Council should leave the same in the hands of the owner, then the owner of such property should contribute 50 per cent. of the enhanced value or special benefits conferred upon it. This 50 per cent., it appears, is proposed to be "secured by way of charge," and the value to be ascertained by an arbitrator, with power for the owner to "redeem such charge." In the preamble to the report it was stated that the Council had been advised that the enhanced values or special benefits conferred on property by new streets would in no case amount to any sum approaching one-half the net cost of the street. The next recommendation appears to us most fair, provided "betterment," irrespective of "area," is adopted, as it ought to be, as the right and proper means of raising the necessary funds for street improvements in the future—namely, the taking "into account in assessing compensation" of all improvements that have been made since the 22nd July last, "when the scheme was made public." It is well known to many of our readers that where land or property is thought to be "scheduled" by a public body, to be acquired for public use, there has been a strong temptation for the owner to "improve" the property, and thus enhance the value obtainable as compensation. We have nothing to do now with the arguments for or against betterment, but we do think that the public pocket should not be drained upon to compensate for what has been only created for the purpose of compensation. It is some satisfaction, however, that this class of speculator is sometimes caught in the toils of his own net, for we have heard of buildings still standing in this Metropolis which were erected in order that they might be bought by public money to be pulled down.

The third recommendation of the Committees, which was adopted with an addition in the form of an amendment, suggests the new and wider area of "betterment," to which we have already referred. In this it is advocated that a moiety of the cost of the improvement should be paid out of "any new rate to be imposed by Parliament on the Metropolis as a *Land Values Improvement Rate*, to be charged as in the nature of a land-tax in respect of the ground values of property within the County of London"; such rate, it was mentioned in the report, should be charged upon the owner, and not be capable of being made "the subject of contract, so as to shift the incidence thereof." With a view to the introduction by the

Government of a Bill dealing with the subject in the ensuing session, the Committees recommended that a communication should be made to the Local Government Board. These recommendations, with instructions to the Parliamentary Committee to embody in a separate Bill provisions for creating an "improvement rate or charge on owners of property," to create a moiety for the cost of the "Council Broadway," were adopted by the London County Council after a lengthy discussion at their meeting on the 8th inst.

The legal advisers of the Council seem to have pointed out that "the charge" cannot be imposed upon owners of ground values of property within the County of London by private Bill, but must rest on a public Bill, and that the Bill to be promoted by the Council relating to the "Council Broadway" should contain a provision that if any such *Land Values Improvement Rate* were created by Parliament next session, a sum not exceeding an annuity—to be calculated, and to be equal, on the £3 per cent. tables payable half-yearly for a term of 60 years, to a sum of £1,123,000—might be charged upon and raised out of such *Land Values Improvement Rate*, in respect of the cost of this scheme. Such rate, it is estimated, would have to be at least one penny and a fifth in the pound on the estimated ground values of the Metropolis.

It is not for us to deal here with the probabilities of the suggestions being acceptable to the present Government; it is well known that "betterment" was not looked upon with a favourable eye by the last Parliament, and no one can surmise the fate of the present, and enlarged, scheme. Nor do we pretend to anticipate what will be the exact course taken by the Council—whether they will adopt the introduction of a Government measure, as recommended by the Committees, a private Bill, as embodied in the amendment, or both. Let it suffice to point out the absolute necessity for the speedy construction of a new street from the Strand to Holborn. How it is to be paid for is a public, more than an architectural, problem; but how the street, when formed, is to be developed, is a matter that concerns the architect, and so important did the President of the Royal Institute of British Architects consider the subject, that he devoted a considerable portion of his address at the opening of the present session to the consideration of the subject.

It will be remembered that the proposed "Council Broadway" is to be a street 100ft. in width, running from St. Mary-le-Strand northward to High Holborn at a point exactly opposite Southampton-row. At the Strand end the road diverges east and west, Holywell-street disappears in the widening of the Strand, Blackmore-street and White Hart-street are widened, and at a point where Sardinia-street now stands it is proposed to form a circus. Four large buildings are partly or wholly destroyed, the Electric Lighting Works in Sardinia-street, the Board school in Vere-street, and the Olympic and Globe Theatres.

Commenting upon the proposal, Mr. MacVicar Anderson drew attention to the "happy thought which ought to conduce to the convenience of the public" in the divergence of the traffic from the north to the east and west at the southern extremity of the proposed street, instead of discharging it at a single point in the busy thoroughfare of the Strand. "The expediency, however," he said, "of laying out the street on the central axis of a line drawn northward from the centre of St. Mary-le-Strand appears to be open to doubt. The Church of St. Mary was designed, as we know, to be viewed from the west and east, notably the former, where it forms so charming a feature in the street architecture of London; and from an artistic point of view it is questionable whether it is wise to make it the central feature of a northern thoroughfare, to which it would

present a frontage not designed for such a purpose, with the tower and steeple to one side instead of being in the centre of the vista from the north." There is much in the suggestion that Somerset House should form the central feature, that will meet the approval of all architects.

The improvement of the thoroughfares of this Metropolis, with a view of relieving the congested and ever-increasing traffic, is a subject of vast importance to architects and citizens alike, and the President did well to remind the Institute and individual architects of the responsibility upon their shoulders in endeavouring to "educate public taste by adorning a public thoroughfare," responsibility not to clients only, but to the public also, "for," said he, "such buildings cannot by any possibility remain inoperative, they must exercise some influence for good or for evil on the minds of men, and in proportion as they inspire by truth and purity, and create correspondingly elevating emotions, are they entitled to rank as works of architecture. Apply this test to one of the most important modern thoroughfares in London."

The problem of rehousing the artisans displaced by the demolition of property to form new streets is a grave one, which has no doubt received fully the consideration of the Council, and we are informed that with the exception of 470 whose work and occupations necessitate their being rehoused on the spot, and of 800 whom it is necessary to rehouse within a mile of their present residence, it is contemplated to remove 1,800 of the working class population to the suburbs, a provision which helps to relieve overcrowded London, and permits of a healthier mode of living.

The estimated cost of this scheme is—for the removal of Holywell-street and construction of the new street, £1,870,000; the widening of Blackmore street and White Hart-street, £130,500; the widening of Wych-street, £25,500, making a total of £2,026,000. With such large sums of public money at stake, it is for architects as a body to see that uniformity and harmony are exercised in the carrying out of the architectural treatment of a thoroughfare that should be one of the finest in the world. It would not be correct to say that such opportunities had never occurred before, when we remember what might have been done with Northumberland and Shaftesbury Avenues. Mr. MacVicar Anderson reminded his hearers that so noble a thoroughfare as that contemplated by the Council would afford a worthy field for the display of architectural skill; and, referring to the power required by the Council to control the architectural elevation of the new street, he said that, should this mean that the control is to be real—and not visionary, as in the case of Northumberland avenue—and that it is to be exercised by persons competent to deal with the subject, we may regard the proposal with satisfaction. It is most sincerely to be hoped that the Council will leave the responsibility of the approval of the designs in the most competent hands—indeed, it appears to us that such an important question as the approval of designs for such a thoroughfare through the heart of this vast city should be left to a small representative committee of the greatest architects of the age, and that such a committee—say, of three (the smaller the better)—should be drawn from the ranks of the Royal Academicians and the Royal Institute of British Architects.

In designing the buildings for the World's Fair of Chicago, the American architects employed have endeavoured, without sinking their individuality, to attain a harmonious whole, under the directing hand of one leading architect. This principle appears to us to be one that, in a measure, should be adopted in such a national undertaking as the "Council Broadway." All architects

obtaining commissions to erect buildings upon sites bordering upon the new street, should submit their designs to the criticism and direction of the representative committee we have suggested; then, after consultation with them, and following the probably good advice they would receive, we could reasonably expect to have streets with buildings, while devoid of monotony, harmonising its entire length, instead of a conglomeration of structures, as in Shaftesbury-avenue, which, the President of the Institute suggested, created no emotions in a cultured mind other than those of irritation and disgust. "Buildings they are, certainly—architecture they are not."

May we look to the Council themselves to lead the way in the true artistic improvement of our streets? It is hoped we may, for it is no secret that in years to come a Council of the future may choose to erect in Council Broadway an hôtel de ville worthy of so powerful a body. It is well known that the present offices of the Council are quite inadequate for the staff required to carry on the many duties of this body. There cannot be many more years of delay before London has a town hall. When almost every provincial town throughout the kingdom can boast of such a building, it is strange that London has to do without; but this is not the only anomaly that the Metropolis suffers from. When it does come, let us hope that the county hall and offices may form a building of no mean architectural merit, and be the keynote for the harmony of the Council Broadway.

DIVISION OF BUILDINGS.

THE important statutory provision that a building devoted to commercial purposes should not have an unrestricted space of more than a certain cubical capacity is not very clearly understood, if we are to judge from the frequent instances in which the law has been broken or tested. Every now and again we hear of summonses being taken out against builders of premises who have exceeded the limit of 216,000c.ft. in respect of buildings of the warehouse class, the contention raised in reply being that the building came within the class of dwelling-houses. The question has usually turned on the meaning to be attached to subsection 4 of the 27th section of the Metropolitan Building Act, where it is laid down that "every warehouse or other building used either wholly or in part for the purpose of trade or manufacture, containing more than 216,000c.ft., shall be divided by party-walls in such manner that the contents of each division thereof shall not exceed the above-mentioned number of cubic feet." Now, it is obvious that the question rests upon the meaning of the words "or other building used either wholly or in part for the purpose of trade," &c., a phrase which is wide and elastic enough to include a vast number of buildings that are not certainly warehouses, but are used partly for trade and partly for dwelling purposes. A lawyer would have no scruple in including in this category every kind of business or shop premises where the building contained only one floor as a shop, and all the other floors as dwelling rooms, and we cannot be surprised that Mr. Vaughan, the other day, decided that certain extension of business premises, additions to Messrs. Shoolbred's Tottenham Court-road establishment, came under the above section of the Act. The circumstances of that case we have already reported (page 654). Here was an important building in Grafton-street of eight stories, 87ft. in height, the total cubical contents of which were 272,800ft., exclusive of the staircase, which added 16,656ft. An iron and concrete floor at the fourth floor level divided the building, it would appear, horizontally, the contents of the rooms above the

floor being 62,087ft.; but this floor of iron and concrete was pierced by four openings for lifts besides the staircase. The basement is to be used for packing goods, the ground floor as a shop; but the upper floors are intended to be occupied as dining-rooms, scullery, and kitchen offices. The chief question in this case is whether a horizontal division by a fireproof floor constitutes a proper "party-wall" or an equivalent to one between the lower and upper portions. If we deduct 62,087, the cubical contents of the upper rooms, from the total 272,800ft., it leaves 210,713c.ft., which is within the statutory limit, and it has been assumed that, therefore, the building conforms to the requirements. We have here an important point brought again to the notice of the profession, whether a building divided by a fireproof floor is equal to one divided by a vertical or party-wall. We hear that it was decided some years ago in the affirmative in connection with a previous building carried out by this firm.

A large number of buildings in towns, especially in London, are what we may call "composite"—that is, erected for the purpose of more than one occupation or business. In the City we have large structures built primarily for offices, let in flats, but having retail shops and stores on the ground-floor and basement, and above offices, bedroom accommodation, kitchens, and lavatories. Broadstreet, Lothbury, Cornhill, Cannon-street, Chancery-lane, Victoria-street, Westminster, are filled with buildings of this composite kind, as they are found to be more remunerative owing to the heavy ground-rents. We cannot place these buildings in the category of warehouses; they are mainly residential, but the basements and ground-floor stories often contain a large quantity of combustible goods. Is it carrying out the intention of the Act to construct a fireproof floor of iron and concrete between the shops and the premises above, with the intention that each division should not exceed the 216,000c.ft.?—or should more frequent party-walls be built through the whole block vertically? This is one of the questions raised. If the law only takes cognisance of two distinct kinds of buildings—*warehouses and dwelling-houses*—and leaves the composite building, such as we have described, out altogether, then we can understand why so many buildings of the latter class are not interfered with, and why buildings may be half warehouses and the other and upper half dwellings. But this obviously is not the intention, for the same section provides that separate sets of chambers tenanted by different persons shall be divided so far as they adjoin vertically by party-walls, and so far as they adjoin horizontally by fireproof floors, when such sets exceed 3,600sq.ft. The horizontal division, then, is not unrecognised in these cases, nor does it appear that it is in the case of the composite class of buildings named, for the horizontal fireproof floor was, if we mistake not, decided to be equal to a party-wall in a case brought before the magistrates some years ago. Subsection 4 of section 27 is, as we have said, elastic enough to include the composite class of buildings; but then it may be argued that the section only applies to buildings intended for warehouses, as nothing is said about dwelling-rooms—that is to say, it applies to a warehouse that may be only partially used for the purposes of trade or manufacture. The clause at least is not so clear as it might be, as it should distinctly define how much of the warehouse accommodation or floors for goods or storage should be permitted in a given building to make it a warehouse under the Act. The term "wholly or in part" is ambiguous, for it implies that if only one floor or room of a building is used for trade or manufacture, and the other floors be dwelling rooms or offices, the section is to take effect, and there-

fore that every block of offices or residential chambers is amenable to the limitation if any portion, however small, is used for trade. At any rate there is a great difficulty in ascertaining where a building of a composite kind exceeding the statutory cubical capacity is really exempted from the operation of the Act, and it is upon this ground that an amendment is called for. The clauses in the Consolidation Bill proposed except certain buildings, and the L.C.C. in its General Powers Act may, if satisfied on the superintending architect's report, and that of the chief officer of the fire brigade, that larger dimensions are necessary for the purpose of trade or manufacture, not involving the use of inflammable materials, and that arrangements for lessening danger from fire are made—may consent to larger dimensions, but in no case is the building to have a greater cubic capacity than 450,000ft., or be above 60ft. in height. We do not complain, however, of the limit already in force for warehouses, but for other buildings of a composite character the clause as it now stands is vexatious. The party-wall division is unquestionably a safer mode of preventing the spread of fire than the horizontal fireproof floor, although there are circumstances which render the latter kind of division essential in all buildings occupied partly by trade and partly for habitation. Large hotels with shops on the ground floor and large blocks of flats let out for shops on the same floor are instances which require the horizontal division of space, of course without any openings for lifts.

One question having a decided consequence in all future buildings of this kind has been raised in this case, and the profession will wait with interest the result of the appeal that has been granted to Messrs. Shoolbred. What is a warehouse? is the question that has to be settled once for all. It may seem strange that after so many years of building in London since the year this clause was framed (the 18 and 19 of Victoria) builders and architects should be so continually making mistakes, and it is also strange that buildings are allowed to be commenced, and far advanced, before irregularities are discovered. In this instance the application was made for a building of the dwelling-house class; plans were submitted with walls of the required schedule thickness, and it seems curious at least that the mistake was not pointed out at this early stage, before the building was commenced.

"WHAT HAVE WE TO DO WITH THE BEAUTY OF LONDON?"

THE London School Board had a discussion last week on the design for the extension of their offices on the Embankment. Their architect considers that, to complete the proposed long frontage in a satisfactory way, a tower is absolutely necessary; and he proposes to make it useful as well as beautiful. The Works Committee of the Board had approved it, and the great majority of speakers were in favour of it; but, on a division, the matter was referred back to the Committee for further consideration. The alleged reason for objecting to the tower was its cost, which is estimated at the moderate sum of £3,000, out of the total expense of £220,000. The mover of the amendment to reject it alleged that at ratepayers' meetings this clock-tower would be "flung in their faces," and a supporter of it said "they were asked to spend this money so as not to impair the beauty of London. What had they to do with the beauty of London?"

We agree with the last speaker that it is a monstrous thing for him, or anyone like him, to "have to do with the beauty of London." It is a blot on our civilisation that anything noble or admirable should lie at the mercy

of the pennywise and the pettifogging. Unfit to decide on questions of art, they are equally unfit to be trusted with matters of education. It is they—always eager for the halfpence that can be picked out of the gutter, and always incapable of seeing the sovereigns that might be gained in cleaner places—who have done so much to make national education a curse instead of a blessing. It is they and their class, with its inborn want of imagination, who impose, or seek to impose, one dead uniform type of training on millions of children, each with his own special aptitudes and tastes and capabilities—the training that qualifies a boy to become a junior clerk. They have turned out half a world-full of junior clerks, till every advertisement for one is answered by hundreds, almost thousands. They have brought junior clerks and senior clerks almost to the verge of starvation, and the pressing problem with wiser men is how to undo their handiwork? Here, at the same moment, we see everything like workmanship declining or threatening to decline for want of able workers. Germany is beating us in technical thoroughness, France, and even Japan, in artistic thoroughness, and America in invention and power of adaptation. England must match and over-match them, unless she is to sink into a second Holland. It is time, indeed, to set up technical schools, and to make art schools into a more real power than they have ever been yet, or before long even the pettifogger will feel the pinch—in the only sensitive part of him—his pocket. In the mean time let him at least keep out of the way. The times do not need him, any more than they need the miserable legion of unemployed clerks which his obtuseness has produced. They need the workman, and the art workman, and both workmanship and art workmanship have ranged themselves in all past ages, where they are likely to range themselves in all future ones—round the art of building. "What have we—the London School Board—to do with the beauty of London?" It is the utterance of a man talking in his sleep—a Rip Van Winkle who will be roused by-and-by. "You have everything to do with it," is the answer of those who are awake. "You have to preserve it where it comes in your way, you have to train up children who can appreciate it and add to it. You have trained enough starvation clerks; open your eyes and see what you may learn to better purpose."

So much for the type of mind, or of mindlessness, which cannot realise that those who are to succeed in the arts ought to grow up amidst artistic surroundings. It does cut, to every child alike, a little reading, a little writing, and a little arithmetic, and thinks that these things—and these alone—are the "rudiments of education." It starts with a sort of vague belief that nobody, in the good time coming, will need skilled hands or strong sinews. It tacitly assumes that when people everywhere know something about words and something about figures, Nature will kindly give them all they want, without any need for manual exertion. The working man is to cease. His descendants will be superior to the necessity for labour. The human race will write or lecture, or sit at desks on four-legged stools, keeping accounts, and in this way they will get a genteel living. No one will be degraded by having to lay bricks, or to work stone, or to shape timber. Education will do away with the mechanical trades. There will be a millennium of black coats and chimneypot hats, and we shall all belong to the lower middle classes. That is the vision of delight which dances unsteadily before the dreamers who "have nothing to do with the beauty of London." It is a vision that can never be realised. Now, as of old, it is hard labour to make bricks, hard labour to carry them, hard labour to lay them; and yet houses will not spring up by

themselves, though the whole population had the training of a senior wrangler. Now and always, as far as human foresight can discern, the majority of men will need physical strength and mechanical skill. The three R's will not save them: in the sweat of their brow they must earn their bread.

It is the great merit of the artist that he sees this fact, and is prepared to deal with it. It was never his ideal to take all men out of flannel jackets and put them all into shoddy coats. His notion of elevating the masses is not to turn the top of the working class into the bottom of the trading class—to make the carpenter into a small shopkeeper, and the mason into a jerry builder. He sees—what the anti-artist cannot see—that there is a limit to this kind of thing. If he is a Radical, he is such a Radical as Felix Holt, who did not think that the chief end of man was to have three steps to his door, and a brass knocker above them. He is sure that a workman may be just as good, just as cultured, and just as refined as anyone else, and that he may become so through the work he has to do. He would raise him now as he was raised in former times, by making him, in his own sphere, an artist. He would show him how to do his work in such style that all educated people shall admire and be in sympathy with it. He has made up his mind that the amount of respect due to a man ought to depend on *what* he is, and not on *where* he is, and, being quite sure about this, it does not trouble him that a large part of the human race will always have to be where—or not very far from where—the best of the working class is at present. Thus the artist's is a practical ideal, while the anti-artist's is not. It is so, even from the commercial point of view. The anti-artist's notion of elevating a child is to put him out of his own rank into what the popular prejudice of his day counts as the rank above it. For a little while, this may succeed. One mechanic's child, or a hundred such, may rise—if it is a rise—to be clerks or tradesmen, and may find themselves earning more money so than their fathers did before them. But this process cannot go on for ever. When many, or most, mechanics' children come to attempt it, the profits fall, and the end is that they gain less money and have heavier expenses than if they had remained in the rank from which they set out. The world is not calling for more clerks or more tradesmen. But it is calling for better work, for more inventive work, and for more artistic work. For these things it offers better pay, as well as more personal consideration. In producing them lies the hope of the English working class. To train its children so that they may be fit to produce them is a most urgent duty of English School Boards, and they cannot be trained to any purpose amongst starved, sordid, scamped surroundings. The art workman, if he is ever to come near his full stature, must grow up from childhood amongst beautiful things. His schools should be beautiful within, his cities beautiful without. It is only in such surroundings that admirable work, on any large scale, has ever been done. And now, when by the labour of generations, and the expenditure of millions, something has been accomplished towards making our greatest city beautiful once more, there are actually managers of public education who cannot so much as let it be. They are told that they will destroy the beauty of that riverside terrace which has been shaped into some picturesqueness, and which has many possibilities of more, and they grunt out in reply, "What have we to do with the beauty of London?"

We come to an aspect of the case which even Mr. Pennywise may open his eyes to. He has, or professes to have, a terrible dread of the ratepayers. They are a long-suffering race; but once in a while they do stand up and kick when the burdens laid on them are

more than they can bear. Waste and folly are the things that crush them down; and for waste and folly the round world does not hold the match of Mr. Pennywise. Take the case of the very building under discussion, the School Board offices on the Thames Embankment. Thousands of pounds have already been spent to make it architectural. Consistent penny-wisdom would have kept it, from first to last, as plain as a pikestaff, and would have saved all this money. But penny-wisdom never is consistent. So it begins by aiming at an architectural work. It takes a great deal of trouble, and goes to a great deal of expense—an expense borne by the ratepayers—to produce such a work. Having produced it, the necessity arises for enlarging it; and then penny-wisdom thinks that the idea of keeping it architectural had better be given up. It has spent thousands of pounds out of the rates to make the offices an artistic success; and then it proposes, as an economy, to do what will effectually destroy such success as has been attained. It coolly recommends that all these thousands should be wasted and go for nothing; and then it turns to the ratepayers and says, "See what a friend you have in me! See what a saving I am going to effect!"

Penny-wisdom, such as this, runs more or less through all the public management of England, from the village vestry to the Treasury Bench. More than half the candidates for every office, high or low, seek support by promising to save sixpence in ways which will waste a shilling. Take one way, familiar enough to all contractors for public works. The Government decides, some year, on building a large structure,—say a barrack or a hospital,—to cost a £100,000 or so. It would look extravagant to ask for all this money at once, and get the thing done. So, to make a show of economy, only a small vote on account is taken, perhaps for £10,000, and the works are begun. Next year another Government is in power, having carried the elections by glowing promises of retrenchment; or the old Government remains, but is seized with a saving fit. No more money is voted that year or next. The frost gets into the unfinished brickwork; the water saps the undrained foundations; the walls get pushed over by children and idlers; the hoardings and scaffolds decay, and are destroyed. When at last Parliament votes more money, the work which was paid for previously has become almost worthless, and the contractor makes heavy claims for loss of plant, and perhaps for loss of time. In one way or another, the first £10,000 is gone,—with nothing to show for it: and this is what penny-wisdom counts as economy. Look at another case of the same sort, which occurred in the last generation, but whose consequences may well be seen. The Houses of Parliament were just being begun. The Government of the day had appointed a distinguished commission of men eminent in geological knowledge and practical building to inquire into and report on all the principal building stones of the kingdom, so that the very best kind might be adopted for the great national work. After immense trouble and expense they issued their report—a very thorough and valuable one, and they recommended the Bolsover or Church Anston stone which has actually been used. How is it, then, that for more than thirty years past the masonry at the Houses of Parliament has been perpetually decaying? We owe it to the Pennywise of the period. The quality of Bolsover stone, like that of most others, varies in different parts of the quarry. The best is admirable, and the worst is execrable. A clerk of works had been appointed, at a very moderate salary, to live at the quarry, and to make sure that only the best beds were sent up to London. But when the £150, or thereabouts, which was to be paid him yearly,

appeared in the Parliamentary estimates, some patriotic soul protested against it as a waste of public money. The Government were weak enough to yield; the clerk of works was dismissed, and for his age-long monument, that patriotic economist has the mouldering plinths and cornices of the Palace of Westminster.

Such things may be done in Parliament. Our system of party government is an encouragement and a protection to them, and electors have to sit and see them done without being able to interfere. But it is not so on the London School Board, which has not, as yet, become a servant too powerful for its masters. Those masters are the people of the metropolis. Public improvements are their property, and have been paid for with their money. And when any servant of theirs boasts that it is no business of his to avoid spoiling these improvements, he is plainly above his work and unfit for his place. To ask, "What have I to do with the beauty of London?" is to make it clear to everybody that London and he had better part.

THE SOCIETY OF ARCHITECTS.

THE ninth session of the Society of Architects was inaugurated on Tuesday afternoon by a meeting held at the Society's rooms, St. James's Hall, Piccadilly. The President, Mr. Robert Walker, of Cork, occupied the chair. Mr. ERNEST DAY, of Worcester, Vice-President, proposed the adoption of the report of the Council, of which an abstract was published in our issue of the 28th ult., p. 588. He congratulated the members on the lucid and encouraging character of the report, and remarked that there was a deficit of 15 guineas in a total income of £1,100; but it included several items of expenditure, such as those of incorporation, that could not recur, and there is a substantial balance of assets over liabilities. Mr. E. TIDMAN, treasurer, seconded the motion, which was carried unanimously. A vote of thanks to the donors to the library was proposed by the ex-president, Mr. W. H. SETH-SMITH, who remarked that every year saw an improvement in the library, which was now well housed and arranged. He appealed for donations of additions to the volumes from members and their friends. This was seconded by Mr. J. W. FRAZER, of Newcastle-on-Tyne, vice-president, and was agreed to.

The following gentlemen were elected:—As an honorary member, Rev. John Edward Field, M.A., Benson Vicarage, Wallingford; as members, Edward Coath Adams, 11, Great James-street, W.C.; Philip Condry, 9, Newcomen-street, S.E.; John Wordsworth Darwent, Ramstorth, Ecclesfield, Sheffield; Leonard James Kempster, 341, Strand, W.C.; and Frank Lovell Lee, 14, Gray's Inn-square, W.C.

The President then delivered his

OPENING ADDRESS.

Having acknowledged the honour conferred upon him by election to the chair for the third time, Mr. Walker paid a handsome tribute to the valuable services rendered by his immediate predecessor, Mr. Seth-Smith, and continued:—In accepting the trust, I bring to the discharge of the duties involved a renewed confidence in the willingness of the Council and Officers to labour for, and in the loyalty of the members in promoting, such measures as we believe to be for the best interests of our profession, in relation to architectural art and practice, and in relation to the public whose interests we profess to conserve; and this you have endeavoured to do, through evil and through good report, since the inception of the "forward movement" which called you into existence as a society, and which movement you have supported and which you will continue to support, earnestly and persistently, but inoffensively, until the progressive bark is conducted safely into smooth waters: under the strong conviction that the measures which you seek to promulgate will develop true architectural art. And I wish to add emphatically that the supporters of the "Architects' Education and Registration Bill" who number into the tens of hundreds inside and outside of this Society, only hope to participate in the advancement of architectural art and practice which its passing will

most certainly inaugurate, in common with those who, for the moment, regard it with apprehension or hostility, and whose numbers are, so far as our information enables us to form an opinion, a constantly diminishing minority. If there be any who indulge in the selfish hope of special and undue advantage arising from the passage of this Bill through Parliament (and rumour, from probably where the east wind rises, says there are such), it will prove to be a delusive and vain hope never to be realised; but the charge, if it ever were seriously made, may be dismissed as a weak device intended to injure the measure, and may be regarded as the creation of an unscientific imagination which never seeks for a foundation to build on. It is what lawyers call a constructive case, resting upon the same sort of basis as the castles in the air, which the boy in the Scotch song built on as he looked into the puffing low (fire), following the example of "many mighty men"; but in this case he is the prototype. Your council's report contains a review of the past session's work, and gives the statistics of your financial and numerical growth. Your printed proceedings give your secretary's (Mr. Middleton) clear narrative description of the Society's tour into Belgium last year. I regard these tours as times of learned leisure, where some with pencil and some with pencil and palette fix in their sketch-books excellences of plan, elevation, and grouping, beauties of form and colour, and effects of lights and shadows. On the last occasion that it was my privilege to address you from this chair, I suggested that the Architects' Education and Registration Bill Committee, which was appointed in 1886 by a conference of delegates from the three kingdoms, should collect what had been written on both sides of the question it had in charge, eliminating irrelevant matter, and reissue it in the hope that it may reach the apathetic and indifferent, and induce them to give the measure due consideration, and finally their support. This suggestion has not been acted on, and owing to the general desire that has been expressed for information as to the nature and present position of the measure, and the prospects which the outlook portends, it seems fitting that I should shortly refer to the objects of the Bill, and its method of dealing with acknowledged evil, as I fear many have never read it, and others, having read it, have forgotten its scope and the nature of its provisions. There is a saying in the North, whence many of our sturdiest plants in the arts, sciences, and literature have sprung, that "Ill weeds will up." A condition precedent to eradicating them is to clear the ground, amongst other measures, and this is ever a slow process, demanding care and patience. Speaking figuratively, the plantation of architecture is invaded by this evil, and the object of the measure before Parliament is to clear the ground so that the seeds of education may have freedom to grow and strengthen, yielding a fruitful harvest of good architectural art when the harvest-time is reached. Ages ago it was said that you cannot root up the tares without injury to the grain, and the husbandman must bear with the result of his neglect which fostered the growth of the two together until the harvest. The evil of incompetence amongst architectural practitioners has been sufficiently exposed in your printed proceedings, in the professional journals, which have done good service in this direction, and in the public press for the last 32 years, since the passing of the Medical Act, which deals with a singularly analogous state of things to that which architectural art and practice suffers from at the present time. The promoters of that Act endured 30 years of contumely, fierce personal abuse, and unreasonable and unreasoning opposition, vile aspersions and unblushing misrepresentation; even the truth, when, through the stress of circumstances, it had to be touched by their opponents, "was handled carelessly," to borrow a picturesque grouping of words from our American cousins. Through all this unsavoury trial, inflicted by selfish and narrow-minded foes from within the ranks of their own profession, the promoters waded prior to the passage of their Bill through Parliament in 1858. As it emerged from the portals of the Upper House, Lord Elcho said, "You have got it, gentlemen, after 30 years' struggle; I hope it will be of some use to you." It certainly bore the marks of the conflict in scars and mutilations, which the wisdom of Parliament has been engaged in amending periodically ever since, and in adding Amendment Acts due to the growth and development

of education, which ever moves forward, creating new necessities, and to the result of experience and increased knowledge. And such, I apprehend, will be the conditions that await the Architects' Education and Registration Bill when it takes its place in the Imperial Statute Book as an Act; there will be no limit to the free growth and "Advancement of Architectural Art and Practice," fostered by wise provisions for the discovery and development of aptitude, cultured attainments, guidance in education, general and artistic, technical and special, supplying to genius an equipment of training which will bear fruit, differing in degrees of excellence in proportion to the possession of natural gifts by aspirants. If the Bill passes its second reading in its present form, which may be said to be likely, as its principles are unassailable, the next stage is the Committee stage for the consideration of its details, which will then be very properly submitted to close scrutiny, and will be liable to modification and amendment; when opponents as well as supporters will be face to face with the public whose representatives constitute the House of Commons, which is the final authority to mould its clauses and give force to its provisions, taking care that they are in harmony with the public interests and on the lines of strict justice to all parties concerned. It has been pointed out by the promoters of the Bill—(1) That it is expedient that persons requiring professional aid in architecture should be enabled to distinguish qualified from unqualified practitioners; (2) that the necessity for higher qualifications in persons assuming the functions of an architect has been acknowledged by the profession and observed by the public for a great many years; (3) that persons without any training in art, science, or technical education whatever may and do practise as architects, and that a large number of persons are now so engaged is unquestioned; (4) that want of due qualification on the part of persons so employed is not only injurious to architectural art, but may result in injury to life and health, discomfort, pecuniary loss, lawsuits, embarrassments, and much loss and damage, without a remedy; (5) that public attention has been called to the evils of incompetency for the last 30 years, and efforts have been made from time to time to induce professional bodies to take up the question and deal with an ever-increasing evil, alike injurious to the interests of the public and the profession, and absolutely discreditable to the latter, but without avail; (6) that the number is largely increasing year by year of unqualified practitioners whose conspicuous want of technical knowledge and architectural art training is bringing the profession into contempt; (7) that this state of things has promoted the practices of proprietors carrying out works without the aid of an architect (which, of course, under the Bill they will have a perfect right still to do), there being no guarantee that the required knowledge would be possessed by the practitioner who may be consulted, in a profession, where the function may be assumed without any training in architectural art, or technical or other education of any kind whatever having been acquired prior to the assumption, and experience pointing to the probability that the necessary qualification would be absent; (8) that members of the profession, inside and outside professional bodies, seeing that the evil was becoming so increasingly manifest that the public themselves would be driven to call for a remedy, and considering that reform in any profession should proceed from within, and desiring to remove the odium which the absence of architectural art education entailed, resolved to take action in the matter. Accordingly, in 1886 a conference of architects was summoned by advertisements in the professional journals and 6,000 circular letters, to meet, on April 6, at the Freemasons' Tavern, London, which was largely attended by practitioners from all parts of the United Kingdom, at which resolutions were passed in favour of seeking Parliamentary powers to deal with the evils complained of and for educational purposes, and a committee was appointed to give effective force to the resolutions. Those members of the committee who agreed to act, proceeded to discharge the duties imposed upon them. Having considered the question, and prior to drafting a Bill, the committee, in August, 1886, to further test the feeling of the profession, sent out 2,500 circulars to the best-known members of the profession in the form of a declaration, *For or Against*, seeking legislative powers. 1,300 were returned signed and approved *For*, and only three wrote expressing

doubt or disapproval. A Bill was then drafted with due regard to Parliamentary precedent and form, which was submitted to Parliament, read a first time and withdrawn, owing to the fact that the Royal Institute of British Architects, Institute of Civil Engineers, and Surveyors' Institute, through their respective Councils, declined to be dealt with under the same Bill, and objected generally to the measures. To conciliate the strong opposition, which was unexpectedly hostile, the committee remodelled and recommitted the Bill in the form of the Architects' Education and Registration Bill, omitting from its purview civil engineers and surveyors, but introducing a compensation or exemption clause to meet the exigencies of such exclusion. To the late Lord Beaconsfield the saying has been attributed that "life is a system of compromise," or words to that effect; but it is to be observed that some men appear to be unembarrassed by the possession of any other faculty than that of the power to object. It is an absorbing faculty and consistent; it admits of no coquetting with any other faculty that may consciously or unconsciously impair its unyielding force; and so with a consistency that is marvellous in its indifference to appearances, the Amended Bill, amended to conciliate the vehement hostility to the inclusion of civil engineers and surveyors, was met with even more vehement hostility from the same quarters on the score of their exclusion. The Bill so modified is the Architects' Education and Registration Bill, now "hung up" in Parliament, waiting for the opening of the first session. I have sufficiently indicated its necessity and objects. If fuller information on the subject be desired it may be found in the printed Proceedings of the Society of Architects, in lectures in the professional journals, and in the Bill itself, all easily procurable. I wish to refer briefly to some of the main provisions of the Bill, and first let me say that some misconception has arisen from the short title given to the Bill, for which the promoters are in no way responsible. It was given to it when it was presented in the House by one of the clerks at the table. The short title in the body of the Bill is "Architects' Act," and is used only for the purpose of citing. The Bill provides for a council which shall be styled "The General Council of Architectural Education and Registration of the United Kingdom" (with branch councils) consisting of the following members:—Five persons nominated by Her Majesty with the advice of her Privy Council, three for England and Wales, and one each for Scotland and Ireland; five by the Royal Institute of British Architects, one by the Royal Academy of Arts, one by the Royal Institute of Architects, Ireland; two by the Society of Architects, two by the Architectural Association and its affiliated societies, five by provincial societies, nine by direct representatives, five for England, two for Scotland, and two for Ireland. The position of the professional bodies remain undisturbed, their powers are strengthened and confirmed, vested interests are recognised, and the public interests are safeguarded. Any or all of the clauses are open to amendment or modification. All persons who, prior to a date to be fixed in the Act, were actually in practice as architects, are, under certain reasonable limits of proof, admitted to register; and, after that date, all aspirants must comply with the educational requirements of the Act before being registered, for which a fee will be charged, the same as is provided in other similar Acts, to meet the expenses of administering the Act. It will also create a fund to be devoted to lectureships, examiners, art and technical education, the establishment of a museum and library—in fact, all that will go to build up a school of architecture and provide a teaching body to co-exist with an examining body. If this Bill be passed there is little doubt but that chairs of architecture in all colleges would be established; two now only exist. I have to say generally that this measure will regulate architectural education and practice; it will check the growth of incompetency by guiding the education of aspirants to the profession from as early a period as possible, helping them to discover special aptitude and genius, and, perhaps a still more valuable service, helping them to discover their absence. The vested interests of persons who may be said to be incompetent can only be dealt with as the Bill proposes, for Parliament would not tolerate any other method in dealing with incompetent persons in an

established practice. It was the opposition to a similar clause which retarded for so many years the passage of the Medical Act, which was ultimately passed, including this clause, by a majority of nearly 3 to 1. The Bill disturbs none of the recognised bodies, but it provides for the gradual extinction of incompetency by making it compulsory for all future architects to give evidence of having received special training and education—a stipulation which is so obviously reasonable and so calculated to produce the maximum of results, and is so universally acknowledged as wise and prudent, that there is no department of life-work to which the principle is not applied or ought to be applied. The Bill is now in the charge of Mr. L. Atherley-Jones, M.P., under whose able guidance all that is practicable will be done to advance it through its remaining stages; the best assistance that can be rendered to Mr. Atherley-Jones will be an exhaustive and free criticism of the clauses of the Bill, giving instances to prove its necessity or otherwise, with a view to approval, modification, amendment, or excision, communicated through Mr. Edgar Farman, 37, Walbrook, E.C., the hon. secretary of the Bill Committee. Having referred to the World's Congress of Architects to be held at the Chicago Exhibition in August, 1893, the President added: I have received from the Royal Victorian Institute of Architects a draft outline copy of their "Bill for the Registration of Practitioners in Architecture," which Bill has been made a Government measure; also an extract from the address of the President of the Institute in support of the Bill, which is an Architectural Education Bill, similar to the Bill before the British House of Commons; there is no doubt but that under such favourable auspices it will pass the Colonial Parliament. Reviewing the position of this question of the Architects' Education and Registration Bill, and having regard to the fact that other countries are promulgating similar measures, and that adverse critics are becoming more pronounced in their hostility, but less numerous, I am glad to think that the "flowing tide" is with the Bill. The public generally are under the impression that such an Act has been in the Statute Book for generations, and those to whom I have spoken upon the subject expressed astonishment that such is not the case. I trust that in the near future Architectural Art Education will be provided for under the Architects' Education and Registration Act; in the mean time, the question should be discussed with calmness and deliberation befitting the importance of the interests involved.

Mr. SETH-SMITH proposed a cordial vote of thanks to the President for his address, remarking that its lucid exposition of the position of the Architects' Registration question was a good omen for the usefulness of the session. He regarded the world's congress of architects to be held at Chicago next summer as an admirable suggestion likely to bring professional men of many nations into touch with each other; he trusted that the question of registration would be discussed at that gathering. Those who had read the work lately published by the Memorialists must have been struck with the diversity of views held by the writers.

Mr. MARSHALL ROBINSON, of Bolton, seconded the vote of thanks, which was supported by Mr. E. J. HAMILTON, of Brighton, and carried by acclamation.

The President, in reply, said he was amused when he read the Memorialists' book to see how lame in argument and contradictory in statement these pleas were. It was suggestive that thirteen combined to write the essays, and that the outcome was a book which was only gilt at the top, and was crude and rough in all other respects.

THE ANNUAL DINNER.

In the evening the annual dinner was held at the Holborn Restaurant, the President in the chair. Among those present were:—Sir William H. Marling, Mr. L. Atherley-Jones, M.P., Mr. Wyke Bayliss (President of the Royal Society of British Artists), Mr. J. W. Wilson (President of the Society of Engineers), Rev. P. S. O'Brien, D.D., Mr. H. H. Bartlett (President of the Builders' Institute), Mr. W. H. Seth-Smith (past-president), Mr. Edgar Farman (hon. secretary), Mr. E. Day (vice-president), Mr. E. J. Hamilton (vice-president), Mr. H. Adams, M.Inst.C.E., Mr. William Woodward, A.R.I.B.A., Mr. Ellis Marsland, Mr. G. Highton, F.R.I.B.A., Mr. G.

Baines, F.R.I.B.A., Mr. Bassett Hopkins, L.C.C., Mr. W. Allport, F.S.I., Mr. E. J. Kibblewhite, Mr. E. S. Tidman, F.S.I., Mr. R. Cruwys, F.S.I., Mr. Sydney Marsland, and Mr. G. A. T. Middleton (secretary).

The toast of "The Queen" having been duly honoured, the President proposed "The Clergy of all Denominations," to which the Rev. Dr. O'BRIEN responded. Mr. E. J. HAMILTON proposed "The Architects' Registration and Education Bill Committee," remarking that the Bill was especially needed in the provinces. When passed, it was bound to prove beneficial both to the architects and the public. Mr. ATHERLEY-JONES, M.P., said that, as the Member of the House of Commons into whose hands had been confided the honour of looking after the interests of the Bill, he had singular pleasure in replying to the toast. He believed that the Bill had been conceived in no sordid or narrow interest, but that the motive which had actuated its authors was to secure the application of better materials, sounder methods, and more scientific principles in building. The ancient idea of architecture embodied strength, utility, and beauty, and modern practice had added sanitation. It was not necessary that an engineer should be an architect, but it was necessary that an architect should be an engineer; and such was the purport of the Bill. For years past the Legislature had devoted itself to sanitary legislation; yet they were constantly met with complaints about the absurdly inefficient materials and outrageously unscientific methods employed for the purpose of building houses. Therefore the society had come to the conclusion that a Bill should be passed to confer security on the public upon this point. Mr. G. BAINES, F.R.I.B.A., proposed "The Fine Arts." Mr. WYKE BAYLISS, President of the Royal Society of British Artists, replying, said that the poets seemed to know very little about architecture, for they dreamed that they dwelt in marble halls, but it was only a dream, and when they came upon gorgeous palaces and solemn temples these dissolved away, which was the very last thing that an architect would like to occur to his work (laughter). Dante talked about everything else in the world that then existed except architecture; he dismissed Venice as a kind of furnace, and recorded the petty squabbles of Florence, but nothing of its buildings, and the only city he described was in the heart of Hell, where no doubt he thought the architects should be (laughter). With regard to painting, architecture had no better servant nor more terrible master than the painter. When at any time in the history of art the work of the architect had been transferred to the hands of the painter, architecture had been degraded. Perfect architecture depended on the conception of the building being carried out from first to last perfect in itself, into which pictures might be brought, as men and women, sculpture and music would afterwards enter. When Michael Angelo and the other painters of the Renaissance began to build the Italian churches, instantly stucco arose, because it was the best thing to paint on, and they erected buildings for the purpose of making walls to paint their pictures on. He had an infinite regard for sculpture, but our climate was against it, and made its use difficult. But there was one of the loveliest things in the world that we Englishmen could cultivate, and that was the art of wood-carving (cheers). It seemed frightful that this art should not live out its life and be seen in exhibitions as pictures were seen. "The Society of Architects" was proposed by Sir W. H. MARLING, and responded to by the President. Mr. H. ADAMS gave "Science," and Mr. J. W. WILSON replied; Mr. W. L. YOUNG proposed "Architectural Art," and Mr. W. H. SETH-SMITH responded; Mr. ELLIS MARSLAND, "The London County Council," Mr. BASSETT HOPKINS, L.C.C., replying, and Mr. A. STONER, F.S.I., in conclusion, proposed "Architectural Crafts," Mr. H. H. BARTLETT, President of the Builders' Institute, rising in response.

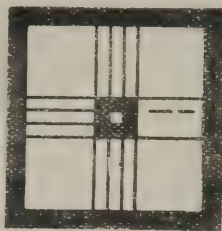
THEATRES.—XII.

By ERNEST A. E. WOODROW, A.R.I.B.A.

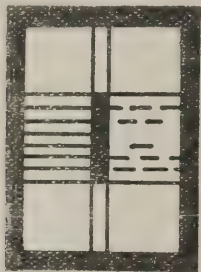
IN reading accounts of disasters from fire and panic in theatres, the most harrowing details are found to be those which describe the fearful struggles and blocks occurring on staircases. When people rush madly down the stairs, these

behind pushing those in front, the inevitable consequence is that some must stumble and fall, while others trample on, or fall over them, until a human barrier absolutely fills up the space from wall to wall, and from floor to a height scarcely credible. In the Gateshead disaster, last year, the living and dead lay together in a heap of five deep on the gallery staircase, with a struggling mass of panic-stricken creatures behind them, unable to proceed further on account of the awful mass before them. With these known facts to guide him, and a knowledge that they have occurred, not once or twice, but many times, with what sense of anxiety and responsibility must the architect proceed to design the staircases for any public building! Is it possible to design a staircase in such a manner as to entirely obviate such disasters? It is possible to vastly improve upon the form, construction, and planning of many staircases that have had to do

largely governed by the site and its possibilities. Now I contend that the site *must* be such as to admit of the requisite number of exits—in fact, in London this cannot in any way be overcome.



C



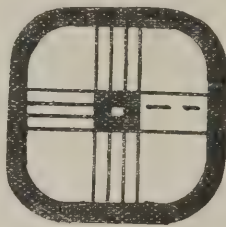
A

duty for the public for years past. There was, in years gone by, too often a tendency to disregard the requirements of the cheaper parts of the house, and the gallery had to content itself with only one staircase—narrow, and with winders at every turn. It is indeed fortunate for us that such a state of things as this is of the past, for it is no longer possible for anyone to construct such death-traps in London for the use of the public.

Before quoting or commenting upon the English and foreign rules and regulations with regard to staircases, I will shortly review the opinions of certain writers of late years on this subject. It will be within the recollection of my readers that Mr. Ralph Nevill dwelt fully upon this question a few years since, in a paper read by him before the Institute of British Architects. Speaking

Speaking specially of staircases, Mr. Nevill remarked that many poems have been sung of late over the supposed happy innovation of straight flights and exits, but that in his opinion "a more frightfully dangerous arrangement" could not possibly be concocted; for how, he asked, would it be possible to stand against the direct pressure of one or two hundred people? "Surely," he said, "no such stairs ought to be licensed, unless it be divided up with a hand-rail to every person . . . this mischievous idea has been advertised as one of the advantages of Mr. Irving's theatre" (see section A B, page 383 of this volume of the BUILDING NEWS).

It is true that long, straight flights are most objectionable and dangerous, and that it is all important to distribute the crowd, and prevent the whole pressure being brought to bear on any one part of the staircase. There should therefore be



C2

intermediate landings to break up the flights, affording persons a chance of resisting the pressure from behind, besides giving a resting-place for those ascending, as well as those descending; in considering the arrangement of staircases, we must not lose sight of the fact that with a sunk pit people have to ascend to reach the street. Facilities for entrance should also not be overlooked while considering the more important part of the question, of facilities for exit. The London County Council recognise an evil in long, straight staircases, and provide against it by insisting that no staircase shall have more than two flights of twelve steps each, without a turn.

To return to Mr. Nevill's paper, in which he pointed out that the ordinary form of stair is the square or oblong, with landings at the ends or corners, "the weak point of this form is that at



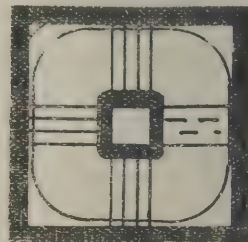
B

upon entrances, exits, and staircases, he observed that these subjects were particularly within the architect's province, and that the best form of stairs was especially one that could be "easily grasped." With regard to entrances and exits, they must of necessity be largely governed by the site and its possibilities. There could, said Mr. Nevill, be little difficulty where space could be had all round a theatre, as at that which was then being built by Mr. Phipps in Shaftesbury-avenue, (now known as the Shaftesbury Theatre); he pointed out that Mr. Irving's plan (illustrated in Chapter VII. in the BUILDING NEWS of September 16) not only required a space all round, but two good roads were needed on each side, suitable in capacity and direction for the procession of carriages, and without such roads the plan would collapse. These remarks read as if the writer thought that the exits should be made to conform to any given site, as he says they must be

every landing, whilst the inside man has a very sharp and nasty turn to make, the outside man has a long way to go, and if there is much pressure behind he is projected violently into the

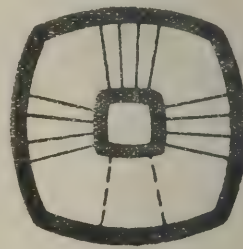
empty space." Anyone ascending a staircase should, he remarked, take the trouble of observing his neighbours, and note their relative positions when they reach the top; he will then be surprised to find how far apart they are scattered. "If such dislocation is possible going upstairs in no particular hurry, what must be the case, in panic, coming downstairs?"

Much has been said from time to time of the various forms which staircases in theatres should take, and I have reproduced here, a series of diagrams, which Mr. Nevill used, to illustrate his views on the matter. The worst form of landing stair, he said, is that shown at A, in which there are only two risers in the centre of the landing. I would point out that the Council's rules will not permit of any new building having staircases with flights of more than twelve steps, or less than three, so this arrangement of two steps at the half-landing would not be allowed. There is



E

certainly great danger of stumbling over steps placed thus unexpectedly at a sharp turn of a staircase. The best form, according to Mr. Nevill—and undoubtedly it is a good one—is that of the Prince of Wales's Theatre gallery staircase, in which four risers in a flight go round a square centre. (Fig. C.) The rounding off of the corners of the square landing by hand-rails is a custom now frequently adopted, as it destroys the corner "pocket," into which the weak may be thrust and held there by the passing crowd. (Fig. C1.) A suggestion comes from the writer whose exhaustive remarks on the subject we are now considering, that a barrier should be put instead of a hand-rail, leaving a space of 15in. in the middle of it, to form a convenient refuge for anyone faint or over-pressed, to enter and regain breath. (Fig. E.) The fear to my mind is that they might be trapped, and unable to get out again, because of the pressure



F

of the crowd; or, on the other hand, people might be forced in against their will, and be prevented from proceeding down the staircase. Mr. Nevill, however, said he would not deliberately build a square corner for this purpose; but if the empty space were there it might be utilised in this manner. It would certainly be put to better use, than by being filled with a pay-box, as is sometimes the case.

With regard to the description of the remaining diagrams, I quote the writer in full:—"The radius of a circular staircase would have to be too large to be practicable; but in an ellipse, as Fig. B, the steps at the sides may be set to a very large radius, and the small ends used as landings. The objection to winders does not, of course, apply to treads of this description. I may point out that the ascent of a staircase on an ample curve is much less fatiguing than that of a square stairs, where one has to make an unpleasant turn at every landing. Old people



D

always complain of this. In our large mansions we have instances of curved plans; but they are unfamiliar to us, as most of our stairs in England are modelled on those constructed of oak, where such an arrangement is not possible. In France, on the contrary, where stone governs design, they are common. The elliptic curve may be applied with equal advantage to the sides of a triangle, or of a square, as in Figs. D, F, and



G

H. One of the chief objections to the square landing may be taken away by treating the flights as in Fig. E—that is, by not carrying the steps so far as the inside corner of the wall.”

Sir Eyre M. Shaw's views upon this particular point, are that stairs with bends at a right or even an acute angle are much safer than straight flights. A uniform movement of persons passing down a staircase is to a certain extent desirable, particularly in a panic. Angles in the stairs interfere with this uniformity to a certain degree, as the persons on the outside of the bends have a greater distance to travel than those on the inside; but the absence of pressure is of greater importance than uniformity of movement, and, consequently, where great crowds have to pass downstairs angles are very useful. “In some buildings, too, it may be possible to construct stairs with angles in alternate directions, first right and then left, and thus, to a certain extent, to combine uniformity of movement with absence of pressure.” Mr. Buckle, speaking of theatre staircases, says that they should be as near as practicable to the point of exit without intervening passages. Their arrangement will exercise the ingenuity of the designer if safety, convenience, and economy are properly considered. Staircases should invariably be wider than the passages or corridors leading to them, the reason being that crowds move less rapidly on the staircases than on the level. This latter remark is



H.

one that the architect should bear in mind, for a staircase, that is fed too rapidly from the auditorium, will be sure to become a source of danger, and be easily blocked.

Mr. Buckle's theory is to abolish staircases and to substitute sloping ways. Even were this not done in the wholesale way advocated in his “Safety Theatre,” it should be adopted in all cases to overcome slight differences of level in the passages. “As to differences of level, it will be found that gradients not exceeding one in ten are perfectly safe for a crowd, and that even the smallest steps are more or less unsafe. Where there is a gradient, however, it is most desirable to avoid any pressure near it, as persons, after entering a gradient downwards, involuntarily attain an increased speed, and if this be further accelerated by a pressure from behind, accidents happen. This danger, however, is easily guarded against,

either by having the entrance to the gradient at a wide angle, from the communicating passages, or by a simple arrangement of barriers at alternate sides, reducing the number of persons in each compartment, so to speak, to about fifty or thereabouts, as this number cannot create a sufficient pressure to do injury.” I quote again from Sir Eyre M. Shaw's “Fires in Theatres.”

Having pointed out the danger of single steps as stumbling-blocks, I have now to draw attention to the objections of irregularities and differences in the rise and tread of steps in staircases. Anyone who comes suddenly and unexpectedly upon a step that is higher or narrower than those over which he has just passed, runs a very great risk of falling, and a fall on a staircase, in a panic, is fatal. A change of “going” from one flight to the next is also most objectionable, for the same reasons. At the best of times it is, to say the least, uncomfortable to have to suddenly change the length of one's stride in ascending or descending a staircase; yet there is often a tendency to vary the rise, or tread, of a flight to work in the staircases to the fixed levels of the corridors; but the dangers are so great that the temptation must never be given way to. The Council demand that the treads of the steps shall be not less than 11 in. wide, and the risers not more than 6 in. high, and that there shall be no winders, but the treads of each flight shall be uniform in width. This rule would throw out of court the elliptical and curved staircases advocated by Mr. Nevill and illustrated above, in spite of his arguments of the additional safety of his plan, and in designing a theatre for London there is no departure from the rules of this municipal body, permitted.

It is universally accepted that winders in a staircase must, under all circumstances, be omitted, on account of their extreme danger. When referring to the foreign rules, we shall find this is enforced in all countries. The question of the width of tread and height of riser must be governed, of course, by the character of the staircase; what is suitable for an East-end gallery is not good enough for an opera house grand staircase; yet no staircase ought to be of poorer dimensions than those insisted upon by the Council. The wider the tread, the shallower the rise, of course, it follows, the better and the safer the staircase for public use.

The importance of the planning of a theatre staircase is so great, and the opinions and rules on the subject so many, I cannot dispose of them in one chapter. I shall, therefore, only refer to one more detail at present, leaving the rest of the question for a future article.

Everyone knows that, on both sides of all staircases and flights of steps, there should be hand-rails for the people to cling on to, to prevent them being thrown over by the pressure from behind. Continuous hand-rails must be fixed on both sides of all steps and landings of a London theatre, and be supported by strong metal brackets built into the wall. The hand-rails must be chased into the walls, where the thickness of walls will permit; but in all cases where the flights of steps return, the newel wall must be chased so as to allow the hand-rail to turn without projecting on the landing or diminishing the available width of the staircase. Many writers have advised dividing hand-rails, and some have advocated that the staircases should be subdivided by several hand-rails from top to bottom, making a series of narrow staircases just wide enough for people to pass out in Indian file. This, indeed, may have its advantages, but great width of staircase would be required. Economy of space almost forbids the adoption of this arrangement. If, however, the staircase is just wide enough for four to go up or down abreast in comfort, those next the wall will find the support from the rail sufficient to allow the two in the centre to lean on them. Sir Eyre M. Shaw writes that in inclosed passages and staircases, hand-rails at a distance of about 3 in. from the walls on both sides are always an advantage. It is true that they occupy some space, and this is against them; but, on the other hand, they almost invariably prevent persons falling down and being trodden on. When a crush comes, the persons at the sides hold on to the rail, and those in the middle hold on to them, and it is most unusual with such an arrangement for anyone to be trodden on, whereas in passages without a rail there is nothing to prevent persons falling, and when they do fall, the consequences are most serious, not only to themselves through being trampled

on, but to all in the vicinity, on account of the obstruction, and the increased impatience or panic which is sure to follow it. A hand-rail has also the advantage of giving those near it something to hold on to, thus enabling them in some measure to regulate the speed, and so diminish some of the worst consequences of a rush. Such is the opinion of one of the greatest authorities in the world on theatre fires.

IRON ARCHES OF LARGE SPAN.—IV.

CAST IRON.

ONE of the principal points of difference between an arch of metal and its prototype of masonry or brick is, that the latter two are regarded as incapable of resisting a bending moment, any action that might arise in this respect due to the tenacious qualities of the mortar or cement in which the voussoirs or bricks of the arch-ring are set being neglected. In a stone arch, each voussoir may be considered theoretically as joined to its neighbours by a hinge, through which the pressure would pass, and if the centres of the hinges coincided with the medial line of the arch, then the true line of resistance would approximate very closely to it. These conditions would probably not apply with the same force to a metallic arch constructed of voussoirs or blocks, of which we gave an example in a former article on this subject, although the principle of construction is the same in both instances. If we were further to assume that each separate segment of a cast-iron arched rib were to represent simply a long voussoir, it might be difficult to determine exactly where the bending action would first take place. If we further suppose that the length of the segments was increased until each was equal to the semi-arch, the case resolves itself into that of a pair of inclined rafters meeting at the apex. This is a far more correct assumption than that of considering an arched rib in the light of an assemblage of separate curvilinear pieces, resting upon two supports. It may be viewed as one single arch or vault constructed of a material susceptible of deflection and deformation, without, within certain limits, endangering the equilibrium of the structure. Actual experiments, of which we shall give a practical example, have proved that when subjected to loads cast-iron arched ribs undergo a flattening at the crown, the general tendency being to shorten the arc and lengthen the chord. The amount of deformation which the normal curve suffers, although it varies with the load, bears no direct proportion to it. In all cases it is very slight, and after experiencing it, the arcs remain nearly circular.

In the “Système Polonceau,” of which we gave, in section and elevation, an example in our last article, we drew attention to the action of the bolts. The halving of the two elliptically-shaped ribs rendered it necessary for the bolts to be continuous along the face of the arch both on the extrados and intrados; but as the whole rib is composed of so many segments of these compound sections, the radial joints in the depth of the rib require bolts through their flanges in common with all segmental cast-iron arched ribs. Face bolts of this description have two functions to fulfil. In the first place, they must make what is termed “a good joint” between the contiguous segments, and must also be strong enough to prevent any overturning of the arch, owing to the action of external transverse forces, the tendency of which is to cause one segment of the rib to slide upon another in the plane of the joint. An iron arch will not fail in the same manner in which the ordinary fracture of a common stone arch takes place. Auday, Coulemb, Poncelet, and other authorities confirm the statement that in the latter instance the arch fails by the voussoirs opening at the soffit of the crown, and at the extrados at two points in the haunches or reins of the arch, one on each side between crown and springings. That face-bolts in the radial joints of an arched rib do not serve for the transmission of pressure is proved by the fact that arches have been “struck,” and remained perfectly sound for some time after erection, without the joint bolts being tightly screwed up, or the threads of the screws evincing an indication of wear. Practical experience confirms, therefore, what has been already stated respecting the action of bolts in butt joints exposed wholly to a strain of compression.

The idea conveyed in the adoption of the elliptically-shaped section is clearly seen to be the attempt to increase the stiffness of the rib at the centre of its depth. Another method of obtaining the same result is shown in the cross-section in Fig. 8, which presents

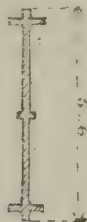


Fig. 8.

some points of interest. The example is that of the cross-section of the cast-iron arched rib of the railway bridge over the Rhone at Terascon. This structure consists of seven segmental arches, having a span of 197 ft., and a rise of 16½. The total depth of the rib is 5 ft. 6 in., which is large compared with the dimensions of the span, as is generally the case in cross-sections other than those belonging to the equal double-flanged system. The section in Fig. 8 may, however, fairly claim to belong to that form, for we may neglect the small central stiffening flange, as its projection beyond the plane of the face of the rib is barely 2½ in. The width of the upper and lower flanges is 1 ft. 4 in., and taking the available depth for calculation to be the distance between the respective centres of gravity of these two flanges, we have its value equal to about 4 ft. As the weight of an arched rib is directly proportional to its sectional area, the latter should be kept as small as possible, consistent with the strength required. Any excess of area beyond what this requisite demands must be regarded as so much extra dead-weight, which does not only not increase the strength of the structure, but to some extent impairs it, and in addition, augments its cost. It is doubtful whether the two vertical prolongations of the central portion of the rib beyond the upper and lower flanges, shown in Fig. 8, contribute in any appreciable degree to the strength of the section. Presuming that they do, and the small central flange as well, put A to represent the total sectional area of the rib; let d equal its extreme depth from out to out, b equal the breadth of either horizontal flange, b_1 that of the small central flange, and put t for the uniform thickness, which is equal to 2 in. Then

$$A = t [D + 2(b - t) + (b_1 - t)] = 199 \text{ square inches.}$$

We shall compare this area with that of the most recent, and one of the best designed cast-iron arched ribs in England, and also with that of some Continental bridges. We shall adduce this example in a future article, as being like the one under present consideration, a railway bridge, and of almost identically the same span, and also under the same practical conditions of loading.

It will be seen from an inspection of Fig. 9, which represents the skeleton elevation of one half of the rib of the Terascon bridge, that the spandrels of this arch are different, both in



Fig. 9.

design and construction, to those belonging to the Pont du Carrousel, illustrated in our last article. The spandrels in Fig. 9 are of the solid sided or plate type, and consist of a framework composed of vertical standards or pillars placed at a certain distance apart, and the spaces filled in with cast-iron plates or panels, which play a subordinate part in comparison with the standards, in transmitting the weight of the "track" and that of the rolling load to the arch beneath. It by no means follows that the whole duty of the spandrels of an arched rib is restricted to a mere transmission, or transference, of the dead and

live weight over the arch. The manner in which the stresses on the spandrels themselves are effected, will depend in great measure upon their method of attachment, or "articulation," to the rib itself, as well as to the horizontal upper chord, or stringer, belonging to the arch, as will be subsequently pointed out more fully. If the spandrels be rigidly connected to both the rib and the longitudinal chord, as occurs frequently in arches of wrought iron, then the whole may be regarded as one piece of solid framework, and the resistance to a bending moment will be shared in different degrees by each component. There are very few experiments extant, respecting testing to the point of fracture—the only reliable test, after all—either cast or wrought-iron ribs. In all the experiments undertaken with ribs of the former material, the arch failed by the breaking of the metal in the reins or haunches. It should also be noted that the failure always took place before the ultimate crushing strength of the cast-iron was reached. This result must have been due to one of three causes: the haunches or spandrels may have been badly designed, and therefore too weak for their work, or improperly connected to the rib. The metal itself may have been of inferior quality throughout, and in addition, the form or cross-section of the rib, as is very probable, was not that which theory and experience have since pronounced to be the correct one for constructions of this description. In stating that the spandrels may have been too weak, it must not be taken for granted that they were not strong enough to do their own share of the work, for they might have been too weak to resist the stress brought upon them by the deformation of the rib itself. The latter also, owing to imperfect designing, would likewise be subject to more deformation than would be the case with a properly proportioned section.

CARPENTRY AND JOINERY.—XLVI.

WAINSCOTING (continued).

WAINSCOTING containing panels reaching from bottom rail to top rail have been dealt with—that is, one panel in height only; but it will be readily seen that this would suit only wainscoting of a very limited height, unless variety were obtained by planting a surface moulding upon the panel, and thus working out a number of fancy geometric designs which would give a necessary variety.

Fig. 303 gives a few outlines suitable to work to, in order to take away the plainness. For the carrying out of these designs, one important consideration is required—namely, that the moulding planted round the framing be such as that the moulding forming the geometric design will mitre into its members, or, at least, some portion of them.

Fig. 304 gives three examples of mouldings suitable for the purpose. On the left-hand side is the moulding in full, and on the right side is the portion of the moulding which is used to form the geometric figure upon the panel. A dotted line is shown on the full-sized moulding to show to what point the other moulding will mitre, and also that the same dotted line divides the surface moulding in two. The three examples given will enable the reader to know just exactly what kind of moulding will be suitable for the purpose stated. It needs hardly be said that these little mouldings are mitred carefully to the design which may be marked upon the panel; they are then glued and bradded (sprigged) to. Of course, if it is only for painted work, it may do to dispense with glueing; but, if in hard wood, these mouldings must be put to with needle-points. In mitring, a bevel-edged chisel will be found very handy.

Where it can be used, a mitre-plane comes in useful for this class of work. It will be seen that the first moulding shown in Fig. 304 is a moulding which may be wrought upon the solid, and therefore very suitable for oak and other hard woods. If any of these are used, as has been previously stated, they should be put on with needle-points—or, better still, a fine line may be drawn on each side of the moulding to mark its place, and then the panel bored for screws, and the moulding screwed to, a little glue being previously put upon the back of the moulding. It will be readily seen that these designs can be wrought upon any panel-work, and that they are not confined to wainscoting only.

Passing on from wainscoting having only one panel in its height, and allowing the reader to treat it in any of the methods suggested, or to develop a new one which may occur to him

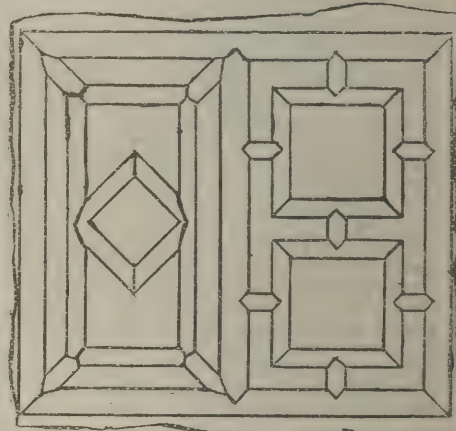
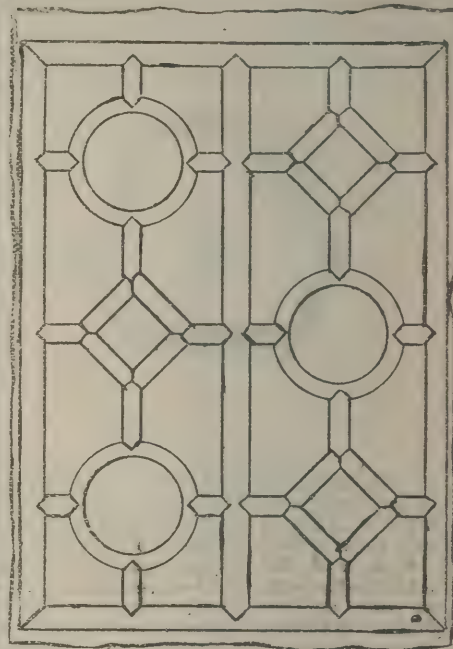


Fig. 303.

through any suggestion here given, we come naturally to wainscoting two panels in height, and then the question arises, How should they be divided?

Fig. 305 gives two elevations to solve the problem, one being only a skeleton. In the one case a square panel is arranged at the top, and the bottom panel is such as the height of the

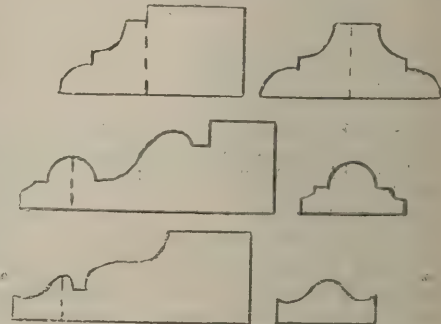


Fig. 304.

framing will allow. In the other example, that in skeleton outline, what is termed a *lying* panel extending over two lower panels is adopted. In both these cases every other muntin should run through—in the skeleton one it is necessary, also in the other one for sake of the framing to hold it well together. It will be found in practice

that the alternative muntins going through in this way, and the intermediate rail being broken up, it is easy to keep the framing straight; but if it is attempted to run the intermediate rail all the length, the framing will not wedge up without a great deal of trouble and the use of



Fig. 305.

pins or screws to assist. The screws would be put in from the back side, not extending through; and the same may be said of the pins, although often they are bored for and driven from the front. These alternative muntins should be mortised through both top and bottom rails. This style of wainscoting may be much improved by the use of raised panels, such as have been described for entrance doors. One of the simplest

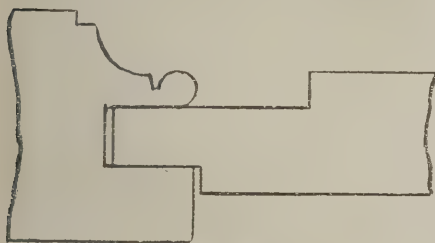


Fig. 306.

and most effective panels of this class for wainscoting is shown in Fig. 306.

The first thing noticed in the figure is the moulding, which is composed of a fillet, scotia, and bead, and this moulding is worked on the solid. The ploughing or grooving for the panel is made of the size shown, so as to allow sufficient strength at the back.

The panel is next noticed, and how simple the raising is, showing a sunk face and margin from the bead. This margin should be equal; a little care in the rebating to fit the plough groove will make this all right, providing the panel is made correctly to the size. Supposing there is a looseness in the panel, and the margin not correct on that account, adjust it, and then put one or two needle-points in through the bead, and this will keep it stationary.

Supposing wainscoting such as shown in Fig. 306 were to be made of oak, then, as stated in connection with Fig. 305, the alternative muntins would be put through for ease in wedging, and also it is easier to pare out a mortise when it is through, as considerable time is occupied in getting out the core, and the tenons must be the proper length, or even a little shorter, so as that the shoulders will bear rather than

the tenon. When all things are taken into consideration, it is the readier method to mortise through. There is no comparison in wedging up, as these alternative muntins divide the framing into equal portions, each of which may be said to be self-contained; all that is required being to have the cross, or horizontal pieces, sufficiently long to keep all shoulders close joints.

Fig. 307 gives a moulding suitable for the base



Fig. 307.

or skirting of this wainscoting. It is advisable to rebate the wainscoting a little, so as to suit this; that is, the bottom rail should show a little more than the top one, and be rebated from this point downwards—say $\frac{1}{4}$ in. deep. The object of this is that when the skirting is put on, and, if a shrinkage occurs, the spectator does not look directly down upon it; but must stand off, and even stoop, unless he is a good way off, to see the trace of shrinkage.

Fig. 308 shows a moulding suitable for a capping to the wainscoting. This is taken from actual work, and no difficulty should present itself in putting it on, as it is nailed to the ground, and may be nailed a little to the framing also. Of course, in a hall, and with a wainscoting 4ft. 6in. or 5ft. in height, a more massive skirting may be required, and in such case there may be, in addition to the base moulding, a plinth (double faced) corresponding somewhat with the skirting, as shown in former figures, say Figs. 294 and 295. The capping and base should be scribed where possible, and also the moulding of the framing shown in Fig. 306. The moulding spoken of

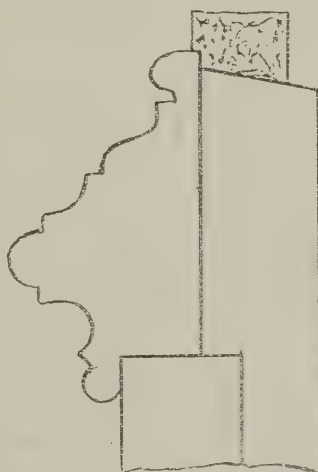


Fig. 308.

can only have its scotia scribed, as the bead, being a return one, requires mitring. This will cause a slight complication; but these points, with a little care on the part of the workman, will enable him to carry it out satisfactorily.

The writer has found the readiest method for this class of work is to have a little pattern of one of the stiles or muntins, and use this in setting the mortise gauge, which will enable the workman to see how far he can bring his mortise forward, and then when tenoning and mortising is done and all ready for fitting and scribing, put each tenon into its respective mortise, and mark the bead where the two beads meet, and then mitre and scribe accordingly.

A. C. SKILLING.

BRICKS AND JOINTS IN BRICKWORK.

—II.

BEFORE dismissing the subject Fletton bricks *versus* London stocks, it is well, perhaps, to remark that the inferior Fletton bricks are pale backed, and in appearance a pale whitish-red colour. Some of these bricks when struck with the brick-trowel, in the act of reducing the brick to a bat or three-quarter brick, shiver to pieces, an evidence of the want of cohesion in the body of the brick, due to the refractory nature of the clay, combined with insufficient pugging and firing. Fletton bricks might be theoretically objected to as a backing to London stock-facings on account of the difference in thickness of the two kinds of bricks—stocks requiring $\frac{3}{4}$ in. bed-joints and Flettons $\frac{1}{2}$ in. bed-joints to make the brickwork rise vertically four courses to a foot. The strength of a wall depends so much upon the quality of the mortar used that, though faced with stocks on one side and Flettons on the other, yet, under certain conditions, it may be practically as sound as a wall built wholly of one class of bricks. In first-class mortar the ingredients are clean, sharp sand (silex) and lime in the usually prescribed proportion—viz., three measures of sand to one measure of greystone lime; or, two measures of sand to one measure of blue Lias lime, which will yield or shrink very little, if any, in the process of drying. The reason of this is to be found in the fact that the proportions are such that the lime when slaked has no great excess over the quantity required to fill the interstices between the angular grains of sand, driven closely together in the act of laying the brick. The mortar being thus closely compacted, no appreciable shrinkage takes place. The same cannot be said of bad mortar, or even otherwise good mortar, which has been overground in a mortar-mill to such a degree of fineness that the angularity or body of the sand has been eliminated.

The general make and uneven beds of London stocks require $\frac{3}{4}$ in. bed-joints to make satisfactory work, both with respect to soundness and appearance. The Fletton bricks, on the other hand, having true and regular beds, admit of $\frac{1}{2}$ in. bed-joints. There could not, perhaps, be any better practical test of the comparative merits of the bricks in question as building material than that which would be afforded by pulling down two walls of long standing which had been well built under exactly the same conditions—one with Flettons, the other with stocks. In the case of the stocks it would be found (a consequence of their ability to knit together in the mass) that the fracture occasioned by pulling the work to pieces would often take place through the body of the hard stocks, while the Flettons, with their well-finished faces, affording less adhesion for the mortar, would separate and leave the mortar-joints much more readily than in the case of stocks.

In the choice of bricks, those having a "frog" on one of the beds are to be preferred (all other conditions being equal) to those without a frog. The bed in which the frog is formed distinguishes that as the upper bed of the brick. The upper bed in hand-made stocks is generally found to be slightly longer than the bottom bed, to admit of the brick in the clay state leaving the mould, which, to some extent, accounts for the bevelled headers or ends of the bricks. Such bricks when abnormally bevelled cannot possibly be laid in any other way than frog upwards, which, if departed from, would cause the lower edge of the brick to project, to the extent of its bevel, beyond the face of the lower brick upon which it was laid; the upper edge of the brick in all cases, sailing courses excepted, being laid to the brick-layer's line. In sailing courses the lower edge of the brick is laid to the line. When the ends of the bricks are much bevelled, the bricklayer finds it necessary to snap the bricks in two, and bed the snap-headers transversely out of level, or dipping into the wall, so as to bring the end of the brick into the same vertical plane as the brickwork below it—a practice admissible only to a very small extent. The original intention of the frog was to drive the clay well into the brick mould, and to form a dowel for every brick when laid in the wall. In some of the heavier and more costly kinds of bricks, made at a considerable distance from London, this idea is taken advantage of for the double purpose of economising the clay and reducing the cost of freightage, by making the bricks with a deep frog on both beds of the bricks. In estimating for work with bricks of this kind it should be borne in mind

that more mortar will be required for a given piece of brickwork than if executed with bricks having one frog only. The writer has noticed this peculiarity more in glazed bricks than in any other kind. In such instances (on account of the smallness of joints in glazed work) it is well to have the frog in the bottom bed of the brick filled in by the bricklayer immediately before laying it on its mortar bed, to obviate the possibility of flushing the glaze by the superincumbent weight being thrown on the outer edges, instead of upon the whole area of the brick. A brick having a frog admits of closer and sounder bedding than a brick having no frog, unless special precautions be taken in well soaking the latter brick and bedding it in fine mortar, a course not usually pursued unless under strict supervision. Makers of glazed bricks seem to have an idea the joints cannot be kept too close, the bricks admitting in some instances of not more than $\frac{1}{16}$ in. bed-joints. The idea, though true in principle, is unsound in practice, as neither sound nor satisfactory work—as far as appearance goes—can be made with such very fine joints. The joints should not be less than $\frac{1}{8}$ in., and not more than $\frac{1}{4}$ in.; and even then it would at times be found necessary to sort or gauge the bricks to an even thickness before laying them, owing to an unequal shrinkage of the clay in firing. The bed-joints are sometimes regulated to a uniform width by the bricklayer, after the work is built, by cutting off the irregularities with a hammer and boaster (a broad-bladed chisel about 5 in. wide), a practice which should, if possible, be avoided, for fear of flushing the glaze. In selecting glazed bricks it is advisable never to be wholly guided by sample bricks, but rather to examine them in some piece of work previously built, and which has stood some little time, carefully noting if craze or other defect be present in the glaze. The craze, in appearance, is somewhat like the crackle in china. John Sparkes, director of the Lambeth School of Art, in describing glazed ware, says: "To make this were perfectly able to withstand the effects of atmospheric attack, two points are necessary to be attended to. One is that the body and the glaze shall be so perfectly fitted for each other that there shall be no uneven and different contraction. Crazing, as it is called, on glazed ware is the effect of two materials that do not pull together, so to speak, and is to be avoided." Glazed bricks are divided into dip glazed and salt glazed. The latter are a brown colour, peculiar to salt-glazed ware, and though sometimes mottled in appearance, due to the salt and other causes, possess an almost imperishable glaze, and are therefore peculiarly well suited for exterior street dados, and where subject to rough usage. The salt glaze "is fired and glazed in one operation. During the first firing, which converts the brittle and useless clay into impervious ware, when an intense white heat is reached, salt is thrown into the salt-glazing kiln either from above, through holes in the crown of the kiln, or into the fire-holes, or both. The intense heat decomposes the salt, which is changed into a gaseous fume or steam. One constituent of the salt, the chlorine, escapes out of the kiln as vapour. Another portion, however, the soda, as it flies through the kiln, meets the white-hot ware, in which is always a portion of siliceous or flint, and forms with it a silicate of soda, or soda-glass." The dip-glazed bricks, previously fired, are first coated with a fine white clay in slip form to cover the rough body of the bricks, and as a medium to receive the glazing material. The clay used to form this coating or slip is mostly Staffordshire china clay. The dip-glaze sometimes parts from the body of the brick, but the salt-glaze always remains immovably a part of the brick.

F. WALKER.

THE SURVEYORS' INSTITUTION.

THE opening meeting of this society was held at 12, Great George-street, Westminster, on Monday evening last, when the President (Mr. C. J. Shoppee) delivered the customary address to a large and representative gathering of members. After expressing his gratification at the distinction conferred upon him by the members in placing him in the proud but responsible position which he occupied, Mr. Shoppee proceeded, as an urban surveyor, to disclaim any wish or pretension to deal authoritatively with subjects which affected only the agricultural branch of the surveyors' profession; and, coming to a subject eminently within his own line of practice, dealt, in a few well-chosen and weighty

words, with the report of the Town Holdings Committee. The subjects of reference to that committee he classed under three general heads—(1) Leasehold enfranchisement; (2) the direct assessment of ground rents, and of increased values imparted to land by building operations; and (3) the taxation of vacant building land. The committee had come to the conclusion that leasehold enfranchisement would not, on the whole, have much practical effect in improving the quality of houses built. They were also not convinced that the power of enfranchisement would be generally taken advantage of, especially if coupled, "as must in fairness be the case," with provision to secure to the reversioner the value of his property, and compensate him for the injury inflicted. The direct assessment of ground rents and of improved land values arising from building operations were dealt with in the committee's final report. "The idea," said they, "that ground rents are a class of property that at present escapes assessment for local taxation is, of course, erroneous. The basis of all rating is the whole annual value of the building and the ground on which it stands, regarded as one entire property." The committee came to the conclusion that the ground landlord bears the burden of all rates current at the time he leases the land; but that fresh rates imposed during the run of the lease fall on the lessee. The proposal to lay an additional tax on freeholds was rejected as impracticable, on the ground that the only proper subject of valuation is the ground with the house upon it. The division of rates between landlord and occupier would, in the case of compound householders and of tenants for short terms, be only an apparent advantage to the occupier, and the committee were, of course, averse to any interference with existing contracts. As to the proposal to rate building land, it was not always easy to say when land was ripe for building, and it might be left to the intelligence and self-interest of owners to so manage their property as to get the maximum of income from it, which income was itself taxed.

The President strongly urged upon the Government the necessity of some more stringent provisions for the inspection and control of the building societies, and of a regulation which should compel them to employ a competent person to value the property, which was the security for the depositors' money. The Council of the Institution had, in common with other bodies interested in the laws relating to building in the Metropolis, considered the proposals of the Local Government Board for a codification of the existing Building Acts, and had, after careful consideration, been able to recommend several important modifications of the Government Draft Bill.

The next portion of the address dwelt in an able manner with the suggestions and proposals of the London County Council for the new street which was to connect North and South London. After setting forth the objects which such a street should endeavour to accomplish, the President somewhat severely criticised the position assigned to the Strand end of the great thoroughfare, even as modified in the County Council's latest proposals. It would, he said, concentrate in the least suitable part of the Strand the immense traffic which now found its way by a multitude of routes, and would render the confusion and inconvenience worse, if possible, than it is at present. As an alternative scheme he proposed a street from the Embankment end straight to the western side of Lincoln's Inn-fields, thence trending north-westward to the north end of Little Queen-street, Holborn. This street would run on a level from the Embankment to the Strand, at a depth of some 23 ft. below that thoroughfare, which would cross it by means of a viaduct, and thence for some 1,300 ft. at an easy gradient to Lincoln's Inn-fields, with a spur street on the site of Clare-street, Blackmore-street, and White Hart-street for the Waterloo Bridge traffic. The streets crossed or interfered with were unimportant, and the area one much requiring to be opened up. The idea certainly seems a feasible one, and one which should recommend itself to the very careful consideration of the County Council.

The President next dealt with the Cromwell-road scheme, and the novel fiscal proposals embodied in the Bill for authorising it. Why, he said, should the owner be called upon to pay one-half of the supposed improved value of his premises? Why not all, if the improvement

arose from the action of the County Council alone? He suggested that a clause should empower any owner who wished to do so to sell his property compulsorily to the County Council, who would thus reap the whole instead of a moiety of the improved value. He ridiculed the provision by which the owner was prohibited from contracting himself out of his liabilities. How was this to be done at the end of a lease, unless ground values could be fixed, once and for all; and would the position of the leaseholder be a happy one who found himself, on wishing to renew his lease, with a fresh burden on his shoulders? The proposals were impracticable, and in that they tended to disturb the security of income from land, on which so many small capitalists depended, they were also mischievous.

The new plan for doing away with a "middle-man," in the shape of a contractor, was next touched on, and the speaker pointed out that the contractor had been evolved and continued to exist simply because clients, both public and private, found that the system paid them to adopt. There was never anything to prevent an owner from dispensing with the contractor's services, but the accumulated experience of years had convinced everyone that he performed useful functions, and he had therefore been employed.

Under the new proposals, who was to be responsible for bad work? The individual workmen, or the County Council, as the rate-payers' middleman, responsible pecuniarily to no one? The address then dealt with the strides made in the direction of sanitary science, and especially with the Plumbers' Registration Bill, and, at greater length than our space permits us to quote in full, with the London Water Question.

The Small Holdings Acts and their operation, the depression of agriculture, the redemption of tithe-rent charge, and the movement for technical and secondary education were all treated of in an exhaustive manner, and the address closed with a suitable reference to the great success of the system of examinations founded some ten years ago by the Institution, and since immensely extended.

Sir R. E. Webster, Q.C., M.P. (associate of council), having moved a vote of thanks to Mr. Shoppee for his address, and the motion having been seconded by Mr. R. C. Driver (past-president), and carried unanimously, the meeting adjourned.

CHIPS.

The Torrington Town Council have elected as mayor Mr. Councillor Grant. He is a large employer of labour. Starting life as a carpenter, he is now one of the largest builders and principal houseowners in the district.

The London County Council have appointed Mr. J. J. Sexby as chief officer of the Parks and Open Spaces sub-department, at a salary of £500 a year.

The Almondsbury Hospital and Institute, erected by Mr. Sholto V. Hare as a memorial to his late wife, was opened on Wednesday by the Duchess of Rutland. The building is L shaped on plan, and modernised Queen Anne in style, and is built of Cattybrook brick, with freestone facings. The main entrance is under the clock tower, and leads into a vestibule, from which access is gained to the parish room, the dispensary, the coffee bar, the domestic offices, and the main staircase. On the first floor are a large hall, six bedrooms, and a committee-room.

The proposal of the Head Master of Winchester College to build a new chapel in celebration of the five hundredth anniversary of the founding of the school in 1393 having been conclusively negatived by the Old Wykehamists, it has now been decided to reset the old chapel and to erect in it a western gallery. The architect is Mr. J. T. Micklethwaite, F.S.A.

The Burton-on-Trent town council have decided to apply for permission to borrow £11,500 for the erection of an infectious diseases hospital, and £80,000 in respect of the sewerage and electric-light schemes.

A new organ, built by Messrs. Abbott and Smith, of Leeds, was opened on Sunday at Meanwood Church, near Leeds. It is built on a new system of electric control, and can be played from any position in the church. It contains 30 stops and 1,400 pipes, and is placed in an oak case with polished pipes.

Mr. Passmore Edwards has, says the London correspondent of the *Manchester Guardian*, intimated his willingness to give £1,000 for the purpose of erecting a drinking fountain as a memorial of Mr. James Beal and Mr. J. F. B. Firth, the pioneers of London municipal reform.

CONTENTS.

"The Council Broadway,"	691
Division of Buildings	692
"What have We to do with the Beauty of London?"	692
The Society of Architects	694
Theatres.—XII.	695
Iron Arches of Large Span.—IV.	697
Carpentry and Joinery.—XLVI.	698
Bricks and Joints in Brickwork.—II.	699
The Surveyors' Institution	700
The Building News Directory	xi.
Our Illustrations	701
Way-side Notes	720
American Architects on Competitions	720
Prices.—LI.	721
Obituary	721
Engineering Notes	722
Architectural and Archaeological Societies	722
Building Intelligence	722
Competitions	723
Correspondence	724
Intercommunication	724
Legal	724
Legal Intelligence	724
Water Supply and Sanitary Matters	726
Our Office Table	726
Meetings for the Ensuing Week	726
Trade News	727
Tenders	728

ILLUSTRATIONS.

ST. GEORGE'S, HANOVER-SQUARE, PUBLIC LIBRARY.—
PAVILION AT READING.—TECHNICAL SCHOOLS, PORT
TALBOT.—A CANADIAN SUMMER COTTAGE.—BILLIARD
ROOM, "FOXOAK," SURREY.—SOUTHDOWN SUSSEX
SKETCHES.—GLOUCESTER MANSIONS, CAMBRIDGE-CIRCUS.
—EAST END, NICHOLASTON CHURCH, GLAMORGAN—MANOR
OF ASTON PUBLIC BATHS.

Our Illustrations.

ST. GEORGE, HANOVER SQUARE, PUBLIC LIBRARY.

THIS design was recently selected in a limited competition, and the building is now in course of erection in the Buckingham Palace-road, on a site presented to the parish by his Grace the Duke of Westminster. As will be seen from the plan streets on both frontages exist, and on both sides there are buildings which preclude the possibility of obtaining light by windows on either side. The requirements being that all the principal rooms should be on the ground floor the course adopted was to occupy the whole area, and provide top lights to some of the rooms in lieu of providing areas for light, which, as a rule, are of little service unless they are of sufficient size to allow the admission of the rays of sunlight at about 45°. Another requirement was the economical supervision of the staff by the librarian. This was solved by placing the librarian's office in the centre of the building, with the various offices grouped around, thereby giving easy supervision of the several departments, as well as the entrance hall, staircase, and exits. On the first floor (over the front portion only) is a museum and board-room, and the librarian's residence is above, on the second floor, with separate entrance from the Buckingham Palace-road. The façade next the Buckingham Palace-road is to be executed in red gauged brickwork, with Ketton stone dressings. The general contractor for the work is Mr. J. T. Chappell. The architect of the building is Mr. Albert John Bolton, and the drawing from which the illustration is taken was exhibited in the Royal Academy this year.

PAVILION, PALMER PARK, READING.

OUR illustration of the Pavilion, Palmer Park, Reading, is taken from the little view of this building which was exhibited at the Royal Academy during the present year. It forms part of the munificent gift of Mr. George Palmer to the Borough of Reading, known as Palmer Park, and, as will be seen by the plan accompanying the sketch, consists of caretaker's house, refreshment rooms, &c., and conveniences for ladies and gentlemen. The whole of these are well furnished and fitted, and in every trade the work is of the best, all the timber work being of solid oak. Mr. Margetts, of Reading, is the contractor for the building, which was designed by Mr. Ravenscroft, of the same town.

INTERMEDIATE AND TECHNICAL SCHOOL, PORT
TALBOT, GLAMORGANSHIRE.

THIS design was submitted in a recent competition which created a considerable amount of discussion locally. A number of these schools are now being built, or contemplated, under the

Welsh Intermediate Education Act. The building is designed to accord with the desire expressed for a mullioned style, and for realisation in the exceptionally fine-toned local sandstone. The author is Mr. W. L. Griffiths, architect.

A CANADIAN SUMMER COTTAGE.

THE design of this cottage was submitted originally in one of the Toronto Architectural Sketch Club's monthly competitions in 1890. The cottage is to have stone foundations, to be timber-framed, boarded outside, and shingled with white pine shingles left untouched to turn green with exposure to weather. The house is to be lathed and plastered inside. The internal finishings are of white pine varnished. The spacious verandahs are to be noted as being a necessity in the bright sunlight of Canadian summer. Mr. Ernest Wilby, of Temple-avenue, is the architect.

BILLIARD ROOM, FOXOAK, BURHILL, SURREY.

THIS additional room to the house (which we have already illustrated in the BUILDING NEWS for April 22, 1887), was finished soon after last Easter. Messrs. Walter Holt and Son, of Croydon, were the builders. The floor and ceiling-beams are oak, stained green, and the intention is to lessen the prominence of the ungraded green of the billiard table cloth by floating it into the surrounding green of the curtains, ceiling, and tiles. The room, when finally complete, will be a green and gold room—the walls to have a gold paper, and the plaster of the ceiling treated with gold. The tiles to the curved recess are from Messrs. De Morgan and Co., with a fine sea-piece (also in tiles) over the fireplace. The mantelshelf, &c., is of statuary marble. Mr. Hal'sey Ricardo is the architect.

SOUTHDOWN SUSSEX SKETCHES.

LEOMINSTER (*vulgo* "Limster"), near Arundel, in ancient times known as Lolinminster, and sometimes Nonnemister, is now a very unimportant place. To the architect the chief point of interest in the church now consists in the very unusual timber framings which occur in the aisle on the north side of the nave, and are placed against each of the four columns of the arcade. Whether they actually formed part of the original roof or not may be open to question, but it is clear that they are ancient, and for some reason not very evident were designed to carry the roof independent of the arches dividing the aisle off from the main building. The accompanying sketches show both inside and outside of the church, with its long uninterrupted breadth of roof in one slope. The interior view is taken half-way up the nave, in front of the porch door, which is on the north side. At the east end of the aisle is placed the font in a sort of baptistery chapel, beyond which is the priest's door leading into the *quasi* aisle opening into the vestry, which looks outside somewhat like a choir transept. *Wiston Place*.—This house, near Steyning, was erected in the days of Elizabeth by Sir Thomas Sherley, one of the honourable line of Sherley of Wiston, "a family not needing hyperboles." The mansion, like Hardwick Hall, is open to the description of being more glass than wall, particularly on the entrance front. It possesses a very handsome hall, a cube of 40ft., and is covered with an open timber roof. Over the screen at the entrance end of the hall is a gallery leading into the room over the porch, and the big windows seen in our sketch run up the whole height. The residence has been reduced in size, but is still rightly reckoned among the mansions of Sussex, which is not rich in big old houses. The dining-room retains much of the ancient oak carving, dated 1576. *Hurstmonceux Castle*.—The last of the four sketches shows Sir Roger de Wyne's costly castle near Eastbourne, which is one of the earliest brick buildings in England, and when in its complete state was one of the largest private houses in the kingdom. It cost no less than £3,300, which in 1440, the date of its erection, was a very large amount. It is a grand old house even in its ruined condition, with a splendid old garden at the rear. It is surrounded by a moat, now dry, and is quadrangular in form, and has a striking gatehouse.

GLOUCESTER MANSIONS, CAMBRIDGE CIRCUS, W.

THIS building stands on a prominent corner site, facing the new English Opera House, and is so constructed that the ground floor and basement can be let for business purposes as a whole or divided, and the other floors consist each of two self-contained residential flats, which are clearly

shown on the plan attached. There are hydraulic passenger elevators to all floors. The elevation is in Bath stone and red bricks, and the work was carried out under the superintendence and from the designs of the architects, Messrs. Martin and Purchase, of 11, Queen Victoria-street, E.C.

NICHOLASTON PARISH CHURCH, GLAMORGANSHIRE.

THIS illustration represents the east end and reredos of the above church. The reredos is executed in pink alabaster, with pale Irish green marble columns. The figures are carved in white lias, with gold mosaic background. The inner arch and jambs of the east window will also be in alabaster, with Irish green marble shafts. The north and south chancel windows will be executed in similar materials, and the rest of the church windows in green Bridgend stone, with marble columns. The steps leading to the altar are of polished white statuary, Brèche sanguinaire and Belgian black marble consecutively. The entire church will be paved with black and white marble. The work is being executed by Mr. W. Clarke, sculptor, Llandaff, from the designs and under the superintendence of Messrs. Halliday and Anderson, architects, of Cardiff and Llandaff. The choir angel cornice was illustrated by us on April 15, 1892.

PUBLIC BATHS, ASTON.

THE water for supplying these baths is obtained from an artesian well 400ft. deep on the premises. The pumping engine is also utilised for supplying power to generate the electricity with which the whole of the baths are lighted; also a cable is laid to the public buildings and offices, half a mile distant, and these are lighted by electricity from the same source, gas being entirely dispensed with. The water is heated by live steam, supplied from a Lancashire steam boiler, 24ft. long by 7ft. diameter. A duplicate boiler is also provided. The water can be readily heated to 75°. Had the water been heated by the ordinary hot water circulating system, it would have taken five boilers to do the work which is now being done by one. Provision has also been made for the boilers to be readily removed and taken out at any time without materially interfering with anything. The electrical installation is a decided success, and cost £1,600; the cost of the baths, buildings, and engineering is £13,400; total cost, £15,000. Mr. W. A. Davies, Assoc. M. Inst. C.E., the surveyor to the board, is the architect of the work, the plan of which is herewith given.

CHIPS.

The local board of Hampton Wick have raised the salary of Mr. Kemp, their surveyor, from £175 to £200 a year.

The parishioners of Byfleet have just erected a lych-gate as a memorial of the late Rev. Newton John Spicer, who was rector from 1851 to 1884. The lych-gate was designed by Mr. Woodyer, of Grafton.

The tender of Messrs. Reed, Blight, and Co., contractors, Westminster, has been accepted by the Directors of the Clacton-on-Sea Pier and Pavilion Co. for the erection of the new pavilion and sundry other works at their pier. The engineers are Messrs. Kinnipie and Jaffrey, M.M.I.C.E., 3, Victoria-street, London, S.W.

Mr. William Joseph Shayer, the landscape and animal painter, who died at Twickenham last week, aged 81, was the eldest son of Shayer, a better-known landscape painter, whose rural and seaside scenes are highly prized, and who died only a few years ago in his 100th year. The younger Shayer made his reputation by his sporting pictures—hunting, shooting, racing, fishing, and coaching.

Two landscapes, attributed to John Constable, R.A., which have been presented to the Liverpool permanent collection by Mr. Malcolm Guthrie, have been placed in the Rossetti room of the Walker Art Gallery. The first, measuring 5ft. by 3ft., represents "A Summer Storm." The lock gates of a river—probably the Stour—are shown, while overhead are large, gusty rain clouds. On the left of the picture are two canal horses and a labourer. The second canvas portrays "A Rainy Day." Lock gates are also a prominent feature in the landscape, while overhead are rain-clouds, and in the distance trees are seen through the haze.

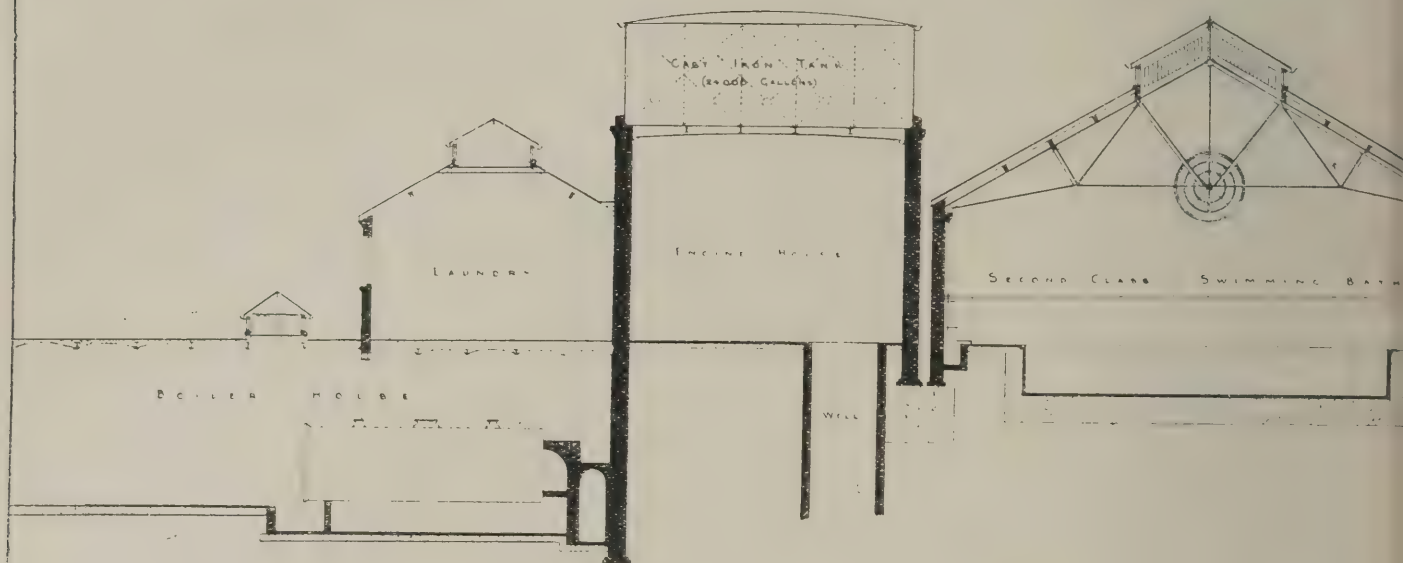
The latest addition to the National Gallery is a fruit and flower piece by Jan Van Os (1744-1808). It is numbered 1380, and is hung in the Octagon Room. Another work by the same artist, called "Fruit, Flowers, and Dead Birds," is in the Wynn-Ellis collection, and is numbered 1015.

MANOR OF ASTON

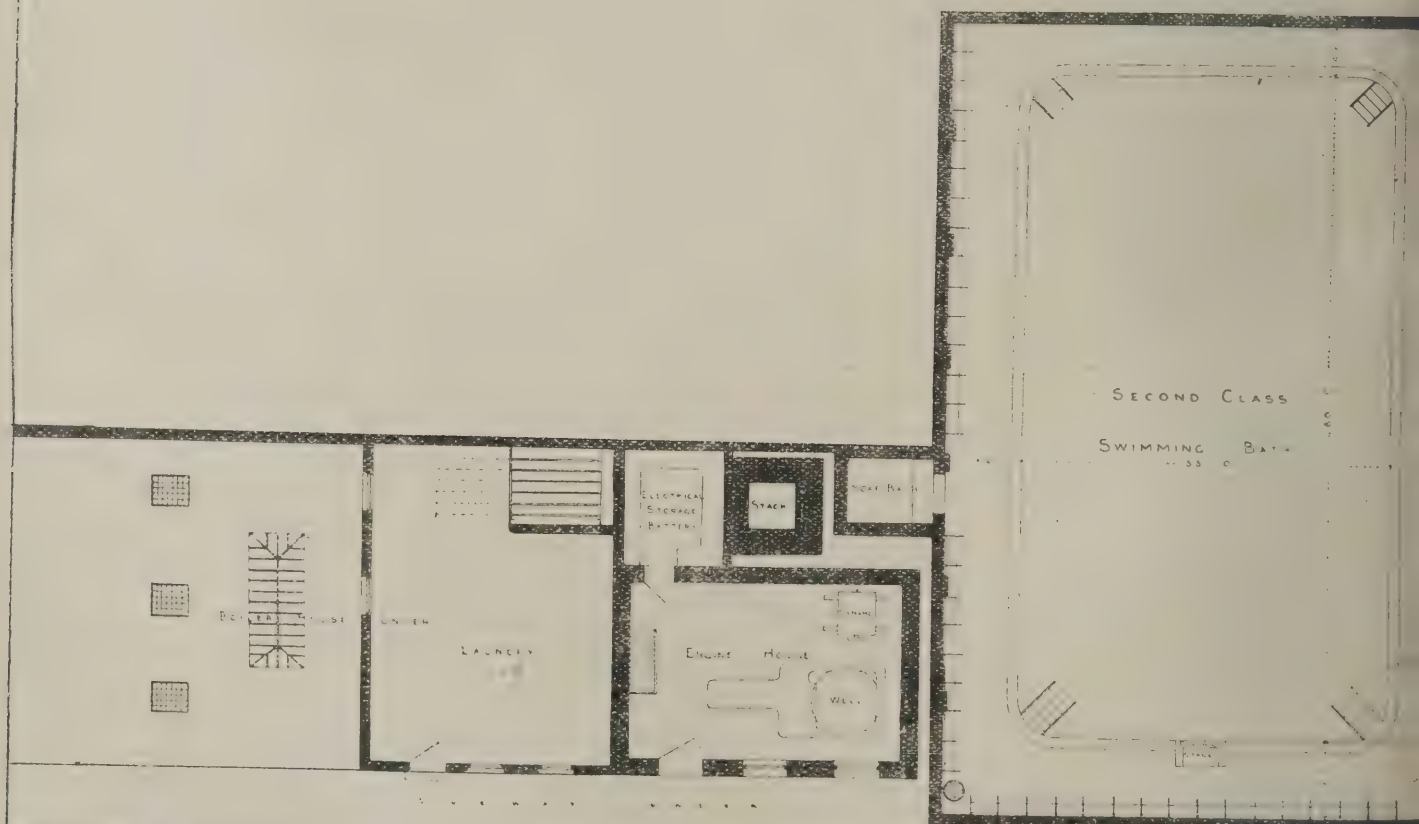
PUBLIC BATHS

W A DAVIES A MICE

ENGINEER AND SURVEYOR TO THE BOARD



LONGITUDINAL SECTION

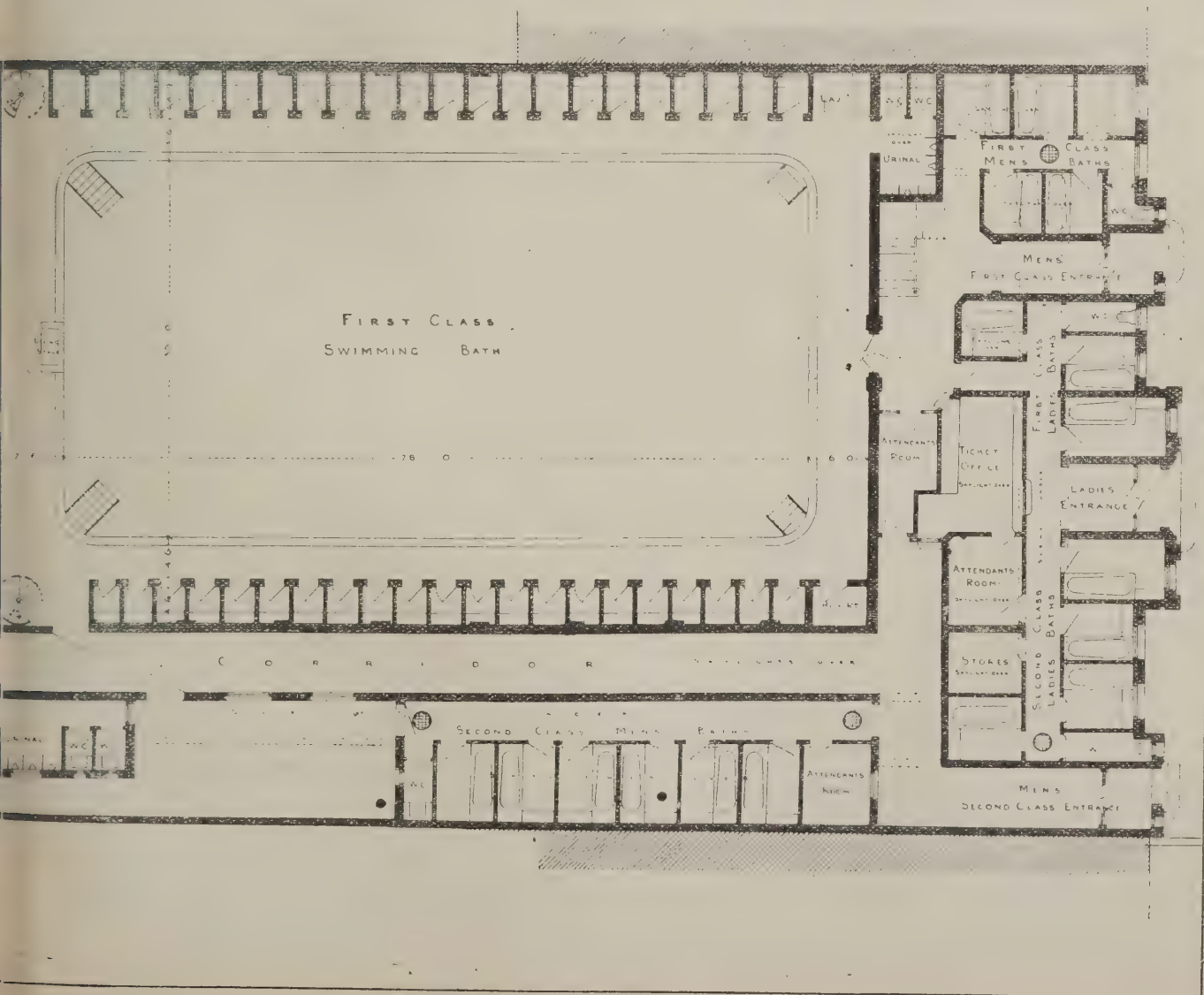
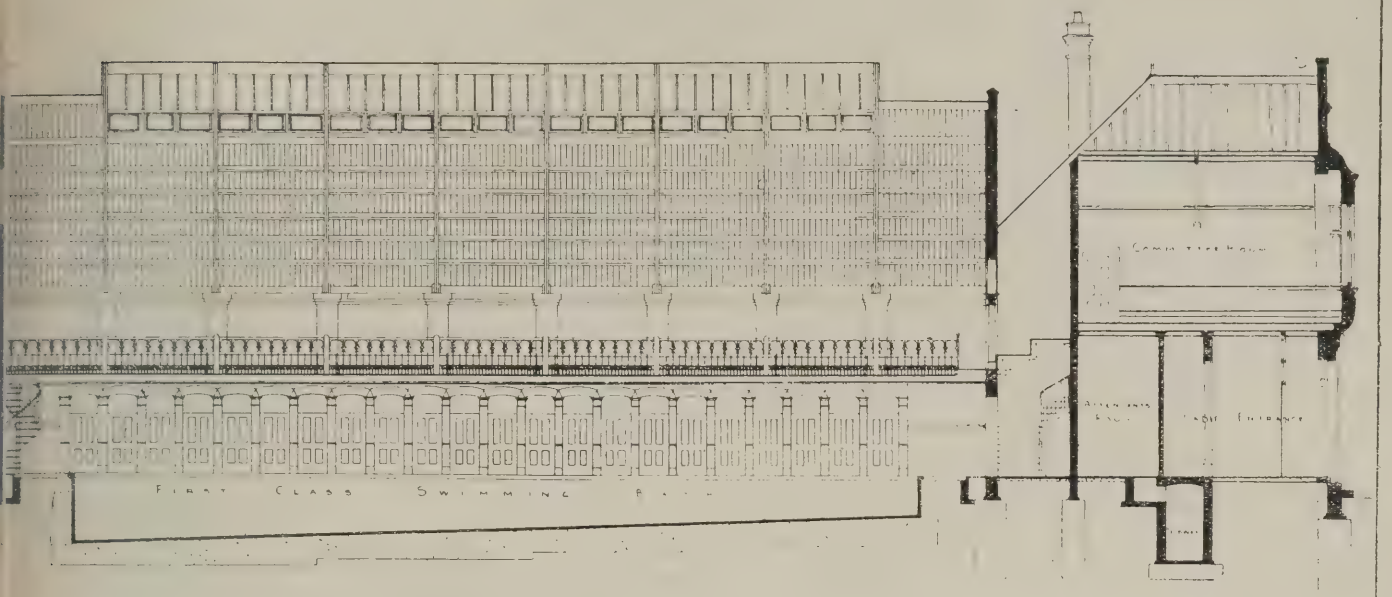


GROUND PLAN



ENGINEER SE

S, Nov. 18, 1892.



WAYSIDE NOTES.

MR. ROBERT WALKER'S presidential address to the Society of Architects was completely successful. Excellent was the reiteration of the necessity for more thorough architectural education; inspiring, the picturesque allusions to the poetry of architecture; while the telling broadsides against super-sentimentalism displayed many weak points in the battalion of Essays. Mr. Walker makes a most admirable president.

The hearty laughter that greeted these sorties formed a most agreeable prelude to the capital dinner in the evening at the Holborn Restaurant, when, covers being laid for some sixty guests, officers, members, and friends had a thoroughly convivial time under Mr. Walker's genial presidency. The post-prandial, oratorical deliverances were of a high order. Mr. Atherley-Jones, M.P., who has the Registration Bill in his care in the House of Commons, gave proofs of his devotion to the cause in his own clear-headed, far-seeing manner; and Mr. Wyke Bayliss, F.S.A., in responding to the toast of "The Fine Arts," spoke of the relations between painter and architect in his usual earnest, inspiring style. I listened with much interest to the remarks of Sir William Marling, his views of the requirements of modern architecture from a client's standpoint strengthening my old belief that it is to the outside critic, and not to the professional, running in grooves and ruts, that we must look for knight-errants against dogged conservatism in ways and means.

There is, I believe, a prosperous season before the Society of Architects. Its aims, as heretofore, will be distinctly practical; and its lectures, as heretofore, confessedly dealing with architecture as a living progressive art. While the Society continues in this path, it cannot but go forward, both in intrinsic merit and in numbers; for all architects recognise the desirability of keeping architecture abreast of the times, and in the long run will support such institutions as assist this end.

I am very glad to see that Mr. Tate has, through Sir William Harcourt, the present Chancellor of the Exchequer, renewed his generous offer to the nation. It is believed that the offer will be accepted within the next few weeks, and that the difficulty of site has been almost surmounted, Westminster being the probable location of the pictures. This is excellent news, and if the present Government carry the matter through well, it will have done much to earn the respect of not an insignificant section of the public, who will make comparisons between its action and that of its predecessors.

"Tower or no tower?" that was the question. What must have been one of the most diverting discussions at the meetings of the School Board took place on Thursday last; a proposal having been made to erect a tower in connection with the extension of offices now approaching completion, members more or less vigorously declaring for or against the structure. The argument being that the offices as extended form, altogether, a rather drawn-out architectural composition, a central, dominant object was required "to give unity to the building," as the Rev. J. J. Coxhead very truly remarked—if we accept his position on general principles. The estimated cost of the tower is £3,000, and many members, like Mr. Winnett, were "filled with awe at the effect that this tower would have upon the rate-payers." Others, like Canon Bristow, regarded the expenditure as equivalent to "a ha'porth of tar." Some, like genial Mr. John Lobb, were all for the tower; others held with Mr. Huggett, that a tower and a rate of one shilling in the pound were not things of accord. If I may put forward my own idea, it is that the tower would be useless artistically, and only worth its salt as regards the practical accommodation it might afford. Close to the building the tower would not be seen, or at least be of little or no value as a factor in the composition; and when we see these Embankment buildings at a distance there is quite a galaxy of towers, spires, and turrets breaking the general sky-line, and giving themselves away, so to speak, for the benefit of such forlorn buildings as have no towers of their own. In any case, I pray that the Board save us the infliction of another clock in the neighbourhood!

The £3,000 therefore, might well be kept for general educational purposes, and not for illustrations of architectural design. A little of the money might be expended on making some of the schools—being necessary buildings—more presentable. I see a new building near the railway somewhere this side of New Cross, and it is a barbarous object. As I note the magic initials L.S.B. lovingly entwined in a gable, I may be pardoned if I am in error in imagining it to have been erected by the Board.

The St. Pancras competition will attract a large number of competitors. Municipal buildings being a favourite subject, and requiring less previous study and special experience than others, the rank and file of the army of competing architects will enter the arena; and as no entrance fee is demanded, the hard-working and clever, but poor, student has here a decided opportunity to show what in him lies in the way of ability in architectural composition and sound planning. I see that the first premium is arranged on the "merging" principle, which, as Mr. William Young said the other evening in his lecture to the Association, and as I have all along urged, makes it no premium at all. In this particular case it is exceptionally desirable that the successful architect should receive something a little over the 5 per cent. commission. Besides the risk and uncertainty that attends every competition, I see that the inaugurators of this competition stipulate that if a tender is not obtained within 5 per cent. of the sum of £30,000—a sum including, in a very objectionable way, the architect's commission—they will not be liable to the architect for any of his time and trouble in preparing plans, &c., and obtaining a tender. Here we see how the honest have often to suffer for the misdeeds of the unscrupulous. The object of this stipulation is, of course, to prevent dishonest persons endeavouring to gain the competition by submitting designs that will cost more than the amount provided. So far, so good; but it is hard that those who would endeavour honestly to provide a building should have this additional incubus, and by mere accident or oversight run the risk of doing a vast amount of work for nothing. Still, most probably the bulk of competitors will agree that the stipulation as it stands is good, and that the benefits far outweigh the disadvantages. As to the merging of the first premium, this is a meanness scarcely worthy of a large and important London vestry.

How irrepressible is the old Adam in this matter of stipulated cost may be gathered from the curious result of the Bexhill-on-Sea competition. Here all the competitors but two have "outrun the constable," and these two have failed to comply with other conditions. The assessor has recommended the Bexhill local board to increase the proposed outlay from £3,300 to £4,500, and inquired of the competitors whether they will stand their chance with their original design, or prepare an alternative set of plans. If there be another competition, I should advise all not to rest on their oars, but to see how they can improve their designs. We know how a competitor will get it into his head that his design is unimprovable perfection itself; but a word to the wise may be heeded. Of course, a proper and sufficient time should be allowed for the new designs.

From a recent very interesting article in the *Daily Telegraph* on "The Value of City Property," I learn that "some speculators, in their anxiety to make the land carry as heavy a financial load as possible, have been so 'greedy'—to borrow the term used by one agent—as to erect buildings which will not let freely at high rents, simply because the architect has cramped the passages, and robbed the rooms of light and air." This, from observation, I can quite believe. In planning such buildings, the owner and architect should ascertain the amount of accommodation that will give a fair, perhaps good, return on the money invested. To try and squeeze every pound out of the venture is a despicable variety of "sweating," and any so doing only meet their just deserts when they put on the last straw and break the camel's back.

"Granny's" in the grumps again. A back seat is always hard, I suppose, and particularly

so to old bones. The old lady was heard all over the shop last week, crooning to herself:—

"All behind, my dears, and we
Scarce excuse can stammer. Ah!
They got in front of us, you see—
Them willins—with a camera!"

GOTH.

AMERICAN ARCHITECTS ON COMPETITIONS.

AT the annual convention of the American Institute of Architects, held at Chicago on October 20, the following series of pronouncements and suggestions to promoters and architects on the management of competitions, drawn up by Mr. Charles E. Ilsley, the chairman of the Competitions Committee, was unanimously adopted, and ordered to be printed for gratuitous distribution to members:—

While the American Institute of Architects emphatically disapproves of architectural competitions as usually conducted, long experience having shown that they result almost invariably in disappointment and harm to all interests concerned, to the public as well as to the profession, and to owners equally with architects; and while the Institute advises that wherever practicable an architect should be selected individually in the same manner as with lawyers, physicians, and other professional men; still, where on Government work for any reason an architectural competition is unavoidable, the following precautions are suggested to both owners and architects as calculated to obviate the principal causes of miscarriage, and to enlist the co-operation of architects who will otherwise be likely to refuse participation in the competition.

1. An experienced architect of repute should be engaged by the owners at the start as consulting architect throughout the competition. All the papers and correspondence should be controlled by him. Of course, he will not participate as a competitor.

2. The rules and restrictions should be as few as possible, and so explicitly stated as to prevent misunderstanding.

3. Two kinds of competitions are customary—viz., an open and a limited competition. In the latter a certain number of architects are invited to submit designs, and all others are excluded. In the former the competition is open to every one. An open competition is often preliminary to a limited competition confined to those architects (usually three to six in number) whose designs received in the open competition have been placed highest.

4. Every invited architect should be paid for his competitive design the schedule commission of one per cent. on the estimated cost of the building. The architect whose design is placed highest should be guaranteed the work at the schedule fee of five per cent. for plans and superintendence. Unsuccessful designs should be returned free to their author immediately after the award is made; no portion of them to be used without the consent of their authors.

5. The site of the building should be given and the requirements as to accommodation, cost, &c. It might be well to arrange the requirements in two classes—viz., those which are arbitrary and must rigidly be adhered to, and those which are advisory only. As a rule, owners will find their interests promoted by making the list of arbitrary conditions as small as possible.

6. All transactions relating to the competition should be in writing, and recorded, and open to the inspection of each competitor.

7. A date should be fixed within which the awards should be announced and all premiums paid.

8. After the award all drawings should be open to the inspection of all competitors for at least 24 hours. In many cases an exhibition open to the public would be desirable.

9. The selection and premiation of the designs should be made by a jury, of which at least two-thirds should be disinterested and experienced architects, whose report should be in writing and accessible to each competing architect.

An hotel is about to be built at Stone Point, Fawley, Hants, from plans by Mr. Stanfield C. Greenwood, of Southampton, at an estimated cost of £4,000.

The highest chimney in Germany, and probably on the Continent, has just been built at Stolberg, near Aix-la-Chapelle. It is 407ft. high, and it stands, moreover, on an eminence which rises some 270ft. above the surrounding plain. The inside diameter of the stalk is, at the bottom, 16ft. 8in.; at the top nearly 10ft. The chimney, provision for ascent of which has been made by fixing iron steps in the masonry, has occupied six months in erection, and the work was carried out without accident.

At the last meeting of the local board for Erith, a letter was received from Mr. W. W. Cooper, of Hinxley, the newly appointed surveyor, stating his regret at having to decline the appointment at that late hour, his local board having pressed him to stay. It was decided not to proceed against Mr. Cooper, but the Board considered they had been very shabbily treated. The chairman said it was necessary to fill up the vacancy, and he submitted the name of Mr. Harold Hind, son of a member of the board, who would be just the man to take up the duties. Mr. Hind did not come forward in competition before because he had no prior experience! He proposed that Mr. Hind should be appointed on trial for six months, and then the berth could be thrown open to public competition. This was agreed to.

PRICES.*—LI.

(All Trade Discounts have been taken off, and Profit added.)

IRONMONGER, & Co. (continued).

SAFES, LISTS, & Co. (Chubb's, delivered only).

BURGLAR and fireproof doors and frames—		£	s.	d.
5ft. 9in. by 2ft. 3in. outside of frames (not the horns)	each	19	0	0
6ft. 0in. by 2ft. 4in. ditto	ditto	22	0	0
6ft. 2in. by 2ft. 6in. ditto	ditto	26	15	0
plates 5 thick	ditto	30	0	0
6ft. 2in. by 2ft. 8in. ditto	ditto	29	0	0
6ft. 6in. by 2ft. 6in. ditto	ditto	37	0	0
6ft. 6in. by 3ft. 0in. ditto	ditto	42	10	0
6ft. 9in. by 3ft. 4in. ditto	ditto	2	0	0
Additional and different key-locks	ditto	3	10	0
Combination keyless lock	ditto			

BANKERS' HARD steel-plated doors—
 6ft. 2in. by 2ft. 6in. outside frames ditto 52 0 0
 6ft. 2in. by 2ft. 8in. ditto 58 0 0
 6ft. 6in. by 2ft. 6in. ditto 56 0 0
 6ft. 6in. by 3ft. 0in. ditto 68 0 0
 6ft. 9in. by 3ft. 4in. ditto 78 0 0

(These are made of 1½ plate, and with wheel locks, 12 bolts all round, and cheek lock.)
 Extra for night bolt ditto 6 0 0

WROUGHT-IRON Grilles—		£	s.	d.
5ft. 9in. by 2ft. 3in. 3in. to 1in. round iron bars and heavy iron frames (Chubb's lock)	ditto	12	0	0
6ft. 0in. by 2ft. 4in. ditto	ditto	13	0	0
6ft. 2in. by 2ft. 6in. ditto	ditto	14	0	0
6ft. 2in. by 2ft. 8in. ditto	ditto	15	10	0
6ft. 6in. by 2ft. 6in. ditto	ditto	15	0	0
6ft. 6in. by 3ft. 0in. ditto	ditto	19	0	0
6ft. 9in. by 3ft. 4in. ditto	ditto	22	0	0
Price of connecting plates for walls up to 18in. thick	ditto	8	10	0

COMBINED door and grille, with connecting plates for walls up to 18in. thick—		£	s.	d.
5ft. 9in. by 2ft. 3in. ordinary quality	ditto	38	0	0
6ft. 0in. by 2ft. 4in. ditto	ditto	42	0	0
6ft. 2in. by 2ft. 6in. ditto	ditto	48	0	0
6ft. 2in. by 2ft. 8in. ditto	ditto	53	0	0
6ft. 6in. by 2ft. 6in. ditto	ditto	51	0	0
6ft. 6in. by 3ft. 0in. ditto	ditto	63	10	0
6ft. 9in. by 3ft. 4in. ditto	ditto	72	0	0
6ft. 2in. by 2ft. 6in. bankers' quality	ditto	74	0	0
6ft. 2in. by 2ft. 8in. ditto	ditto	82	0	0
6ft. 6in. by 2ft. 6in. ditto	ditto	79	0	0
6ft. 6in. by 3ft. 0in. ditto	ditto	94	0	0
6ft. 9in. by 3ft. 4in. ditto	ditto	106	0	0
6ft. 9in. by 4ft. 9in. ditto	ditto			

CHATTWOOD'S Safes, & Co.—		£	s.	d.
22 by 16 by 18 single door safe	ditto	7	15	0
24 by 18 by 18 ditto	ditto	9	15	0
26 by 20 by 20 ditto	ditto	12	5	0
28 by 22 by 22 ditto	ditto	13	10	0
30 by 24 by 24 ditto	ditto	16	10	0
33 by 26 by 24 ditto	ditto	18	15	0
36 by 28 by 24 ditto	ditto	21	0	0
42 by 26 by 24 ditto	ditto	23	10	0
48 by 28 by 26 ditto	ditto	28	10	0
54 by 30 by 26 ditto	ditto	31	0	0
60 by 30 by 24 double door safe	ditto	23	10	0
38 by 36 by 28 ditto	ditto	32	0	0
48 by 38 by 28 ditto	ditto	44	0	0
54 by 40 by 30 ditto	ditto	49	0	0
60 by 48 by 30 ditto	ditto	60	0	0
66 by 54 by 30 ditto	ditto	69	0	0
72 by 60 by 30 ditto	ditto	79	10	0
24 by 18 by 18 fire, fall, and burglar proof	ditto	14	15	0
26 by 20 by 20 ditto	ditto	18	0	0
28 by 22 by 20 ditto	ditto	21	15	0
30 by 24 by 24 ditto	ditto	25	10	0
33 by 26 by 24 ditto	ditto	28	17	0
36 by 28 by 24 ditto	ditto	32	10	0
42 by 26 by 24 ditto	ditto	36	0	0
48 by 28 by 26 ditto	ditto	42	0	0
54 by 30 by 26 ditto	ditto	47	10	0
60 by 30 by 26 ditto	ditto	52	0	0
60 by 33 by 23 ditto	ditto	57	0	0
30 by 30 by 24 double doors	ditto	35	0	0
38 by 36 by 28 ditto	ditto	43	10	0
48 by 38 by 28 ditto	ditto	66	0	0
54 by 40 by 30 ditto	ditto	75	0	0
60 by 48 by 30 ditto	ditto	91	0	0
66 by 54 by 30 ditto	ditto	106	0	0
72 by 60 by 30 ditto	ditto	119	0	0

PRICES OF FITTINGS—		£	s.	d.
One drawer up to 10in. wide	ditto	1	7	6
Two ditto 10in. to 18in.	ditto	1	13	0
Two ditto 18in. to 24in.	ditto	1	18	6
Two ditto in width up to 18in. total	ditto			
width of pair	per pair	2	4	0
Two ditto from 18in. to 24in.	ditto	2	10	0
Two ditto from 24in. to 36in.	ditto	2	15	0
Two ditto above 36in.	ditto	3	6	0

Drawers above 6in. high, extra.		£	s.	d.
Single door cupboard same price as pair of drawers.				
Double ditto 50 per cent. more.				
Shelves, 11s. per foot in width.				
Partitions, 11s. per foot in height.				
Fractions charged as a foot.				

No. 44 EXTRA QUALITY (straight bolt)—		£	s.	d.
24 by 18 by 18 without fittings	each	52	15	0
26 by 20 by 20 ditto	ditto	26	0	0
28 by 22 by 22 ditto	ditto	33	0	0
30 by 24 by 24 ditto	ditto	38	10	0
33 by 26 by 24 ditto	ditto	44	0	0
36 by 28 by 24 ditto	ditto	47	0	0
42 by 26 by 24 ditto	ditto	52	10	0
48 by 28 by 26 ditto	ditto	63	10	0
54 by 30 by 26 ditto	ditto	72	10	0
60 by 30 by 26 ditto	ditto	79	10	0
60 by 33 by 28 ditto	ditto	87	0	0

No. 5 SAFES, with claw bolts—		£	s.	d.
24 by 18 by 18, no fittings	ditto	27	0	0
26 by 20 by 20 ditto	ditto	31	10	0
28 by 22 by 22 ditto	ditto	40	0	0
30 by 24 by 24 ditto	ditto	46	0	0
33 by 26 by 24 ditto	ditto	52	10	0
36 by 28 by 24 ditto	ditto	56	0	0
42 by 28 by 26 ditto	ditto	63	0	0
48 by 30 by 26 ditto	ditto	76	0	0
54 by 30 by 26 ditto	ditto	87	10	0
60 by 33 by 28 ditto	ditto	96	0	0
36 by 36 by 28 double doors, no fittings	ditto	103	10	0
48 by 38 by 28 ditto	ditto	86	0	0
54 by 40 by 30 ditto	ditto	111	0	0
60 by 48 by 30 ditto	ditto	129	0	0
66 by 54 by 30 ditto	ditto	157	0	0
72 by 60 by 30 ditto	ditto	193	0	0
72 by 60 by 30 ditto	ditto	210	0	0

COMPOUND STEEL, with parallel bolts front and back—		£	s.	d.
30 by 24 by 24 single doors	ditto	61	10	0
33 by 26 by 24 ditto	ditto	71	0	0
36 by 28 by 24 ditto	ditto	75	0	0
42 by 26 by 24 ditto	ditto	94	10	0
48 by 28 by 26 ditto	ditto	107	0	0
54 by 30 by 26 ditto	ditto	119	0	0
60 by 30 by 26 ditto	ditto	127	0	0
60 by 33 by 28 ditto	ditto	138	0	0
36 by 36 by 28 double doors	ditto	125	0	0
48 by 38 by 28 ditto	ditto	147	0	0
54 by 40 by 30 ditto	ditto	171	0	0
60 by 48 by 30 ditto	ditto	209	0	0
66 by 54 by 30 ditto	ditto	245	0	0
72 by 60 by 30 ditto	ditto	279	0	0
30 by 24 by 24 single door claw bolts	ditto	77	0	0
33 by 26 by 24 ditto	ditto	88	0	0
36 by 28 by 24 ditto	ditto	93	10	0
42 by 26 by 24 ditto	ditto	104	10	0
48 by 28 by 26 ditto	ditto	126	0	0
54 by 30 by 26 ditto	ditto	146	0	0
60 by 30 by 26 ditto	ditto	159	0	0
60 by 33 by 28 ditto	ditto	173	10	0
36 by 36 by 28 double doors	ditto	143	0	0
48 by 38 by 28 ditto	ditto	181	0	0
54 by 40 by 30 ditto	ditto	214	0	0
60 by 48 by 30 ditto	ditto	260	0	0
66 by 54 by 30 ditto	ditto	306	0	0
72 by 60 by 30 ditto	ditto	349	0	0

INVINCIBLE—		£	s.	d.
30 by 24 by 24 single doors	ditto	154	0	0
33 by 26 by 24 ditto	ditto	173	0	0
36 by 28 by 24 ditto	ditto	188	0	0
42 by 26 by 24 ditto	ditto	208	0	0
48 by 28 by 26 ditto	ditto	256	0	0
54 by 30 by 26 ditto	ditto	279	0	0
60 by 30 by 26 ditto	ditto	315	0	0
60 by 33 by 28 ditto	ditto	350	0	0
48 by 38 by 28 double doors	ditto	390	0	0
54 by 40 by 30 ditto	ditto	457	0	0
60 by 48 by 30 ditto	ditto	555	0	0
66 by 54 by 30 ditto	ditto	644	0	0
72 by 60 by 30 ditto	ditto	742	0	0

Any safe fitted with cast steel coffer, 18in. high, at an extra cost of £55, or with one 27in. high at £82 10s.		£	s.	d.
SAFES fitted with coffer—				
54 by 30 by 26 outside size	ditto	102	0	0
Ditto ditto with drawers and shelf	ditto	105	0	0
60 by 30 by 26 outside size	ditto	107	0	0
Ditto ditto with drawers and shelf	ditto	109	0	0
60 by 33 by 28 outside size	ditto	112	10	0
Ditto ditto with drawers and shelf	ditto	115	0	0
54 by 30 by 26 with large coffer	ditto	129	10	0
Ditto ditto with drawers and shelf	ditto	132	10	0
60 by 30 by 26 with large coffer	ditto	134	10	0
Ditto ditto with drawers and shelf	ditto	137	0	0
60 by 33 by 28 with large coffer	ditto	139	0	0
Ditto ditto with drawers and shelf	ditto	142	10	0

WROUGHT-IRON doors and frames (no fire chambers)—		£	s.	d.
5ft. 6in. by 2ft. 6in. outside of frames	ditto	16	15	0
6ft. 0in. by 2ft. 6in. ditto	ditto	17	15	0
6ft. 0in. by 3ft. 0in. ditto	ditto	21	0	0
6ft. 6in. by 3ft. 0in. ditto	ditto	23	10	0
7ft. 0in. by 3ft. 0in. ditto	ditto	25	0	0

TERRIBLE PATENT fire and thief-resisting doors—		£	s.	d.
5ft. 6in. by 2ft. 6in. horn frames	ditto	24	15	0
6ft. 0in. by 2ft. 6in. ditto	ditto	27	10	0
6ft. 0in. by 3ft. 0in. ditto	ditto	31	5	0
6ft. 6in. by 3ft. 0in. ditto	ditto	34	0	0
7ft. 0in. by 3ft. 0in. ditto	ditto	37	5	0
5ft. 6in. by 2ft. 6in. with grip frame	ditto	27	10	0
6ft. 0in. by 2ft. 6in. ditto	ditto	30	10	0
6ft. 0in. by 3ft. 0in. ditto	ditto	34	15	0
6ft. 6in. by 3ft. 0in. ditto	ditto	38	0	0
7ft. 0in. by 3ft. 0in. ditto	ditto	41	10	0

STRONGROOM DOORS—		£	s.	d.
6ft. 0in. by 2ft. 6in. straight bolts	ditto	50	0	0
6ft. 0in. by 3ft. 0in. ditto	ditto	56	0	0
6ft. 6in. by 3ft. 0in. ditto	ditto	60	10	0
7ft. 0in. by 3ft. 0in. ditto	ditto	67	0	0
6ft. 0in. by 2ft. 6in. dovetail sliding claw bolts front and back	ditto	60	0	0
6ft. 0in. by 3ft. 0in. ditto	ditto	67	0	0
6ft. 6in. by 3ft. 0in. ditto	ditto	72	10	0
7ft. 0in. by 3ft. 0in. ditto	ditto	81	0	0

Ditto of compound steel, with grip frame and claw bolts (List 7)—		£	s.	d.
6ft. 0in. by 2ft. 6in. outside of frame and straight bolt	ditto	93	10	0
6ft. 0in. by 3ft. 0in. ditto	ditto	98	0	0
6ft. 6in. by 3ft. 0in. ditto	ditto	109	0	0
7ft. 0in. by 3ft. 0in. ditto	ditto	121	0	0
6ft. 0in. by 2ft. 6in. claw bolt	ditto	105	0	0
6ft. 0in. by 3ft. 0in. ditto	ditto	124	0	0
6ft. 6in. by 3ft. 0in. ditto	ditto	135	0	0
7ft. 0in. by 3ft. 0in. ditto	ditto	151	0	0

OCTUPLE intersected steel doors, grip frame, and ventilating gates—		£	s.	d.
5ft. 6in. by 2ft. 6in. outside of frame	each	168	0	0
6ft. 0in. by 2ft. 6in. ditto	ditto	197	0	0
6ft. 0in. by 3ft. 0in. ditto	ditto	219	0	0
6ft. 6in. by 2ft. 6in. ditto	ditto	219	0	0
6ft. 6in. by 3ft. 0in. ditto	ditto	242	0	0
7ft. 0in. by 3ft. 0in. ditto	ditto	264	0	0

VENTILATING gates—		£	s.	d.
To fit 5ft. 6in. by 2ft. 6in. door	ditto	12	0	0
Ditto 6ft. 0in. by 2ft. 6in. ditto	ditto	12	15	0

Engineering Notes.

LIVERPOOL.—A special meeting of the Mersey Docks and Harbour Board was held on Monday to consider the question of providing additional accommodation in the river for Atlantic passengers, and railway facilities connected therewith. Mr. G. F. Lyster, the engineer, reported that he proposed to lengthen the Prince's landing stage by 300ft. at its northern end, and to construct a timber jetty about 400ft. long for the coasting trade. It was also proposed to run along the centre of the jetty a line of rails connected with the main line and two hydraulic cranes, and to provide an extension of dock and shed accommodation. A covered passenger station was proposed, about 500ft. by 80ft., on the east side of the roadway. Three lines of rail were provided for, and at the north end there would be a block of buildings for refreshment and waiting-rooms, offices, &c. The engineer estimated the cost of these works at £180,000, independent of the railway passenger station at the south end, which would cost about £40,000, making in all £220,000. A committee recommended that steps should be taken next session to obtain Parliamentary authority for the execution of these works, also to provide a new landing-stage, 1,200ft. in length, with railway accommodation connected therewith, for the landing of cattle, &c., at an estimated cost of £350,000. A motion for the adoption of the scheme was carried.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—On Saturday afternoon, the members of this association visited the terracotta works of Messrs. Joseph King and Co., at Netherend, near Stourbridge, and passed a considerable time in inspecting the different processes through which the clay passes. The visitors afterwards inspected the fireclay works of Messrs. King Brothers.—The annual conversation of the above association was held on Tuesday night at the Grand Hotel. The proceedings opened with a reception by the president (Mr. William Hale, F.R.I.B.A.), and among the members and guests present were Messrs. F. B. Peacock, W. H. Bidlake, C. E. Bateman, W. Hawley Lloyd, J. A. Cossins, H. Beck, Herbert R. Lloyd, J. H. Rogers, G. A. Cox, M. Cox, and A. Harrison. During the first hour those present were afforded an opportunity of examining the collection of drawings which had been got together for the occasion, prominent among them being the drawings of the Birmingham Assize Courts, by Aston Webb, some fine examples of pen-and-ink drawing by C. E. Mallows, Ernest George and Peto, E. J. May, H. H. McConnal, E. C. Bewlay, and water-colour drawings and sketches by W. H. Bidlake, G. A. Cox, and R. Phené-Spiers; whilst Mr. Hale sent a design for a new church at Stinchley-street, and Mr. C. E. Bateman some pencil sketches of domestic work; and some interiors were lent by Mr. Edward R. Taylor and Mr. J. Pratt. The reception was followed by a concert, at which recitations were given by Mr. H. Harvey and Mr. Whitworth Wallis, songs by Mr. Walter Crosbee, Mr. H. Monckton, and Mr. F. S. Hughes, and banjo songs by Mr. S. Lowcock.

BIRMINGHAM MASTER BUILDERS' ASSOCIATION.—The annual meeting of this association was held on Tuesday at the Grand Hotel, Colmore-row, Birmingham, Mr. C. H. Barnsley (president) in the chair. In the annual report the committee regretted that they were unable to state that the improvement in the state of the trade referred to in the three last annual reports had been maintained. All the manufacturing trades of Birmingham and the district had during the last twelve months experienced a great falling off of business, the result to a great extent of the keenness of foreign and other competition and hostile tariffs. The past year had been an eventful one in the history of the association owing to the strike of bricklayers and their labourers, which resulted in the arbitration clause in the rules being abolished, and an advance of 3d. per hour conceded; in other respects the rules remained as before. The continued decline of trade since this settlement had convinced the committee that they were fully justified in resisting to the utmost the demands of the

operatives. Notices for alteration of rules and increase of wages had been received from the carpenters and plasterers, and for alterations of rules only from the stonemasons. These would be considered in due course. The committee had felt it necessary, having regard to the present position and the future prospects of the trade, to give notices to the bricklayers and labourers to return to the rate of wages paid prior to April 1 last, also for other alterations. The committee had under consideration the revision of the schedule of daywork prices. The number of members had increased from 39 to 63; many of the new members joined the association while the strike was pending. The report and balance-sheet were adopted. Mr. W. Sapcote was elected president for the ensuing year; Mr. T. Rowbotham was elected vice-president, Mr. R. Bulley treasurer, and Mr. E. J. Bigwood secretary. The annual dinner afterwards took place, under the presidency of Mr. W. Sapcote.

SANITARY INSPECTORS' ASSOCIATION.—The opening address of the session of this association was delivered on Saturday at Carpenters' Hall, London Wall, by the chairman of council, Mr. Hugh Alexander, who congratulated the members upon the progress that had attended their efforts to unite sanitary inspectors under one association. Much still remained to be done to secure remedial legislation to enforce the proper remuneration of officers, and to improve the education, as well as to secure the efficiency, of candidates for the position of sanitary inspectors. He called attention to the evils frequently existing in back-to-back houses, and said that in London sufficient attention was not given to the necessity of houses being constructed on hygienic principles in all respects. Notable examples of this might be found in any district, not only in the East, but also in the West-end, and in close proximity to the most aristocratic quarters. They had continually complained of the defective state of the law which permitted such buildings to be erected. The reason which accounted for badly-built houses nearly always was, he asserted, to be found in the laxity of the architects concerned. He hoped the Royal Institute of British Architects would institute an inquiry and take steps to remove from its ranks those who, either wilfully or ignorantly, planned buildings in violation of the very first principles of sanitation. He suggested that the London County Council should be empowered, in conjunction with local authorities, to prohibit the erection of any dwellings, the plans of which evinced on the part of the architect ignorance of hygienic principles or disregard of the comfort and well-being of the people who might live in the houses.

CHIPS.

The foundation-stone of new schools, which are to be attached to the Roman Catholic Chapel at Sheffield, Staffs, were laid on Monday. The schools are to be built of red bricks, at a cost of £530, the architect being Mr. S. Loxton, and the builder Mr. Bantock, of Walsall.

At a meeting of the Bath City Council, on Tuesday, it was unanimously resolved to proceed at once with the new municipal buildings, from the amended plans submitted by Mr. J. M. Brydon. The contract with Messrs. Hayward and Wooster, builders, of Bath, for the erection of the buildings, was thereupon sealed.

The resignation is announced of Mr. Charles Fowler, district surveyor of Shoreditch and the Liberty of Norton Folgate. It is probable that the district will be amalgamated with some of the adjoining districts, and pending the decision of the London County Council, it has been placed in charge of Mr. Henry Lovegrove, district surveyor of South Islington.

A memorial slab to commemorate the late Mr. Oliver Heywood's deep interest in Chetham's College and Library, Manchester, has just been placed in the west wall of the entrance to the College library. The slab, which has been executed by Messrs. Earp and Hobbs, from the designs of Mr. J. Medland Taylor, of Manchester, architect, is of oblong form, and composed of Upton Wood stone. It bears the following inscription, carved in Gothic lettering:—"Pass not by without bestowing a thought of kindly remembrance upon Oliver Heywood, who, of his good will, did restore the dining-hall, reading-room, library, kitchen, dormitories, and cloisters between the years 1883 and 1890." During the seven years the restorations referred to were being carried out, Mr. Heywood insisted on his name not being mentioned in connection with the work.

Building Intelligence.

AVONMOUTH.—The foundation-stone of St. Andrew's Church was recently laid. The church will consist of chancel, nave, south aisle, and tower, and will seat 600 persons. At present the two west bays, the tower, and the vestry are omitted. The church is so designed that the north wall can be removed and another aisle added. The style is Decorated, and there will be elaborate tracery to the windows. The structure is of red stone, quarried at Shirehampton, and lined with Bath stone. Provision has been made for the tower on a large bed of concrete. The roofs will be covered with Broseley tiles, and inside they will be of pitch-pine, as the wood comes from the plane, neither painted nor stained. Ultimately the chancel will be laid with marble mosaic work, but this forms no part of the present undertaking. About £4,000 is being spent now, the contract for the entire scheme being rather over £6,000. Mr. W. Wood Bethell, of Westminster, is the architect; Messrs. R. Wilkes and Son, of Bristol, are the contractors; and Mr. G. Downs is the clerk of works.

BIRMINGHAM.—The Waverley-road Seventh Standard School was publicly opened last week. This is the first complete school erected by the Birmingham School Board for teaching a seventh standard. The school provides accommodation for 300 boys and 300 girls. It is a one-story building, and is arranged with a central assembly hall, surrounded by classrooms, workrooms, and laboratories. The assembly hall is 68ft. by 30ft. There are four entrances to the building, two for each sex, connected by a long corridor, which give access to the assembly hall and the various classrooms, laboratories, and workrooms, as well as to the school of cookery. Adjoining each entrance is a lavatory and cloakroom, over which are rooms for masters and mistresses. In the girls' division there are five classrooms, giving accommodation for 48 in each, and a cookery school, with accommodation for 60. In the boys' department there are six similar classrooms, each for 48 boys, a chemical laboratory, 60ft. by 30ft., a workshop of the same size, with a store for timber, and a lecture-theatre, seating about 100 children, with a preparation-room adjoining. Between the preparation-room and the laboratory are arranged a balance-room, combustion store, chemical store, and apparatus store. On the first floor over this a room is provided for preparing diagrams for lecturing purposes. The chemical laboratory is fitted up with six work-benches placed down the centre of the room. The architects are Messrs. Martin and Chamberlain, and the builder Mr. T. Rowbotham. The head master is Mr. H. K. Frew, late of the Central Higher Grade School at Leeds.

BRISTOL.—The designs prepared for the new Bristol Empire Palace of Varieties by Messrs. Wylson and Long, of 15, King William-street, Strand, have been passed by the local authorities, and a contract for its erection has been arranged with Mr. Frank Kirk. The new theatre is intended to be opened next Whitsuntide with a strong variety company. The building will be situated in the busiest portion of the city, and has been designed to be used not only as a theatre, but, by a simple mechanical arrangement, the stage can be removed to give place to a circus ring.

CORNHILL.—A banking-house has just been completed at 50, Cornhill, for Messrs. Prescott, Dimsdale, Tugwell, Cave and Co., Limited. The building has been designed by Mr. Henry Cowell Boyes, architect, of Lincoln's Inn-fields, in a Georgian Classic style, in which red brick, relieved by Portland stone dressings to the windows and cornice, is employed, with grey granite basement and polished columns supporting a triple-arched window to the main banking hall. Stone balconettes are introduced to the second-floor windows. On the ground floor is a large hall, about 68ft. long by 37ft. wide, and 21ft. high, the walls lined by slabs of Derbyshire alabaster, which are divided into panels by mahogany Ionic pilasters and entablature along the lower portion of the walls, and a mahogany panelled dado. At the inner end is a directors' on-duty room and secretary's office, divided by a glazed screen. A staircase of teak, with mahogany balustrading and dado, leads to a gallery on one side of the bank and a mezzanine story for clerks. On the first floor are the board-room,

secretary's and staff rooms, luncheon and waiting room, all having mahogany doors and fittings, and a lift from kitchen to luncheon room. The two upper floors are set apart for the residential clerks. The hydraulic lift has been provided by Messrs. Waygood. One interesting feature of the new bank is the existence of fragments of the ancient Roman wall in the sub-basement. The buildings have been carried out by Messrs. W. Cubitt and Co. Mr. Payne was clerk of the works. We may add the cost has been about £25,000, and the bank has been provided with Shorland's Manchester stoves.

LONDON COUNTY COUNCIL.—At Tuesday's meeting of this body, the Parks Committee reported that the question of the purchase and maintenance of the Albert Palace was still under their consideration, and they hoped in a fortnight to make a report to the Council on the subject. As, however, it would be necessary, in the event of the Council deciding to undertake the maintenance of the Palace, to obtain power from Parliament for the purpose, and the necessary *Gazette* notice must be prepared this week, they recommended: That the Parliamentary agent be instructed to include the matter in the *Gazette* notice of one of the Council's Bills, and that the Parliamentary Committee be authorised to take any necessary preliminary measures with a view to the insertion in the Bill of a Clause empowering the Council, if it so resolved, to accept and to maintain for the public use the Albert Palace and grounds.—The report was adopted.

MAWDESLEY.—The reopening of Mawdesley parish church, near Ormskirk, which has been undergoing restoration, took place on Wednesday week. New benches have been provided throughout of pitch-pine, and arranged with central and two side passages. A gallery has been provided at the west end, while new screens have also been erected. The old flat ceiling has been removed, and the roof left open, being finished in plaster of cream colour, and having the timbers left visible. The work has been carried out by Messrs. Moore Brothers, contractors, of Rawten-stall, from the designs and under the superintendence of Mr. R. Knill Freeman, F.R.I.B.A., of Bolton and Manchester.

NEWCASTLE-ON-TYNE.—The Hotel Metropole was opened on Monday. It consists of two older hotels, in Clayton-street, converted into one, and much altered and renovated internally. There are two entrances from Clayton-street, connected by a corridor passing in front of the offices and business department. The main staircase is opposite the south door. On the ground floor are, with other apartments, a private dining-room, 40ft. by 24ft., smoking-room and billiard-room, 40ft. by 22ft. Opening from the billiard-room buffet, a smoking-room, and lavatory accommodation. The remaining public rooms are on the first floor. They consist of a commercial-room, 40ft. by 24ft., a ladies' dining-room, a private dining-room, and suites of apartments, comprising bedrooms and sitting-rooms. On the upper floors there are sixty bedrooms. In addition there are stock-rooms. Messrs. Lamb, Armstrong, and Knowles, who were the architects for the Grand Hotel and the Grand Assembly Rooms, were the architects. Mr. Tyrie, of Gateshead, had the contract, and Messrs. Green and Son, Grey-street, Newcastle, have done the decorative work.

RICHARD'S CASTLE.—The Foster Memorial Church was formally consecrated by the Bishop of Hereford last week. It has been built from plans by Mr. R. Norman Shaw, R.A., at the sole cost of the widow and daughters of the late Major Foster, replacing on a more convenient site the old parish church now disused. The outside stone is local, and the inside stone is dressed Grinshill. The nave and south aisle are seated to hold 300 persons, and one of the windows is an exact facsimile of one in the old church, having the ball-flower carved outside. The tower is semi-detached, and contains a tenor bell of the weight of 40cwt., cast by Messrs. Taylor, of Loughborough. A cradle for a full peal of eight bells is fixed in the tower, should they ever be added. The low chancel wall is surmounted by an iron screen, with gates; the hanging lamps are also of wrought iron. In the chancel are three old brass Italian hanging lamps. The pulpit and the organ-case are carved in walnut; the choir-stalls are of oak, carved with a vine pattern in perforated work. Above the altar a triptych is

placed. It contains seven panels. The centre panel represents the Crucifixion with two attendant angels. The Blessed Virgin is depicted in the panel on the immediate left hand of the centre, and St. John is shown on the right hand. Angels and saints are depicted on the shutters. The paintings in the triptych, together with the decorations of the east wall, have been executed by Mr. C. E. Buckeridge, of 21, Mortimer-street, London, W. Messrs. Farmer and Brindley made the framework of the triptych. The organ is being built by Messrs. Abbott and Smith, of Leeds, the case being of carved walnut, with spotted metal pipes. The general contractors were Messrs. Thompson and Son, of Peterborough.

SOUTHAMPTON.—The foundation-stone of a new post-office for this town was laid on Tuesday week. It will occupy the site of the old post-office and adjoining premises, and will extend from High-street to Back-of-the-Walls. The style of architecture is to be French Renaissance, and plans have been prepared by Mr. Henry Tanner, F.R.I.B.A., of Her Majesty's Office of Works. The front building is to be four stories in height. The public office will be 34ft. 4in. by 25ft. 6in., and 15ft. in height. At the back is the instrument room. On the first floor, offices for the postmaster and his clerks will be provided. On the second floor there are offices for other clerks, and the third floor will be devoted to the caretaker. The front elevation up to the first floor level will be faced with tawny terracotta, while the upper stories will be faced with red Fareham bricks and terracotta dressings. The sorting office will be 192ft. 2in. long, with an average width of 43ft. The contract has been secured by Messrs. Crook and Sons, of Northam, and the building will be supervised by Mr. James Atkinson, of Her Majesty's Office of Works, as clerk of works.

STANTON-ON-HINE HEATH.—The parish church was reopened last week after restoration. The mean iron-framed eighteenth-century windows have been replaced with tracery in the Decorated style. The plaster ceilings have been removed, and the original roof-timbers exposed to view. The roofs of nave and chancel have been covered with oak boarding and Broseley tiles. The gallery and box pews—the latter extending into the chancel—have been removed, and the nave has been re-seated with open sittings in pitch-pine. When the south wall of nave was cleared of ivy and plaster an octagonal pillar, intact, with cap and base, and portions of two arches with the corresponding jambs, were discovered near the east end, showing that there had once been an aisle or side chapel. These arches have been carefully restored. New oak doors, with wrought scroll hinges, have been fitted to porch and vestry, as also to the Norman doorway on the south side, which had previously been bricked up. The whole of the nave floor has been tiled. The old carved oak Jacobian pulpit has been refixed on a stone base. The tower, the upper portion of which is of fifteenth-century date, has had new tile roof, the decayed stone pinnacles replaced with new ones; vane fitted with new copper weathercock and lightning conductor. The chancel arch has been rebuilt, and other new works are parapet wall and gable cross, chancel steps and dwarf wall, three-light east window, angle buttresses at east end, coping and gable cross, Runcorn stone reredos, with alabaster shafts and white marble cross, encaustic tile floor, oak choir stalls, vicar's seat, and prayer-desk. The old oak panellings from pews have been fixed as a dado to chancel, and the old oak balustrade has been refixed as a Communion rail. The whole of the work has been carried out from the designs and directions of Mr. A. B. Deakin, architect, of Castle Chambers, Shrewsbury, the general contractor being Mr. Thomas Chaloner, builder, of Hanwood. The total cost of the restoration has been about £1,300.

H.M. Board of Works is carrying out a scheme for the preservation of the ceilings and walls of certain portions of the historical apartments of Holyrood Palace. No attempt has been made to restore the colouring, but simply to preserve what remains, and this it is believed has been accomplished by the careful application of several coats of transparent varnish. The old stained look of the ceilings has not been altered by this operation. The work is being done by Mr. A. Muirhead, 14, Castle-street, under the personal supervision of Mr. W. W. Robertson, of the Board of Works.

COMPETITIONS.

ABERDALE INTERMEDIATE AND TECHNICAL SCHOOL COMPETITION.—In the above competition the assessor was Mr. Ewan Christian, F.R.I.B.A., and the selected design was that submitted by Mr. J. H. Phillips, M.S.A., architect, St. John's Chambers, Cardiff. The selection has been approved by the committee, and Mr. Phillips has been appointed to carry out the work. The estimated cost is £3,300.

ALLOA, N.B.—At a joint meeting of the Burgh Commissioners and County Council representative held at Alloa on Monday, a short list of two sets of plans for a fever hospital were submitted from Messrs. J. Melvin and Son, architects, Alloa, and Messrs. Johnstone and Burnie, architects, Edinburgh. After consideration of a special report on the plans by Mr. Whitson, measurer, Glasgow, the meeting unanimously resolved to accept the designs submitted by Messrs. Melvin, the estimated cost of which is about £5,000. The plans provide for an administrative block, having ample accommodation for doctors' rooms, matron's rooms, kitchen, &c., with bedrooms for servants, &c., on the top flat. The design of the building is a simple treatment of the Old English style, the gables being filled in with timber and plaster, and the architects have endeavoured to give the effect of a cottage hospital. The total accommodation provides for 24 beds in the main pavilion, and four in the probationary wards. It is proposed to erect the hospital on a site near Parkhead farm, to the north of the town of Alloa, and the work will be proceeded with shortly.

NEWCASTLE-ON-TYNE.—The assessor appointed by the directors of the Newcastle-upon-Tyne Masonic Hall Company, Limited (Mr. C. Barry, P.P.R.I.B.A., Grand Superintendent of Works for England), has awarded the first premium to the design submitted by Mr. John Johnson, A.R.I.B.A., 9, Queen Victoria-street, London, and the second premium to the design submitted by Mr. H. T. Bonner, A.R.I.B.A., King-street, Cheapside, London, E.C.

"OWEN JONES" PRIZES.—This competition was instituted in 1878 by the Council of the Society of Arts, as trustees of the sum of £400, presented to them by the Owen Jones Memorial Committee, upon condition of their expending the interest thereof in prizes to "Students of the School of Art who, in actual competition, produce the best design for household furniture, carpets, wall-papers and hangings, damask, chintzes, &c., regulated by the principles laid down by Owen Jones." The prizes are awarded on the results of the annual competition of the Science and Art Department. Six prizes were offered for competition in the present year, each prize consisting of a bound copy of Owen Jones's "Principle of Design," and a bronze medal. The following were the successful candidates:—Robert Dow, School of Art, Glasgow: design for a printed hanging. Florence Morris, School of Art, Hertford: design for a plate. William Spiers, School of Art, Glasgow: design for a hanging. Ella B. Ginn, School of Art, Hertford: design for wall-tiles. Ada Hasleham, School of Art, Cavendish-street, Manchester: design for a printed cotton. Joseph G. Slade, School of Art, Cavendish-street, Manchester: design for calico prints.

WAKEFIELD.—The County Council of the West Riding of Yorkshire invite competitive plans for the erection of council chamber, committee rooms, and offices at Wakefield. Premiums of £200, £100, and £50 respectively are offered for the three best designs.

WALSALL.—At the annual meeting of the corporation, held on Wednesday week, it was decided to appoint Mr. J. MacVicar Anderson, P.R.I.B.A., as assessor to report on the competitive plans received for the new Town Hall, at an inclusive fee of 110 guineas.

The plans and scheme of Mr. A. P. J. Cotterell, C.E., of Bristol, have been adopted for an improved supply of water to Bruton, Somerset.

Mr. Mundella opened on Thursday the new buildings of the Maria Gray Training College, which have been erected in Salisbury-road, Brondesbury. The new college and the adjoining Brondesbury and Kilburn High School have been erected, from the designs of Mr. J. Osborne Smith, at a total cost of £11,500. Accommodation is provided for 75 day students and 200 children.

Correspondence.

"SEASIDE ARCHITECTS."

To the Editor of the BUILDING NEWS.

SIR,—Your very interesting article of a few weeks ago, on "Seaside Architecture," leads me to make a few remarks, not so much on the architecture as on the architects of our seaside resorts, or, at least, as regards my experience of them. I am a young architect, fresh from a first-class office in the North of England, and have settled down here with the intention of commencing a practice. The state of the profession has struck me rather peculiarly. In this district architects advertise in the local papers just as any tradesman would; the way work is canvassed is something original to me. As soon as it is made known that a party intends building he is at once besieged, each architect (so called) trying to out the other out with temptingly low offers. One and a half and 2 per cent. seem to be the rule—5 per cent. a thing almost unknown. An idea as to the status of the profession locally may be gathered from the fact that recently a certain gentleman sent round to all the architects in the place, asking for tenders for the preparation of certain plans!

Two or three local builders have informed me that they are constantly receiving circulars begging for work from one of these "architects, surveyors, land and estate agents, &c.," accompanied by a lithographed sheet of elevations of work done by him.

Everyone dabbles in plan-drawing here—joiners and bakers, beer-sellers and fishmongers—all join in doing the poor architect out of his dues.

As regards the architecture of the district, the less said the better—it may be easily inferred. Whether architecture is an art or a profession, it appears to me that something ought to be done. May the much-hoped-for Registration Bill come soon, is the fervent wish of—Yours, &c.,

HERBERT WADE.

St. Annes-on-the-Sea, Lancs.

MR. HENRY PARSONS.

SIR,—In September last a report of the conviction at Lambeth Police-court of Mr. Henry Parsons, the well-known district surveyor for Lambeth and Camberwell, for travelling on the London and South-Western Railway without previously paying his fare, was widely circulated by the Press. Mr. Parsons was so unnerved at the charge, coupled as it was with a statement altogether unexpected by him, and quite unsupported by positive evidence, that he had for many years been in the habit of travelling on the line without payment of his fare, that he was unable when before the magistrate either to properly cross-examine the witnesses or to put before the Court any complete explanation of the circumstances under which he had travelled down on the evening of June 28th and upon the morning of June 29th without a ticket. There was no appeal from the conviction, and though Mr. Parsons circulated an explanation amongst his friends, he was unable, on account of its length, to give it wide publicity.

Within the last few days an opportunity has been afforded Mr. Parsons of stating the facts of the case fully on oath, and of producing evidence in support of his own statement, a motion having been brought forward in the Chancery Division of the High Court to remove him from the position of Receiver in a pending action on the ground of the above mentioned conviction.

The result of the proceedings last Friday before Mr. Justice Chitty, was the continuance of Mr. Parsons in the position of Receiver, at the desire of various eminent counsel representing the parties to the action, who expressed their complete satisfaction with the explanation given by Mr. Parsons and their respective clients' entire confidence in him.

The position in which Mr. Parsons was thus continued by the Court involves the receipt by him of about £7,000 per annum, and is therefore one of great responsibility.

We are sure that you will feel it right to give publicity to this result, and thanking you in advance,—We are, &c.

SHAEN, ROSCOE, MASSEY, AND CO.
8, Bedford-row, W.C., Nov. 15.

Intercommunication.

QUESTIONS.

[10886].—**Breaking Weight.**—What is the breaking weight in tons of a post 8in. by 8in. by 12ft. long, adopting the formula $BW = 7.81 \frac{D^4}{L^3}$ and how can I find the

side of a square wood post when the weight to be supported and length of post are given? In calculating the stresses of a rolled iron beam uniformly loaded and fixed at both ends should, the formula be $\frac{WL}{12D^3}$ and in finding

such stress should, any allowance be made for the web, and if so, how much?—STUDENT.

[10887].—**Cubing Buildings for Approximate Cost.**—Would one or two of the numerous readers kindly inform me the correct way to take out these dimensions, and am I right in taking outside of walls both ways and from the bottom of footings or concrete to half-way up the roof, irrespective of pitch of roof? An early answer will oblige.—IN DISPUTE.

[10888].—**House Drainage.**—The drainage of a large house, which has been recently reconstructed with new drains, disconnecting chambers, and ventilation, ultimately empties into a cesspool, which receives all wastes from baths, sinks, w.c.'s, &c. This cesspool is covered with an air-tight man-hole cover, and the overflow, running into a ditch, is trapped also, thus making the cesspool air-tight. I am told that this air-tight cesspool, which is emptied once in six months, and is no apparent nuisance at present, must be ventilated, or the sewage gas generated will force, or, at any rate, come through, the water in the trap, and that a ventilating pipe would relieve the pressure. I have read several textbooks, but the writers do not agree as to the advisability of such ventilation or not. Can any of your readers put me right from actual experience?—FIFTEEN YEARS' SUBSCRIBER.

[10889].—**Red Spider.**—About eighteen months ago I completed a house of considerable size in the outskirts of this town. The house is built of brick of a deep red colour, and the stonework is also red in tint from the Corncockle quarries of Dumfriesshire. The carpenter's work is of red deal, and the joiner's work of oak and red deal. During the last summer the house has been visited by a plague of insects, infinitesimal in size and red in colour. These covered the whole of the windows, both inside and out, particularly those of the ground floor. What these insects are, or where they come from, we have been utterly unable to discover. Have any of your readers had a similar experience, and if so will they kindly enlighten me as to what these insects are if not a spider, where they come from, and if any means can be adopted to prevent the recurring of such unwelcome visitors?—J. M. BOTTOMLEY, Architect, Middlesbrough.

[10890].—**Surveyors' Charges.**—Where a building is erected under a schedule of prices, is it usual for the builder and building owner each to pay their own surveyors' charges for measuring up work?—TAPR.

[10891].—**Covered Way.**—Is it necessary to obtain the London County Council's permission to erect an iron and glass covered way at first floor level across a private yard to connect two buildings.—FIREPROOF.

REPLIES.

[10878].—**New Lights in Old Boundary Walls.**—An adjoining owner has a legal right to insert new windows in boundary wall, but the owner of yard and gateway has a right to block out the light coming to the window by erecting a high fence or building as proposed over the 8ft. space. If possible, come to terms with adjoining owners.—G. H. G.

[10880].—**Fireproof Floors.**—I should be inclined to recommend either Dennett's or Homan and Rodger's system. Homan's patent floor appears to fulfil the requirements of domestic buildings of a large size, though other methods may be preferred in special cases. It would be difficult to say without plans of the buildings which system would be the best. For small dwellings a simple system of iron joists, with some intervening stiffener for a layer of concrete, is called for. No doubt local authorities of large towns will find it necessary to restrict the use of wooden floors for large buildings, whether domestic or otherwise, and to make it compulsory to adopt fireproof construction.—G. H. G.

[10882].—**Water Pipes.**—I should recommend the lead-lined block-tin pipes if the water is very soft. Cast iron is well adapted for large pipes, but for small ones the danger of rusting is against their employment. Wrought iron and steel pipes are now used with much success, and they are cheap and durable, and can be easily jointed and bent, the only objection being their liability to rust. I am not sure if wrought-iron pipes are now in the market protected against this. Probably some correspondent will be able to give information. In America and the colonies wrought-iron and steel pipes are largely used.—G. H. G.

A meeting-house and schools for the Society of Friends were opened last week in Rochdale. The building, two stories high, is built of Horwich stock bricks, with stone dressings and overhanging eaves. The schoolroom occupies the ground floor, and seats 150 persons. The meeting-room on the first floor will seat about 150 persons, is finished in pitch-pine, varnished, and has a half-open roof. The ventilating is effected by means of Messrs. Robert Boyle and Son's air-pump ventilators. The work has been carried out from plans prepared by Mr. J. H. Burton, architect, of Radcliffe, who superintended the erection of the building. The chief contractors were:—Brickwork, Messrs. Makin and Sandford; stonework, Mr. George Openshaw; woodwork, Messrs. Collier and Smith—all of Radcliffe. The cost was £900.

Legal.

LEASES AND "OUTGOINGS."

THE Public Health (London) Act 1891 is likely to give a good deal of trouble to leaseholders. Of course this statute is only an extension of the Public Health Act 1875 to the metropolis. But in regard to the sanitary requirements it affects a different class of property, and will be found to bear hardly on many lessees of old town houses. The idea in the minds of most of its promoters was, doubtless, to throw the burden of repairing sanitary defects in town dwellings upon their owners, and with this view the Act provides that in the case of a nuisance arising from structural defects the landlord is the proper person to be served with notice to abate, and the duty is cast upon him of remedying the defect. But those who thought that this clause in the Act would throw the burden on the ground owner forgot the covenants in the leases under which most of our town dwellings are held. It is true the law makes the landlord responsible to the public; but, generally speaking, his lease contains stringent clauses as to repairs and the payment of all "outgoings," under which the lessee is made liable, over to him. The Act, therefore, does its best by rendering the owner in the first place compellable to abate the nuisance—which is well; though the private contract between the parties to the lease may ultimately cast the burden upon the tenant, for whom it was really never intended.

This state of things has just been exemplified in the recent case of *in re Bettingham* (*Times*, Nov. 6), where the question arose over a house in Delahay-street, Westminster. The lease contained clauses under which the tenant was to pay all rates and taxes, and also all "assessments and outgoings whatsoever, whether Parliamentary, local, or otherwise, now or at any time, during the said term, to be imposed, charged, or assessed upon the said premises, or the owner or occupier thereof." The tenant found the drainage defective, and applied to the landlord to do the needful repairs, stating that, unless he did, there would be an application to the sanitary authorities, under the Act, by whom he would be compelled to abate the nuisance. The result was an arrangement under which the tenant did the work, it being agreed that the cost should be ultimately borne by the party who would be legally liable had the landlord been, in fact, called upon to do it under the Act of 1891. A summons to decide this question was taken out, and it came on for hearing before Mr. Justice North, who now held that, by the words above quoted from the lessee's covenant, it was clear that they were liable. He based his decision specially on the word "outgoing," and the earlier case of *"Budd v. Marshall"* (L.R. 5, C.P.D. 481), where tenants had been held responsible on the word "duty" in a similar covenant. He also held that even if the defect arose from ordinary wear and tear and long user, for which the lessees were not liable under their covenant to repair, still, they would be responsible upon their other covenant as to "outgoings" for which the landlord had had to pay the local authorities.

FRED. WETHERFIELD, Solicitor.

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NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

LEGAL INTELLIGENCE.

THE BUILDER AND HIS PROPERTY.—At Hartlepool Petty Sessions on Tuesday week William Oddy, builder, of West Hartlepool, appeared in answer to a summons charging him with allowing a certain portion of his property situate in Frederick, Back Frederick, and Hermit-streets, Throston, to be in such a condition as to be dangerous to health. Evidence was given by Mr. J. Bridges (sanitary inspector), Mr. H. C. Crummach (borough engineer), and Dr. Rawlings (medical officer). The Bench eventually made an order for the nuisances to be abated within 21 days. There were other summonses against defendant for similar defects, but these were adjourned, he promising to abate the nuisance.

BREACH OF BUILDING LAWS.—Mr. J. Lavery, Great Patrick-street, Belfast, was charged at the police-court of that city on the last inst. with

building, and proceeding with buildings, in Marshall-lane, despite the refusal of the council to pass the plans. Mr. Munce, the assistant surveyor, and Mr. Meyer stated that the plans were never approved of, and that Mr. Lavery had received notices by the half dozen to that effect, and other witnesses proved that he had proceeded with the building despite this. Defendant was fined £10.

IN RE J. J. LUKE.—The examination of John James Luke, builder, of Park View, Alverstoke, took place at Portsmouth Bankruptcy Court last week. The statement of affairs showed gross liabilities amounting to £2,556 19s. 10d., of which £512 13s. 4d. was expected to rank for dividend. The assets were valued at £245 13s. 6d.; leaving a deficiency of £266 19s. 10d. The debtor attributed his failure to the loss of over £110 by the Portsea Island Building Society; to slackness of the building trade, and to pressure by creditors. The debtor admitted that he failed three years ago, and that he obtained his discharge about a twelvemonth afterwards. He was allowed to pass.

WOOD AND IRON VERANDAHS.—The following was a case under the Metropolitan Building Act. At the South-Western Police-court, on the 11th inst., Messrs. Strudwick and Co., builders, Ealing, were summoned for erecting a wood and iron verandah contrary to section 26, and without first giving notice to the district surveyor. The case was before the court on the 30th September last, when Mr. Cheston, the district surveyor, agreed to an adjournment to enable the defendants to apply for the sanction of the London County Council. Mr. Cheston said he found that no application had been made to the Council, and also that he had received no communication of any kind respecting the structure. Evidence having been given as to the irregularity, the magistrate made an order for removal, and inflicted a fine of £5 and cost for neglect to give notice.

ACTION AGAINST AN ARCHITECT AND SURVEYOR.—At the Wantage County-court last week Judge Snagge heard a claim by Wm. Bass Sivell v. H. William Hanson for £50 salary and damage for wrongful dismissal. The plaintiff, who lives in London, advertised for a situation as architect's assistant and came in communication with the defendant, an architect, of Letcombe Regis, and surveyor to the Wantage Highway Board. Defendant offered plaintiff £2 a week for the first six weeks and £2 10s. for the next six months, but at the end of the first six weeks discharged him. It was claimed that a contract was entered into for six months, and salary for overtime was also claimed. Plaintiff had brought his wife to Wantage and settled there. His Honour gave judgment for £10 damage for dismissal and £6 10s. for overtime and costs.

AN ARCHITECT'S CLAIMS FOR FEES.—At Newport County-court on Thursday in last week, before his Honour Judge Owen, the case of Swash v. Remy and Gilmore was heard. The plaintiff was Mr. A. Swash, architect, Newport, and the defendants were Newport pilots. The claim was one for fees for plans and superintendence of the erection of houses for the defendants. There was also a counter claim on the part of the defendants, who alleged negligence on the part of Mr. Swash. Plaintiff stated that in February, 1891, he was engaged by the defendants to obtain a site and draw out plans for two houses to be erected in Waterloo-road. He prepared two sets of plans, owing to the first plans being too expensive. He was instructed to prepare the new plans for houses which were not to exceed £600 each. Defendants were satisfied with the new plans, and tenders were obtained. The lowest was that of Mr. Westacott, the amount being just over £1,200, which was accepted. Witness had given a final certificate. In cross-examination, witness said that his certificate, which said that in "the architect's opinion the work was satisfactorily completed," was not given in the usual form. Witness admitted that the work was not completed on the 17th August last, and no work had been done since. He then wrote to the defendants saying he was willing to refuse to give a final certificate if the defendants would indemnify him against legal proceedings. On September 6th he was waited upon by a deputation from the Master Builders' Association, and on the same date he gave his final certificate, after examining the plans, specifications, and estimates. The principal item in dispute was as to the mullions of the windows, which, it was contended the plans showed, should be 14in., whereas the contractor had put in 9in. mullions. In re-examination, witness produced Westacott's bills of quantities, which showed that the contractor had estimated his contract on 9in. mullions. Witness considered that defendants had received full value in the houses, and he was willing to give defendants £100 more for the houses than they had cost. Mrs. Laura Gilmore stated that she was present at the interview which her father-in-law had with Mr. Swash. Defendant was instructed to prepare plans for houses to cost between £500 and £600. Witness had negotiated for the sale of the site. Henry Rry, one of the

defendants, and father of the last witness, said that he instructed plaintiff in the first instance to prepare plans for a £600 house; he left the negotiations to his daughter, and she several times in his presence told the plaintiff that they wanted £600 houses. Defendant had never given Mr. Swash instructions to prepare a plan for stable, &c.; neither did he instruct plaintiff to negotiate for the purchase of the site. Mr. W. H. Dashwood Capel, architect, Cardiff, stated that the back walls showed evidence of damp, and should either have been slated or cemented. Mr. Edward Bruton, architect, Cardiff, agreed with the last witness, and said that the windows were not wind and water-tight. Mr. Charles Miles, builders' surveyor, agreed with the evidence of the last two expert witnesses. After hearing expert evidence on behalf of the plaintiff, his Honour decided that the plans showed that the walls should have been 14in., and said that the plaintiff had given his certificate improperly, and he expressed a strong opinion upon the fact that he had altered his views as to the original plan after receiving a deputation from the Master Builders' Association. He gave judgment for the plaintiff for £12 11s. 6d., and judgment for the defendant on the counter claim, evidence to be given as to the amount of damage at the next court.

MAXIMUM HEIGHT OF CORNER BUILDINGS.—Mr. Curtis Bennett heard a summons on Friday against Messrs. Lawrence and Son, builders, for erecting a block of residential flats at the corner of Kensington-court of a greater height than the width of the new street in which they were situated. The building is situated on the western side of Kensington-court, with a flank to Kensington-road, and is 74ft. in height, being, if measured from the court, 25ft. higher than allowed by the Act. For the defence, Mr. Dickens contended that the building was in the Kensington-road, and not in Kensington-court. It was one building with one entrance. According to the award in the Appellant Court of the London County Council the building was in Kensington-road. Mr. Curtis Bennett found as a fact that the building was in Kensington-road, and dismissed the summons. In dealing with the question of costs, the magistrate said that as the County Council had held their hands from April to October, he should order them to pay 10 guineas costs.

RIVAL BUILDERS.—At the Leyton Police-court, on Friday, Edgar Allen Chatterton, a builder, was summoned for threatening to have Edward James Hannen, a caretaker, murdered. The defendant entered into an agreement to put up certain houses in Albert-road, and obtained an advance from a building society upon the security of the houses. He left the houses unfinished, and the society took possession, and entered into a contract with a Mr. Chapman to complete them. The defendant went on to the premises, pulled down a bill, and threatened the complainant, who was the caretaker. The defendant was bound over in £10 to keep the peace. Chatterton was further charged with threatening William Faithful Chapman, the builder who is completing the houses, and he was also bound over to keep the peace in this case. He was also summoned for assaulting Mr. Chapman, and was fined 1s. and costs. A further summons against him for damage was withdrawn.

REVERSIONARY INTERESTS IN RIGHTS TO LIGHT.—LANE V. KELLY AND ANOTHER. —In the Queen's Bench Division on Monday, Mr. Justice Wright, sitting without a jury, heard an action by the owner in fee simple of houses and workshops, Nos. 3, 4, and 5, Bath-court, Clerkenwell, subject to leases granted for 21 years from July 10, 1885. The defendants in May last erected walls and houses 69ft. high opposite the plaintiff's premises at distances varying from 22ft. to 34ft., the result being to obstruct the windows in plaintiff's premises, and render them dark, unwholesome, and of less value, so that plaintiff's reversionary estate has been injured. The defendants denied that any injury had been caused to plaintiff's premises, and pleaded that all that was done by them was done with the full knowledge of plaintiff. Evidence was called on plaintiff's behalf to show that since the defendants' buildings had been erected the light had been diminished. For the defence, evidence was called to show that the original buildings opposite plaintiff's premises were only 10ft. away, and that in fact plaintiff's light and air were better now than formerly. Mr. Justice Wright, in giving judgment, said that as to No. 3—the warehouse and workshop—he had come to the conclusion that the top floor had not been obstructed by the defendants, and that the lower floor had not so good a light as formerly, the defendants' buildings being three times as high and twice as far off as before. Looking, however, at the cases of "Kino v. Rudkin" and "Kelk v. Pearson," it seemed to him that the question for him to decide was not whether there had been a diminution of light, but whether there was enough left for the reasonable use of the houses. He had come to the conclusion that, as to No. 3, enough light was left, and plaintiff must fail as regards that part of his case. As to Nos. 4 and 5—the dwelling-houses—

he thought plaintiff was entitled to recover damages, and adopted the view taken by plaintiff's expert, who put it at £2 10s. per annum. His judgment would therefore be for plaintiff for £30 damages and costs.

ARBITRATION AS TO REPAIRS AND FIXTURES.—In the Queen's Bench Division on the 8th inst., before Mr. Justice Grantham, the case of Robert Cook v. W. F. Tredwell and W. H. Dawes, of Upland House, Bath, executors of Solomon Tredwell, came on for hearing on further consideration. The action, which was for breach of two covenants to repair and the wrongful conversion of fixtures, originally came before his lordship and a jury in May last, and was, by consent, referred to Mr. Squarey, architect and surveyor, of Salisbury. The arbitrator sat at Bath, and found that all the repairs which defendants were called on to do were executed, but it was admitted that the work was not done within the two months specified by the covenant. For the conversion of fixtures Mr. Squarey had awarded the plaintiff £29 15s. Mr. Pollock now argued that as the repairs were not executed within the two months provided by the covenant, that was a technical breach, and entitled the plaintiff to the £2 which the defendants had paid into court. He also asked for judgment as to the question of the fixtures. Dr. Blake Odgers, for the defendants, argued that there could be no justification for paying out to the plaintiff the £2 lodged in court. He contended that the defendants had substantially won on the fixtures, because, while the plaintiff claimed £307, he had been awarded £29 15s. Mr. Justice Grantham said his *indemnity* *for* the defendants upon all the issues as to repairs, and with costs, except the arbitrator's costs; the £2 paid into court must be paid out to the defendants. There must be judgment for the plaintiffs on the issue as to the fixtures, and costs, except, again, the costs of the arbitration. The defendants would have the general costs of the suit, and each party must pay his own costs of the arbitration, and half of the arbitrator's fees.

IN RE W. F. ROBERTSON.—The debtor, who lately carried on business as a cement manufacturer at the West Drayton Cement Works, passed his examination on Tuesday upon a balance-sheet which showed unsecured liabilities £8,894, with assets £293.

CLAIM BY AN ARCHITECT.—At the Crewe County court on the 9th inst., George Balshaw, architect, Southport and Crewe, sued T. R. Hunt, draper, Crewe, for £18 12s. for plans and sketches prepared and other work done in connection with a house which the defendant had had built. The plaintiff stated that he called upon Mr. Hunt, taking with him some plans he had by him. The defendant made some suggestions as to alterations, and fresh sketches were prepared. He spent 49 hours in the preparation of the plans. Subsequently, at the defendant's request, he took a sketch of a house at Southport, and at a later date went to the site of the proposed erection and took the levels. Mr. Hunt seemed perfectly satisfied with the plans at that date; but subsequently he told him that he had determined to employ a Crewe architect, as he was afraid a Southport man could not give so much attention to the work. On examining his diary, the plaintiff found that he had spent 120½ hours altogether on the defendant's work. Mr. Chester said the plaintiff called upon Mr. Hunt and asked for the job—in fact, touted for it, and it was for this calling apparently that the 16 guineas was to be charged. The defendant bore out this statement, and Mr. Dobson, architect, Crewe, said five guineas was a very good price to pay for such a plan as the plaintiff had made. Judge Hughes gave judgment for the plaintiff for £5, which had been paid into court.

A refuge and shelter for women has just been provided in Paul-street, Liverpool. It consists of disused baths and wash-houses acquired from the Liverpool Corporation, and adapted for their present purpose from plans by Messrs. Ware and Rathbone, architects, of Dale-street. The works have been executed by Mr. G. C. Beesham, Brading-street, in the same city, at a cost of £4,000.

The Bishop of Dover visited Ashford on Monday for the purpose of formally opening the newly-erected parish-room. The side of the building next the College has, like it, oak timber framings and stucco panels, whilst the front facing the churchyard is of Kentish rag stone, with dressings to agree with the style of the church. Internally the rooms are faced with red brick, with a pinewood dado all round, 5ft. high. The main room is 55ft. by 25ft. with a raised platform at one end. The accommodation of the large room, exclusive of the platform, is for 220 adults, whilst the classroom will take 30 in addition. The windows are Elizabethan in character. The work has been carried out by Mr. E. Dryland, builder, of Ashford, from the designs, and under the direction, of Mr. R. Philip Day, 20, John-street, Adelphi, London.

WATER SUPPLY AND SANITARY MATTERS.

SEWAGE DISPOSAL AT SALE.—The Local Government Board has now approved of the scheme prepared by Mr. A. G. McBeath, surveyor to the Board, for the purification of the sewage of the township, and given its sanction for the borrowing of the money, about £19,500, necessary for the purchase of the land and the execution of the various works. The system to be adopted for the purification of the sewage is one of precipitation and filtration. The effluent will flow into the Mersey by gravitation. The sludge will be treated so as to form manure. The site of the works is near the Bridgewater Canal, and will cover an area of 5½ acres, but the total area to be acquired for sewage and other purposes is 15½ acres, leaving ample room for extension hereafter if necessary. The amount sanctioned by the Local Government Board will be borrowed for terms of years ranging from 15 to 50 years.

WEST HARTLEPOOL.—The sanitary authority is actively engaged in many schemes for the further improvement of the district, including sewerage works, street works, new abattoirs, &c. One of the most beneficial amendments, however, so far as the public health is concerned, is the new regulation in connection with the erection of new buildings, which requires that each new dwelling-house erected after the present date shall have a water-closet, together with a covered galvanised pan for the reception of the dry domestic refuse. Mr. J. W. Brown, A.M.I.C.E., the borough engineer, under whose supervision the new regulations have been made, has been a strong advocate for the water carriage system for many years.

CHIPS.

The Working Men's Club, Methley, has been ventilated throughout by Messrs. Baird, Thompson, and Co., London and Glasgow.

The local board of Bexley have decided to divide the offices of surveyor and inspector of nuisances, hitherto held by Mr. Boulter, and to retain the services of Mr. Boulter in the former capacity at £230 a year.

Alderman E. C. Patching has been re-elected for the second time Mayor of Worthing. His father, now in his 92nd year, still carries on business in the town as an auctioneer and builder.

In the last number of our paper, in a small paragraph about the opening of a mission-hall at Ashford, Kent, it was stated that Mr. P. Day was the diocesan architect. This, it appears, is not correct, as Mr. James Brooks, V.P. R.I.B.A., is the diocesan architect. So Mr. J. Martin Brooks writes us, and requests us to state.

A reading-room has just been provided for the two parishes of Warham All Saints and Warham St. Mary Magdalen, Norfolk. The building is situated in the former parish, and is built of white brick with red facings, being capable of seating over 300 people when the partition is opened. The architect was Mr. Arthur Reeve, of Westminster, and the contractor Mr. T. Platten, of Wells-next-the-Sea. Lord Leicester gave the ground and the bricks, and the rector found all other necessities at a cost of £500.

The premises No. 22, Silver-street, Durham, locally known as "The Durham Mustard Mill," are about to be considerably enlarged and altered by Mr. H. T. Gradon, architect, of Durham, for Messrs. Levy Bros., the owners of the property.

The infectious wards at the Dartford Union are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

Another memorial window is just completed in Manchester Cathedral, being a new four-light window on the south side of the recently-erected baptistery, at the west end of the nave. It forms a companion to one recently placed at the west end of the baptistery, and, like the other, has been executed by Messrs. Percy Bacon and Brothers, of London. It consists of four lights, the subject treated being the Saviour in the act of blessing little children.

For some few years there has been a great dearth of cottage property in the Pontefract district, consequent on the extension of collieries in the neighbourhood. In many instances three and four families have been residing in one cottage, and there has been consequent overcrowding, and high rents. Two firms of builders alone have now on hand the erection of 300 houses, and 100 more are being built by private enterprise.

A committee has been formed for carrying out a cathedral memorial to Edward Harold Browne, the late Bishop of Winchester. The memorial is to be a recumbent figure of the bishop on an altar tomb, designed by Messrs. Bodley and Garner. About £1,500 will probably be required.

Our Office Table.

The annual address of the President of the American Institute of Architects deals largely with matters of constitution and organisation. It appears that the eastern chapters, owing to long organisation, have secured general recognition in New York and Boston, and the younger chapters are making themselves felt, especially in Illinois and Kansas City. The Boston chapter refers to the building law of that city. The Boston Society of Architects drafted the original building law, and one of its members was made one of the Commission of three appointed to draft a new law. To this commission are referred all statutes, fountains, and works of art placed in public squares, parks, or buildings in Boston. The President also refers to the Bill to License the Practice of Architecture, which failed to become law in the State of New York, and to the false idea which militated against the Bill, that it was the intention of its advocates that the license shall precede, and eventually annul, the building laws, whereas such a notion was unreasonable, as the license and building law is a reflex one of the other; the law an epitome of the licentiate, the licentiate a warrant of the law.

The one hundred and thirty-ninth session of the Society of Arts was opened on Wednesday, when an address was delivered by Sir Richard Webster, Q.C., M.P., chairman of the Council. Among the papers to be read this session are those by Mr. Seymour Haden, on "The Disposal of the Dead," on Wednesday next; Mr. James Douglas, on "The Copper Resources of the United States," on November 30; and Mr. James Dredge, on "The Chicago Exhibition, 1893," on December 7. At subsequent meetings, the dates of which are not yet published, papers will be read by Mr. William Key, "The Purification of the Air Supply to Public Buildings and Dwellings"; Mr. Wilton P. Rix, "Pottery Glazes, their Classification and Decorative Value in Ceramic Designs"; and Sir Juland Danvers, K.C.S.I., late Public Works Secretary, India Office, "Indian Manufactures." A course of Cantor lectures on "Some Masters of Ornament" will be given by Mr. Lewis F. Day, on April 10, 17, 24, and May 1; and another on "The History and Practice of Mosaics," by Mr. C. Harrison Townsend, F.R.I.B.A., on May 8 and 15.

The old church at Arbroath was destroyed by fire on Monday morning, nothing but the semi-detached tower and spire (both added in 1832) being saved. The church was built in 1580, partly with the stone of the Abbey, and was enlarged and partially reconstructed in 1762. It contained some excellent carved work in the pews and an organ erected eleven years ago. The church and its contents were insured for £3,900, a sum which will not cover the estimated loss. The cause of the outbreak is unknown.

A CURIOUS action between a contractor and a builders' exchange was lately tried in Pennsylvania. In Pittsburgh, last year, the building-trades unions struck, at the beginning of the season, for increased wages and an eight-hour day. The master-builders united to resist the demand, and, after three months of idleness, the men gave up the struggle. During the strike, many journeymen, members of the unions, set up as contractors, hiring men on the Union terms, instead of siding with the master-builders in the effort to resist the Union demands. When these new contractors tried to buy materials, however, they found that most of the dealers were members of the Builders' Exchange, and would not sell goods to any customers not members of the Exchange. This caused the new contractors loss, as well as delay, and one of them, a man named Buchanan, applied to the Courts for redress, setting the damage which he had suffered at 350 dollars. Buchanan's suit is simply a test case, and if the decision is favourable to him, many other similar suits will be entered. The case has now gone through the inferior court, which has given a verdict for the petitioner; but an appeal has been taken to the Supreme Court.

The Bishop of Peterborough preached at the parish church of Ashby-de-la-Zouch on Friday, and unveiled a memorial window by Messrs. Lavers and Westlake and dedicated a carved oak screen designed by Messrs. St. Aubyn.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. Business Meeting. 8 p.m.
Society of Arts. Cantor Lecture No. 1. "The Generation of Light from Coal-Gas," by Prof. Vivian Lewes. 8 p.m.
TUESDAY.—Institution of Civil Engineers. Discussion on papers on Graving Docks. 8 p.m.
WEDNESDAY.—Society of Arts. "Cremation as an Incentive to Crime," by F. Seymour Haden. 8 p.m.

CHIPS.

Mr. James Lemon, J.P., F.R.I.B.A., M.Inst.C.E., has been re-elected Mayor of Southampton.

Mr. E. Stanley Holland has been appointed borough surveyor of Leominster.

The opening meeting of the Manchester Association of Engineering Students was held on Wednesday week, when Mr. Lionel B. Wells, M.Inst.C.E., the president for the current session, delivered his opening address.

The Governors of St. Thomas's Hospital, London, on Saturday applied to Mr. Justice Kekewich for permission to sell out Consols to enable them to raise £16,000 for the erection of a new medical school on the Embankment. His Lordship, while expressing himself in favour of the scheme, adjourned the application for certain formalities to be proved, saying a building contract might meantime be entered into.

It is satisfactory to be able to state that Mr. Tate has renewed his offer to present his valuable collection of pictures to the nation, and that the offer will probably be accepted within the next few weeks. The difficulty of finding a site for the new gallery has been almost surmounted, and it is hinted that the new edifice will be in the neighbourhood of Westminster.

New Sunday-school buildings were opened at Layerthorpe, York, on Tuesday week. The chief room is 46ft. by 21ft., with classroom 17ft. by 14ft. Mr. George Kidd, of Spen-lane, York, was the contractor.

A serious landslip has occurred at Clacton-on-Sea, a mass of the cliffs, weighing about 4,000 or 5,000 tons, opposite the first Martello tower, falling on the beach. With the cliffs went the remains of the small battery which stood between the tower and the shore.

A free library was opened at Leominster on Thursday in last week. A house in South-street has been acquired and refitted for the present purpose, from plans by Mr. F. R. Kempson, architect. The contractor was Mr. Henry Milward, of Leominster, and the work was carried out under the supervision of Mr. J. W. B. Rooke, the borough surveyor. The amount of the original contract was £900.

On Friday a new Wesleyan Chapel was opened at Dishforth, Boroughbridge. Mr. Stokes was the architect, and Mr. Jackson, of Thirsk, the builder.

The session of St. Paul's Ecclesiological Society was opened last (Thursday) evening, when a lecture was delivered by the Rev. G. F. Browne, B.D., F.S.A., Canon of St. Paul's, on "Christian Art in Early England" with lime-light illustrations.

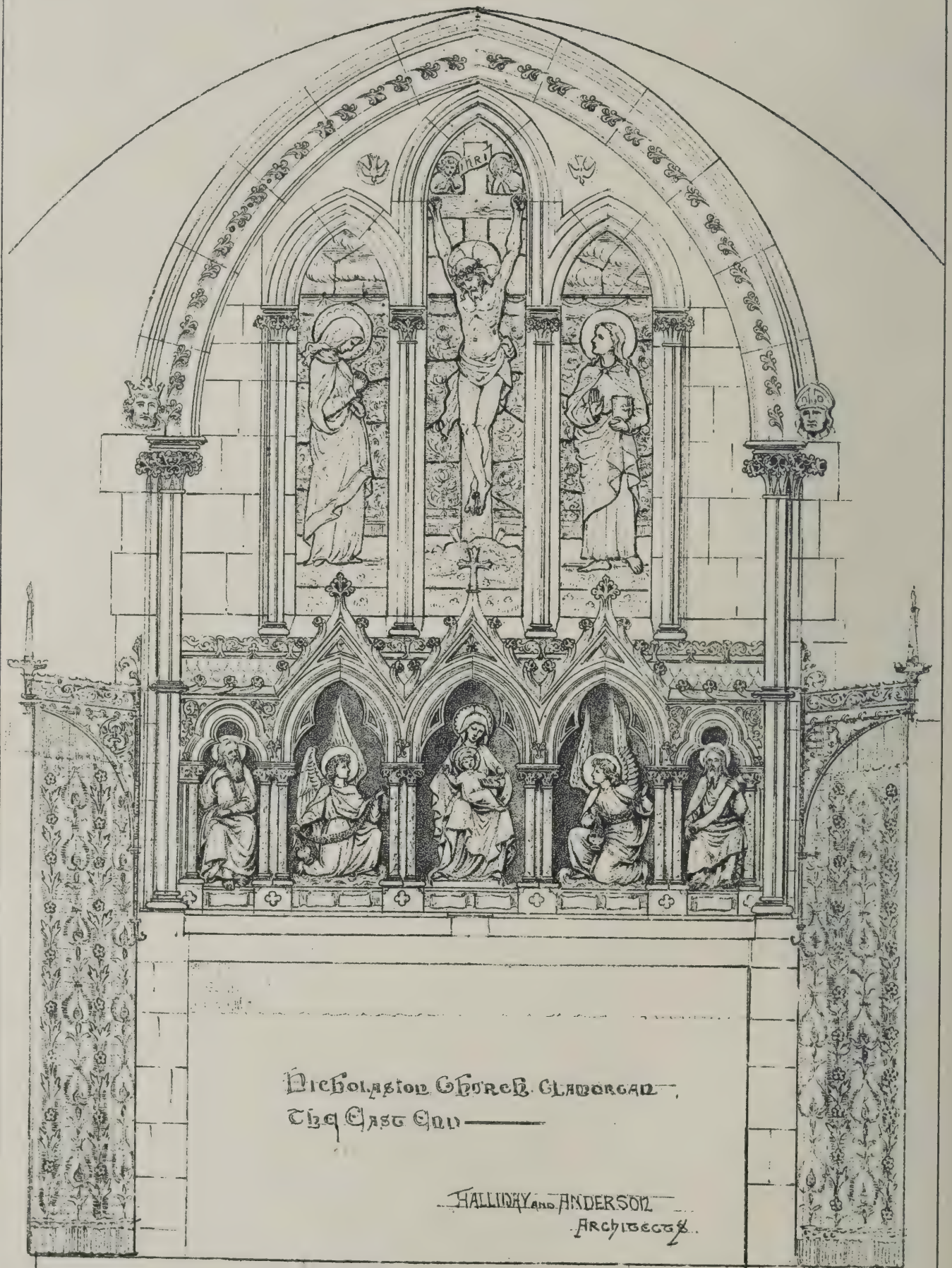
The Board of Trade Journal gives a gloomy look-out of the condition of trade throughout the country, in the course of which it is remarked:—"The building and cabinet-making trades are the only industries that may be considered as at all prosperous, but the former branch of industry is gradually becoming worse."

The contractors for the extension of the Highland Railway, Messrs. Lucas and Aird, of London, began operations on Monday with the last section of the new through line from Inverness to Cullodich—that is, through the estate and battlefield of Culloden, and across the river Nairn, over which will be thrown one of the finest stone viaducts in Scotland—to the point where the Strathnairn contract, which is now being vigorously carried on, terminates. This part of the contract amounts to £117,295, and with its commencement the entire works of the new through line are now in process of construction.

At the last meeting of the London School Board, a long debate arose out of a recommendation from the Works Committee for the addition to the offices of the board, now being enlarged from Mr. R. W. Edis's designs, of a clock-tower and clock, at an estimated cost of £3,000. It was stated, in the course of the discussion, that £220,000 had already been expended on the offices and site, under three architects. Eventually the matter was referred back to the committee.

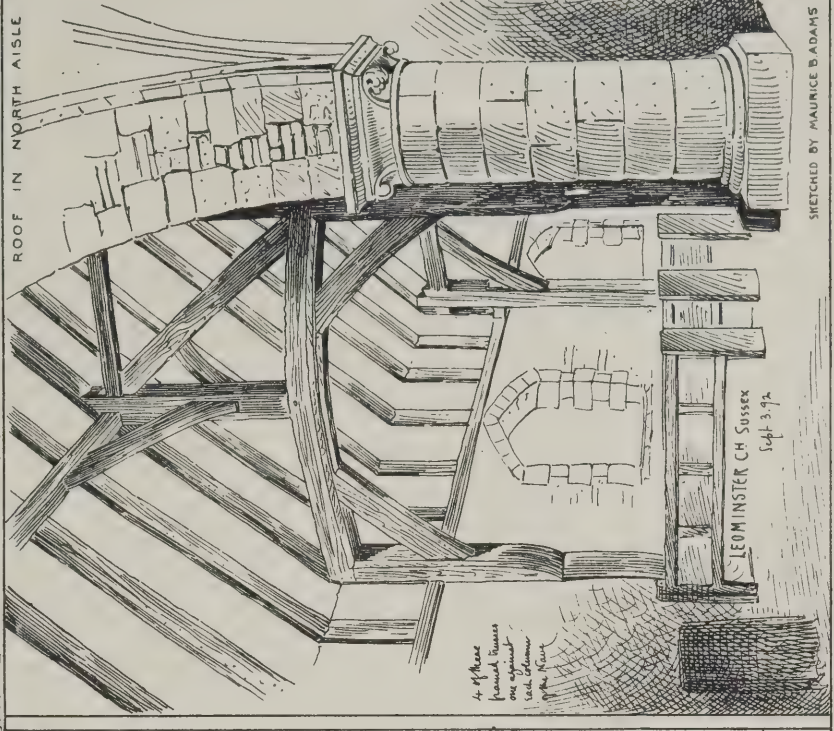
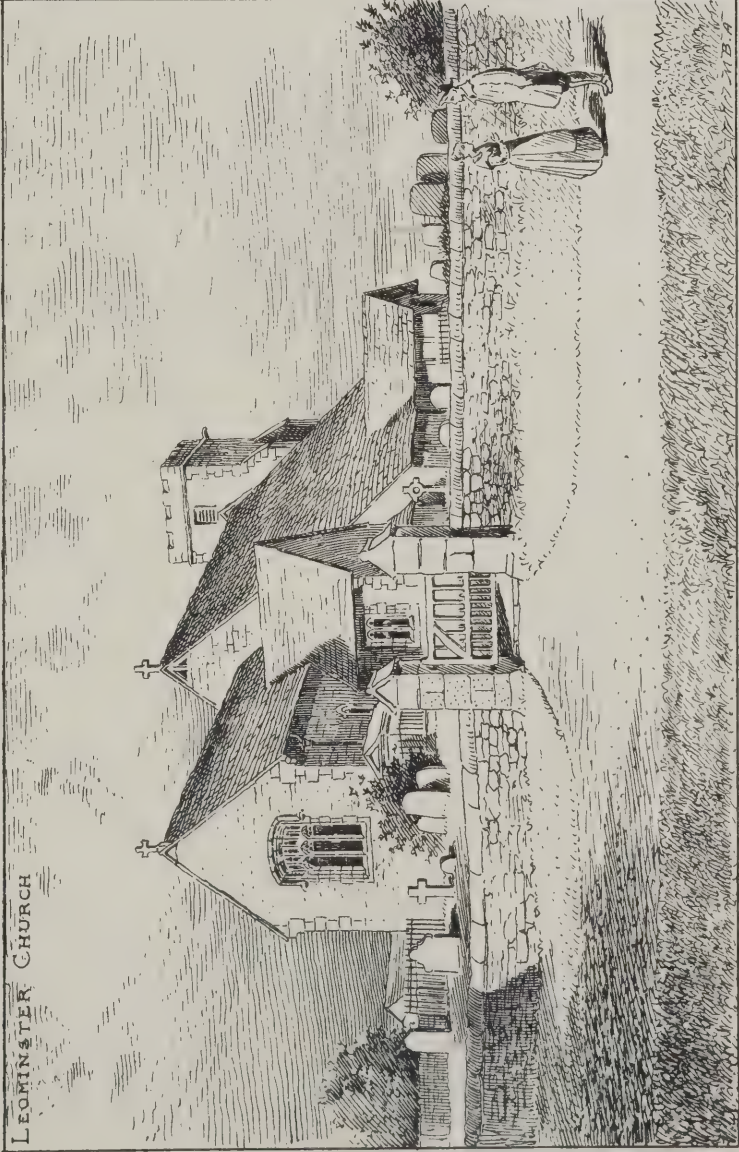
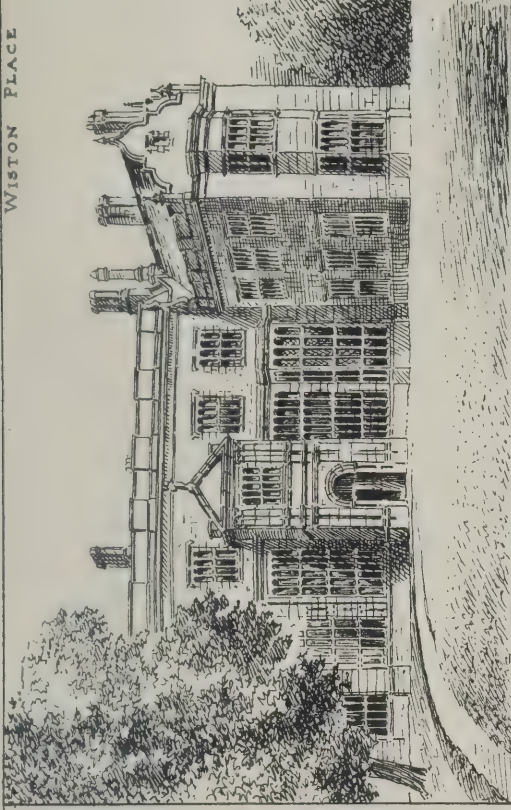
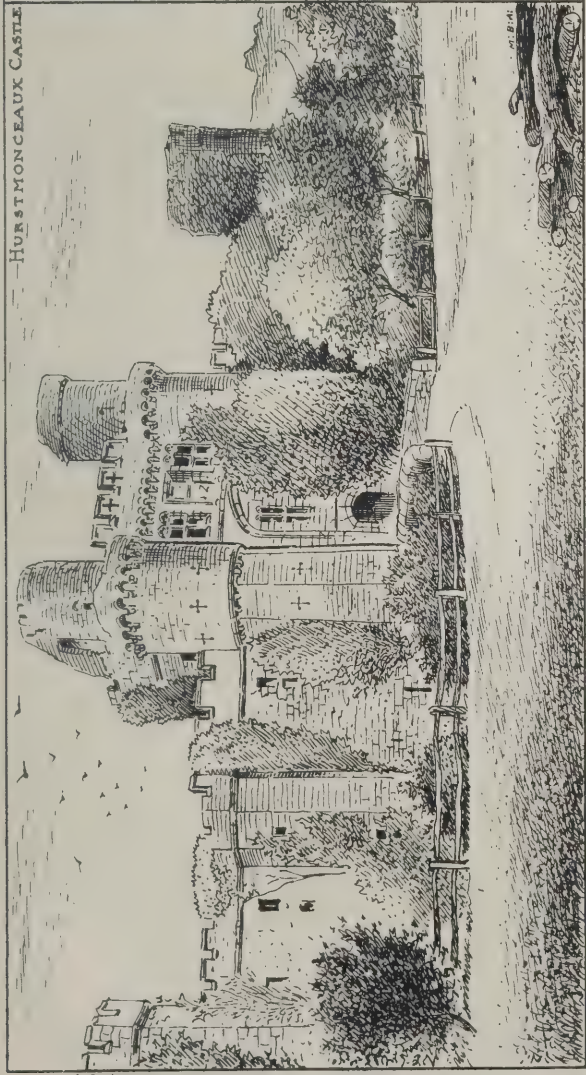
The Handsworth School Board, at their last meeting, decided to make several important alterations and additions to the Boulton-road schools, and appointed Mr. J. R. Nichols, M.S.A., architect, of 59, Colmore-row, Birmingham, and Handsworth, to prepare the necessary drawings and estimates.





Diebolaston Church, GLASGOW,
The East End

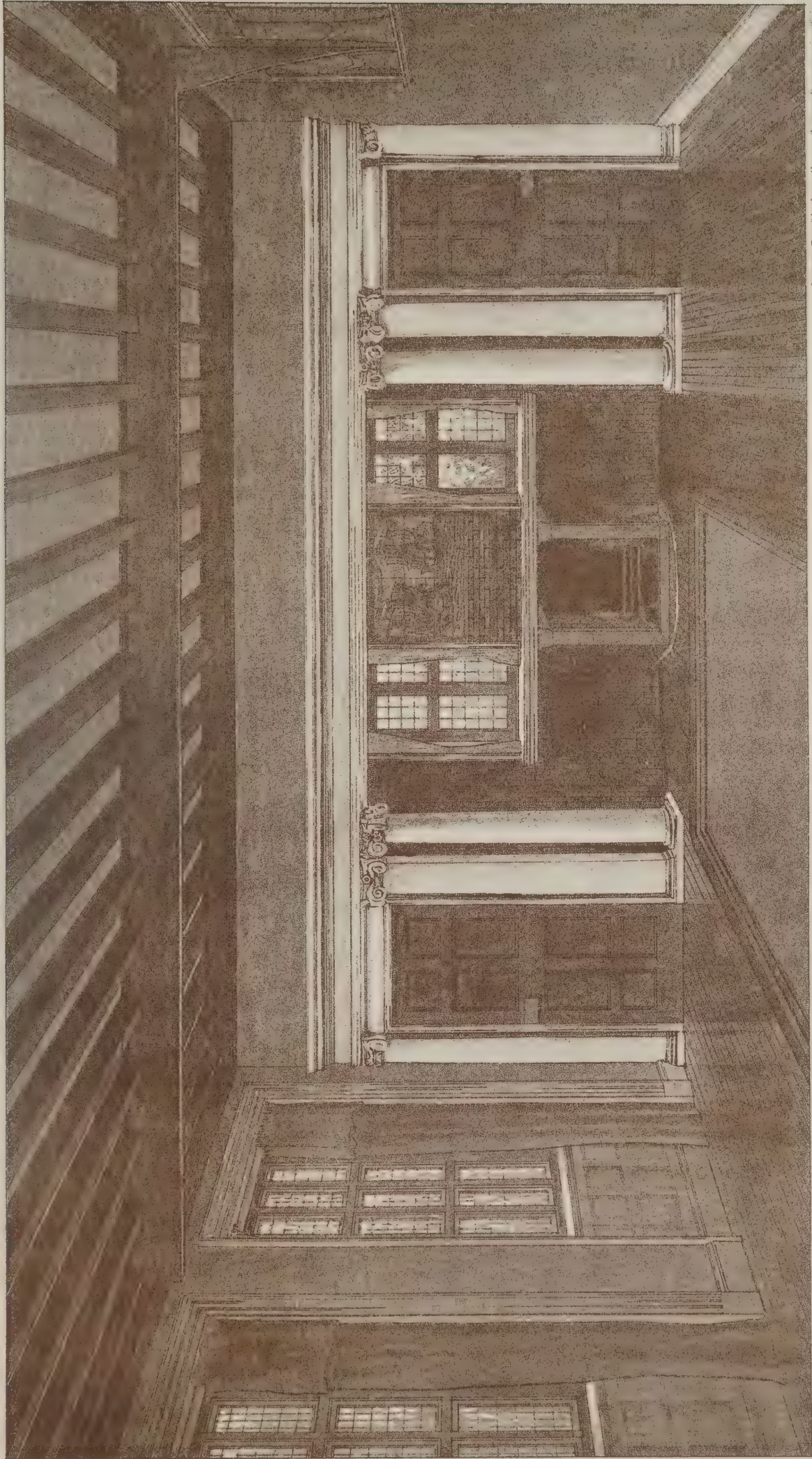
HALLIDAY AND ANDERSON
ARCHTDS



SKETCHED BY MAURICE B ADAMS

Photo Lithographed & Printed by James Alderman, 6 Queen Square, W.C.

THE BUILDING NEWS, NOV. 18, 1892.

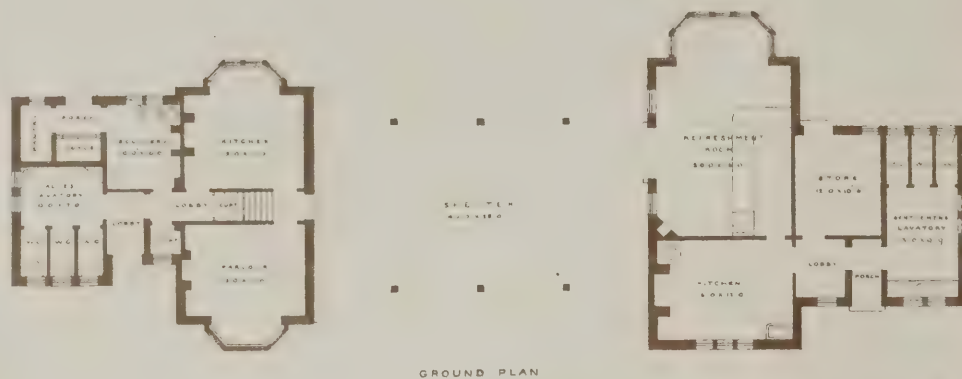


"PHOTO-TINT," by James Akerman & Co., 15, Queen's Square, London, W.

END OF BILLIARD ROOM · "FOXOAK" · SURREY · HALSEY RICARDO · ARCHT

NEW PAVILION PALMER PARK READING

WM RAVENSCROFT ARCHT



CANADIAN SUMMER COTTAGE

ERNEST WILBY ARCHT



Ground Floor Plan



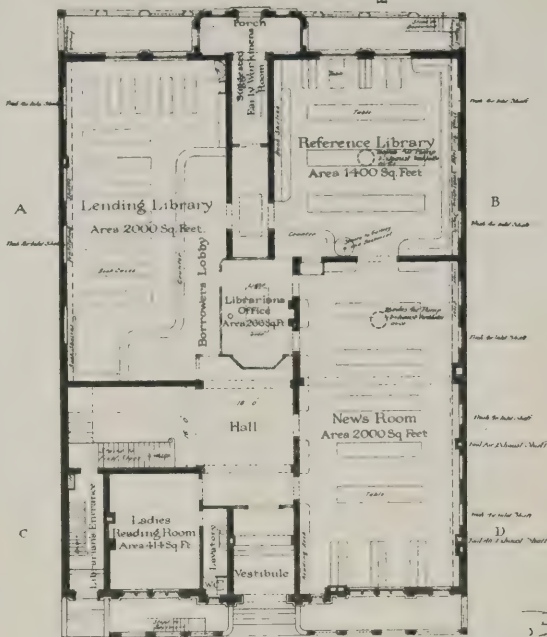
First Floor Plan



"PHOTO-TINT" by James Akerman, 6, Queen Square, London, W.C.



ECCELESTON PLACE.

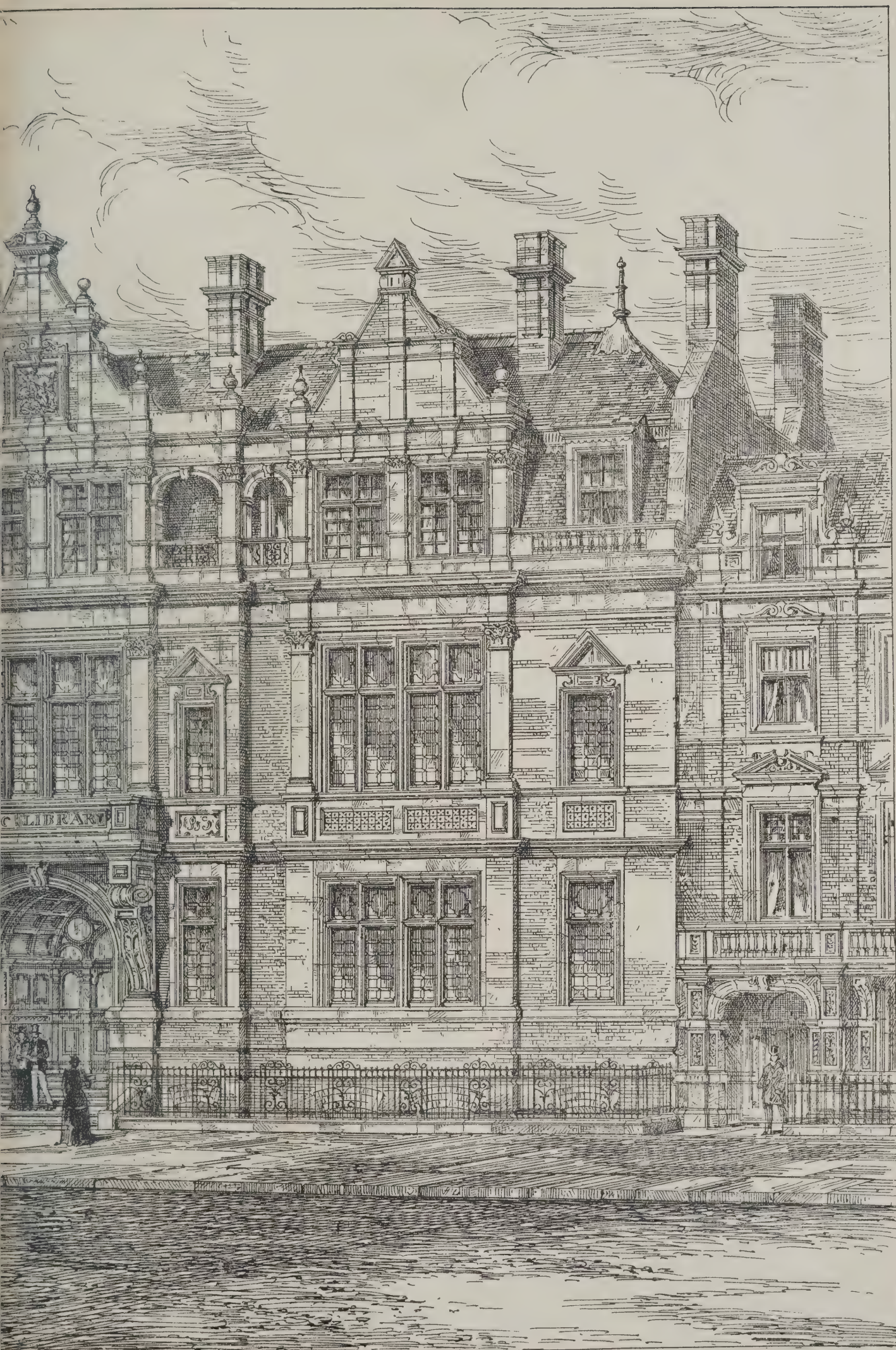


BUCKINGHAM PALACE ROAD

Ground Plan.



S. GEORGE, HANOVER, SQUARE
PUBLIC LIBRARY
BUCKINGHAM PALACE ROAD
A. J. BOLTON ARCHT.



THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXXIII.—No. 1977.

FRIDAY, NOVEMBER 25, 1892.

"THE STICKIT ARCHITECT."

READERS of Scottish novels have often made acquaintance with the "stickit minister." Trained, up to a certain point, with the view of occupying a pulpit in the kirk, he has somehow failed to secure one. He may have been unfit, and he may even, in certain cases, have been too good. So it is with the "stickit architect," who is even commoner in England than is his ecclesiastical brother in more northern latitudes. On a large building committee there is sure to be a "stickit architect," under some disguise or other, and the stronger the reasons for which he stuck fast, the harder he is likely to be on those who are more fortunate. His fellow members consult him with the natural readiness of men who see the chance of getting professional advice without paying for it. When words of wisdom fall from his lips, they feel that they are the opinions of an architect, and they forget that they are the words of a "stickit" one. The result is that he receives more deference than he deserves, and that his power for mischief may be out of all proportion to his real importance.

A. was an architect of the partially-"stickit" type. He had begun life as a designer of gin-shops and a planner of small public-houses; and this, to some extent, he remained to the last. Experience showed him, however, that hard work was less profitable than hard swearing. In arbitrations and compensation cases there is a steady demand for witnesses, and the demand naturally produces the supply. Here was an opportunity for A., as there is for many others like him. When a railway company and a landowner differed about the value of a property to be taken, and when one side put it down at £50 and the other at £5,000, A. was prepared to give evidence supporting either party, as accident might determine. With an imposing presence and a profound faculty of adapting his views to the needs of his clients, he became a successful man. Hard swearing about the value of land and houses has money in it. Hundreds of people require it who never require architecture or art in any form, so that an unblushing witness with some professional training is worth his price. A. consequently became a prosperous man. He still called himself an architect, and people who did not know the nature of his business supposed him to be so. And he was not without some ambition to deserve the title. Now and then he engaged in a competition; and though he never gained one, he did on a certain occasion what answered his purpose even better. He was connected with the promoters of an important building; he submitted a design for it; and when his design was rejected, his friends consoled him by giving him a chief place on the committee. There is no need to detail his revenge. The position of the successful competitor may be imagined. His work was turned into a fight for life. If A. could not produce architecture himself, he had learned enough to know when anyone else was producing it, and he used his knowledge to much purpose. To every satisfactory point in the accepted design he was a deadly foe. He advised alteration after alteration, each more ruinous than the last, and finally he managed to deal his rival a blow on a matter of construction. He affected to believe that the lower part of the building was too weak to carry the superstructure. He got the

matter referred to an eminent architect, who had not seen the foundations put in, or the bottom of the very massive walling built. This gentleman had everything to lose if the work gave way, and nothing to gain if it stood fast, and he was supplied with calculations which made it seem weak where it was really strong. The natural result was that, without pronouncing against it, he did not speak of its strength with absolutely boundless assurance. A. seized upon this circumstance, worked on the fears of his fellow members, and got them to insist that the work should be, as he termed it, "strengthened" before it was carried any higher. His "strengthening" consisted in building up £200 worth of perfectly useless brickwork against the previously built walls. It carried nothing, it buttressed nothing, it was a mere dead weight on the foundations; for all the aid it gave to the building, it might as well have been put up in Patagonia or Kamskatcha. But it served A.'s purpose. It helped to discredit the successful competitor, and after that, when anybody remarked that he had erected a novel and, on the whole, "successful building," somebody else was sure to answer, "But don't you know he made the tower so weak that hundreds of pounds had to be spent in strengthening it?"

The "stickit" architect, however, does not always employ himself in trying to make other architects stick. There are good varieties of him as well as bad; and not a few "stickit" architects have possessed more ability than the majority of successful ones. B. was a man who gained competition after competition, and who gained them by undoubted merit—a man whose advice was sought, and whose criticisms were respected throughout his profession, yet he ended without a practice what might have been a most brilliant career. This was due in part to bad luck as well as to bad treatment. For one reason or other, his competition designs, though they gained the first place, were never carried out. When other men are victorious in struggles of this sort they are generally left in peace to execute the schemes they have devised. It was not so with him. Sometimes he merely received the first premium, while the plans which had obtained the second or third one were those actually adopted. Sometimes the competition fell through, and a second one was arranged, with the effect of excluding him altogether. The designs which he made for non-competitive works were admired, but not accepted; or if they were accepted, the building was pretty sure to be abandoned. The fates seemed to be against him. His own executed works scarcely amounted to half a dozen. He assisted more fortunate men, and his best ideas—sadly distorted, but still notable—went to build up the reputation of architects not worthy to be named in the same day with him. It was a melancholy and an exceptional case, not easily to be accounted for. His powers were far above the average; his faults were a tendency to underrate the importance of convenient planning, and an inveterate habit of calling a spade a spade. This last peculiarity involved him in quarrels with his clients, and they were not, as a rule, over-scrupulous about the means they employed in order to get rid of him.

It is pleasanter to remember in how many cases the "stickit" architect has grown into a successful man. One of the best, if not the very best, of living novelists was trained to our profession, and the truth with which, on occasion, he describes any feature of an old building which may happen to come into his story is startling from its contrast with the common literary practice. Amongst those who began as architects, but who did not long remain so, we may also name one of our best living poets, who, like some poets of the Italian Renaissance, has worked to

good purpose as a maker of other things besides rhyme. Painting has employed many a "stickit" architect whom she has had no cause to be ashamed of; the subordinate arts allied to our own have been almost brought back to life in recent times by men with an architectural training, and even the drama could ill have spared some distinguished performers who were recruited from our ranks. Why did men of so much ability leave us? No doubt there were many reasons. Architectural renown is a thing of slow growth, and some of them saw shorter cuts to fame. An architect, again, may live and die with his imagination full of grand ideas, which, for want of opportunity, have never been made public. It is of no use for him to dream of a cathedral, when his clients want a factory or a model lodging house: he must build what is needed, or nothing at all. The painter and the poet are not limited in this way. What is in them they can bring out; and their finest thoughts have not to lie dormant till this work-a-day world chances, if it ever does chance, to call for them. The artist, too, may be very strong in a man, and the calculator, the planner, and the constructor very weak. It is natural enough, in that case, that he should find more congenial employment in painting or decoration, or even in literary work. But wherever he may ultimately place himself, his short architectural career will have done him more good than harm; and he may finally see that it was an indispensable preparation for his success.

CLAIMS FOR FEES.

ACTIONS brought to recover fees for the preparation of plans and for superintendence often turn on questions of expense or negligence. No doubt these are the two chief points which architects have to mainly guard against in their dealings with clients. The plans submitted are too expensive to carry out for the sum which the employer proposes to spend, a fact which becomes evident when the tenders are received. Or the work is proceeded with, and the employer refuses to pay on the final certificate, on the alleged ground that the plans and specifications have not been properly carried out, or that the architect has failed from negligence, and his fees are consequently disputed. Two recently reported cases have shown the risks and liabilities to which architects are exposed. In one of the cases brought before the Newport County Court, an architect claimed for fees for plans and superintendence in the erection of houses. The defendants brought a counter-claim for alleged negligence on the part of plaintiff. The latter prepared two sets of plans, the first set being too expensive, and the new set was made for houses which were not to exceed £600 each. The defendants were, it would appear, satisfied with the new plans, and tenders were obtained, one of which was accepted. It is stated also the architect gave a certificate to the effect that "in his opinion the work was satisfactorily completed," but from the evidence reported it appears there was some doubt about this even in the plaintiff's mind, as he wrote to defendants saying he was willing to refuse to give a final certificate if the defendants would indemnify him against legal proceedings. Some time after a deputation from the Master Builders' Association waited upon him, and on the same day he gave his final certificate after examining the plans, specifications, and estimates. A subsequent report we have received shows that professional witnesses had confirmed the plaintiff's action in giving a final certificate. There were certain items in dispute, the thickness of the mullions of the windows, &c.; the evidence called for the defendants proved certain defects, and the Judge, after hearing evidence for the plaintiff, said that the plaintiff had given

his certificate improperly, and had altered his views. Judgment was given for the plaintiff for £12 11s. 6d., and also for the defendants on the counter-claim, evidence to be given as to the amount. It is needless to say anything on the merits of this case, the details of which are not very clear, except as to the importance attached to a final certificate. As far as we know, the defendants received full value for the money expended in the houses; and the evidence for the plaintiff proved that he had not been negligent. An architect is often in the difficult circumstances of being between two fires; his client looks to him to refuse a final certificate till every item of the work is fully complete; on the other hand, the contractor threatens to take legal proceedings against him if he declines to give one. The architect, of course, ought to be the judge in the matter, and use his full discretion under the circumstances. It does not answer to exhibit any vacillation. If he thinks the work is not fairly completed by a certain day according to the terms of the contract, he should refuse to give a certificate, even under threats. On the other hand, an architect must make up his mind to use sufficient discretion as not to appear to put any trifling excuse in the way of granting a certificate when he thinks the work is fairly complete. To establish a claim for fees, an architect has to be very cautious. He must be able to resist any counter-claim brought by the employer for alleged negligence, and therefore he must show that the work has been satisfactorily carried out to the full meaning and intention of the plans and specification, and especially that no defects of a serious kind exist. Unless he can do this, he had better pause.

In another case, at Crewe, an architect sued for fees amounting to £18 12s. for plans and sketches for a house that had been erected by the defendant from plans by another architect. There was some doubt as to the contract between the plaintiff and defendant. For the former it was alleged that he had taken plans for the defendant's approval, and at his request had made a sketch of a house at another place. The defendant had made suggestions for certain alterations, and fresh sketches were prepared, and levels of site were taken by the plaintiff. The defendant appeared satisfied, but subsequently employed a local architect, alleging that he thought he would give more attention to the work. Plaintiff was awarded £5 for his services. In this instance it was stated the plaintiff had called upon the defendant and asked for the job. The facts as reported require little comment. An individual who contemplates building is not indisposed to look at designs which may assist him to form ideas of his own. It sometimes happens that an architect has done something of the kind before which may be of service, and may feel very anxious to bring it to the notice of the person about to build; perhaps oftener it is regarded as a good "stroke of business" to introduce one's self. In country towns the practice is by no means uncommon; the plaintiff did as hundreds of others do, and his *quasi* client probably derived some advantage, and at least so far entertained the proposal as to ask the plaintiff to submit to him a sketch of a house, and made some suggestions which were apparently acted upon. All this trouble may, however, be sometimes thrown away upon an owner who has not quite made up his mind. At least, this much may be said generally as applicable to all such cases. An architect who calls upon a person unsolicited, and brings him designs he had by him for approval, cannot plead a retainer till some instructions are given to him, or certain acts done. Such a retainer would be found in any instructions given by the owner as to alterations, and it is upon such ground a

claim is often made. Many architects are in the habit of calling upon individuals who are thinking of building, and submitting plans for their inspection; but until they obtain any verbal or written instructions or requests from the owner, their services are likely to go unrequited—to say nothing of the professional etiquette of such a course.

ARCHITECTURAL ASSOCIATION.

THE second ordinary meeting for the present session of the Association was held on Friday evening, the President (Mr. H. O. Cresswell) in the chair. Messrs. O. G. Crockett, O. Little, J. Newnham, and G. H. Allison were elected as members.

SOME MYSTERIES OF MODERN ARCHITECTURE.

A paper on this subject had been written and forwarded by Mr. PAUL WATERHOUSE, M.A., who was, unfortunately, laid up by an attack of bronchitis, and was, therefore, read for him by the President. The author said he proposed to look at some of the points relating to architecture and its relation to other arts. The prefatory question, "What was architecture?" was not a conundrum; if it were, there would probably be an answer to it, but there was not—at least, there were several replies, which, for logical purposes, came to the same thing as leaving the question unsolved. The best reply was a negative one, showing what an architect was not. An architect was not a man who was ignorant of the principles of construction or of the elements of drawing; he was not a man who knew nothing of the history of great buildings in the past, nor of the requirements of wholesome buildings at the present; he was not a man incapable of comprehending the ingredients of design. Here was the *raison d'être* of such tests as architectural examinations. A great many of the enemies of examinations, and possibly some of their warmest but not wisest friends, considered that they were regarded as conferring, when successfully passed, a diploma of qualification. This was a great mistake, for examinations were not a golden key, but a sieve. If a man squeezed through he showed that he was not of so gross a clay as to be absolutely unfit for the function in life to which he aspired. But to say that all who successfully passed these examinations were thereby duly certified as complete and efficient architects, was, under any system of examination, impossible. It might be said by some that an architect, like a poet, was born, and not made; but it was of some practical necessity even to a poet to be taught a language and the use of A B C. As to the controversy, was architecture an art or a profession? if either of these terms could be logically defined, which the author doubted, architecture would be found to be both. A tenet in Greek philosophy proclaimed that man was a compound of the beast and the god. Were he purely divine or purely animal he would cease to be man. This analogy applied to architecture, which was allied, on the one hand, to the fine arts, and on the other to those industries whose function was to supply the apparatus of life and comfort. One of the first duties of architecture was to minister directly to the physical requirements of man. It had an element in common with all other arts, namely, the undefinable but well-understood element that it was an art; but its first, or normal, function was the application of that element to the otherwise purely utilitarian process of providing man with a dwelling. It was sometimes said that there were two kinds of buildings: those that had architects and those that had not, and it had been contended, even by a well-known authority, who ought to have known better, that an architectural building differed from a non-architectural in being, among other things, more costly. But the author contended that every building required, and for that matter had an architect. The architect might be consigned to oblivion under the guise of a salaried (perhaps a low-salaried) clerk in a speculative builder's office, or he might be reft of his credit by a usurping client, who said: "I designed my own house, you know; just got a draftsman fellow to put things together, but I settled it all myself." But for all that, some one brain must conceive and contrive the building, or as an edifice it would suffer, if only through the waste of material. It being conceded, then, that every building, however small and cheap, had an archi-

tect, buildings might be divided into three broad classes. In the first class were the buildings best described as monumental. In the next were the domestic (use the term widely), and in the third the utilitarian, which had to fulfil a useful end at the least possible outlay, and it was not derogatory to R.A.'s that dust-bins and pig-sties had been designed by members of the Royal Academy. The highest class—the monumental—in the scale contained buildings of public importance of all kinds. In these it was of prime importance that the details of the architecture should conform to a recognised style; and for this reason it was generally allowed that they should be produced by men who had made a professional study of style. In the intermediate class—the domestic—a greater liberty was allowed in the matter of design, and, alas! still more liberty was often taken. It was in this class of work that the public most readily adopted the error that an architect's building means a building in the construction of which they paid a professional gentleman to make it more expensive than it need be. An architect in this aspect ought to be one who combined the artistic and economic arrangement of his client's wants. The client stated his requirements, the architect solved his problem, or he had also to enlighten his client as to what was really wanted, or what he ought to want. There was a fourth class in which a wealthy client gave absolute *carte blanche* to the designer. Most architects longed for opportunities of this kind, but until they came he doubted if they realised the blessedness of the restrictions under which they usually worked. Restrictions were not the curse, they were the blessings of architecture, and here was one of the mysteries of architecture. If a client removed all restrictions, what was to be done? Why, it was left to the architect to make his own, and then they saw what stuff he was made of. Where would he admit, and where omit enrichment? Where would he extend, and where compress his accommodation? Where would he use his costly materials? Where would he decide that they were out of place? Where would his elevations be exuberant? Where would he keep them quiet? Nothing could guide him but his artistic sense, and if this were absent, the architect would succeed, no doubt, in assisting his client to break a record for outlay; but would he, by virtue of his opportunity, have been able to put himself ahead of his brothers in art who were not blessed with such liberal patrons? It was a melancholy fact that few would show their best talents in a case of *carte blanche*. Passing on to consider another point, Mr. Waterhouse asked whether the best architects were those whose works were most appreciated by the general body of the enlightened and educated public, an inquiry which he thought must be answered in the negative. He would go further and assert that at no period was there an intelligent public taste in architecture, not even in the 13th century or in the best period of Greek art. For example, in the many works that remained to us of the general and philosophical literature of Greece, there were nothing more than general allusions to architecture, and hardly any references to these principles which underlaid its successful development in the country. Take Plato and Aristotle, writers who made it their very business to analyse the arts and their functions; what had they to say of architecture except in the most vague and general way? Until in the writings of the great thinkers of Greece they could show some evidence that they knew more of architecture than the difference between Doric and Ionic—then and not till then would they be able to entertain a belief that the very considerable intricacies of the seemingly simple Greek architecture were the more or less common property not merely of recognised specialists, but of the general body of citizens. But even, Mr. Waterhouse continued, any exceptions, and even the rare instances in our own country of amateurs who become architects, sometimes to the great disadvantage of the art with which they thus coquette, will not disprove the general truth of the statement that in all ages, even in those where by some coincidence the public taste encourages for a short period the really best class of work, and perhaps, especially in the present day, architects have not dared and do not dare, to listen for approval or for condemnation to the public voice. When we sit at our drawing-boards, using alternately india-rubber and pencil over some half-developed elevation, to whom is it that in our inmost

consciousness we appeal as arbiter? To our own eye in the first place; perhaps (and this is a fallacious, but not unknown, tendency in the case of competition works) to the supposed taste of the assessor, and often to the general body of our professional brethren, present and future; in many happy instances we have a thought of our clients' approval, but of the public taste—never. But, after all, it will be argued, it is the public who choose architects, and consequently it is the public who decide to whom shall be given the greatest amount of work. They sometimes call, in cases of competition, a member of our own profession to assist their selection, but even in these cases they reserve the right to fall back on their own opinions as to which of the competitors supplies the best design. This is one of the mysteries, not of modern architecture only, but of our profession at all times. Our beginners have not the same opportunities of starting practice on their own merits that are accorded to novices in other arts. The young painter and the young sculptor making experiments at their own expense, and with a comparatively small outlay, chiefly of time, by means of exhibitions acquire the notice of the public who are to become their employers. But what can an architect student do to win the confidence which is so slow in coming? He can compete for architectural prizes—that is, for the rewards annually offered for designs on paper; but success in such competitions, even if it implied (which it does not) the power to bring an actual building to successful completion, is not equivalent to notoriety. A place—even a place near the ceiling on the walls of the Royal Academy—is a better thing for the commercial prospects of the budding painter than the winning of the Soane Medallion, or even the Academy medal, is to the professional welfare of an architect, though it represents a lower stage in the range of art. Architects have to make their beginnings, and even to practise their failures at other people's expense; and thus, unless an untied man wins a competition, or has a little spare cash with which he can build himself a suburban residence as a sample, he has nothing but drawings to show as specimens of his capacity. In other words, a painter or a sculptor gives the public some security, some guarantee. The architect, on the other hand, asks his first client to spend without security, and even if he were to forego the amount of his commission, this would not, in the event of failure, compensate the client for his outlay upon the building which had gone wrong. And now allow me to conclude with a few reflections on that most mysterious matter, the matter of progress. It is obvious that we architects differ very greatly from one another on the very ground that we often take widely different views on this very vital question—the aim of our art. To some men, clearly the idea of progress represents origination in the form of novelty. Architecture in their eyes is first and foremost a creative and an inventive art, and they resolve to mark their own footprints by casting aside the things of the past, and by being original at any cost. Another school, realising the daily advance in our scientific knowledge, and the consequent increase in our acquaintance with the properties of materials, feel that architectural progress is embodied in the adaptation of the needs of a building of all the newest opportunities which an ever-broadening science lays at our command. A third group, feeling that architectural beauty is largely a matter of association and tradition, look to a complete knowledge of some phase or phases of extinct art as the true solution of our modern problem. Hence we have side by side three bodies of workers, differing not merely in the degrees of capacity, but in the radical divergence of their views on the fundamental aim of their work; there may be three men, all honest workers, all men of talent, all men of moderation—one will be a pioneer of originality, one a leader in constructional novelty, and the third, stickler for precedent; there may be three others who are failures, but on the same lines of classification—one an outrageous innovator, and the other two respectively a hopeless utilitarian and a barren antiquarian. Each has only to accelerate his pace to accelerate his ruin. Is, then, the mystery of progress in architecture insoluble? I think not; but we had better help ourselves to its consideration by another appeal to a metaphor—to the metaphor of language. The whole art of language is not to produce one class of composition only; but it is rather an intel-

lectual equipment, fitting its possessor for a variety of productions in various departments. Thus it is with architecture. While in every individual design the architect has a particular object in view, the art, as a whole, has a different, a wider, a more general object, the achievement of which is the aim of the art, and the road to which is the road along which progress is marked. Architecture is a means of expression, in which we have both poetry and prose; and the prose, as in literature, may be dignified no less than the verse—in fact, to be good prose it must be dignified. The purpose of architecture is expression—genuine expression; generally serious, not always solemn, but never flippant; and thus the aim of architecture is facility of expression in whatever mode the particular case demands; and in so far as this aim is approached progress is obtained. And what is the recipe for this royal road of progress? First, study of past methods; secondly, study of present needs; and, lastly, practice. Our own motto is a worthy guide—"Design with Beauty, Build in Truth"; but our motto is of little use to us if we have no means of asking and answering the questions "What is Beauty?" "What is Truth?" Our art has many mysteries—not fewer to-day than in the days of old—and these mysteries, if we wish to know beauty and truth, are worth something more than an evening's consideration.

At the close, votes of thanks were accorded to the author and reader of the paper, on the motion of Mr. LEONARD STOKES, seconded by Mr. F. R. FARROW, and supported by Mr. HAMPTON W. PRATT.

EXHIBITION OF DOULTON WARE.

AT Messrs. Doulton and Co.'s show rooms, on the Albert Embankment, the memorial statue of the late Professor Fawcett, M.P., presented by Sir Henry Doulton, to be erected on the site of "The Lawn," Vauxhall Park, where the former Postmaster-General resided, is on view. The group, of terracotta, has been designed and modelled by Mr. George Tinworth, and has a total height of 16ft., including the pedestal, which is 7ft. 6in. high, and 8ft. by 4ft. at the base. The figures are of colossal size. Professor Fawcett is represented seated on a chair of Greek type, in academical robes; behind him is a figure of "Victory" with wings extended, holding a wreath over the head of the politician. Round the four sides of the pedestal are eight bas-relief panels of figures in terracotta, emblematical of Professor Fawcett's career. In the narrow side in front is "Courage," in the rear "Justice." On each side are three panels, representing on one face of pedestal, "Sympathy," "Courage," and "Truth," and on the other, symbolical of his work as Postmaster-General and Indian affairs, "Receiving Good News"—a female Post-office clerk—"Receiving Bad News," and "India." The likeness of the political economist is good, and the attitude meditative. The terracotta group in a buff tint is rendered more agreeable by the variety of warm tones due to the firing.

Not the least interesting part of the exhibition is the splendid collection of objects of Doulton ware, Lambeth faience, Burslem china, Carrara silicon, and other art productions intended for the Columbian Exhibition at Chicago, displaying the resources, technical and artistic, of Messrs. Doulton's potteries. We can only mention the fine vases in Lambeth faience painted by Miss Florence Lewis, unfired, in which palms, cacti, and other plants are introduced of a rich yellow ground; a pair of Doulton vases on pedestals, with etched designs of horses round the bodies, painted by Miss Annie Barlow. The magnificent pair of ewers in Doulton ware by M. V. Marshall are extremely elegant in design, and of a free decorative character in the modelling and colouring. Another pair of vases of bold folial design, with eagle handles and lizards in relief round the neck, and a centre vase of ewer shape by M. V. Marshall, are remarkable for their boldness and originality of conception, and the rich browns and blues of the material. The Perseus and Andromeda vase, with underglazed painting by Mr. Eyre, may also be noticed. A splendid case of Burslem china is on view. The double Goethe vase, representing Marguerite and Mephistopheles, is a dexterous and clever illusion, the former being always accompanied by the latter, which is reflected on the mirror. Some exquisite pieces, painted with animals and birds by G. White,

Wilson, and Mitchell, are amongst them. Mr. G. Tinworth's vase, illustrating the history of England, is clever. We also draw attention to a few painted panels by Esther Lewis and John Eyre, particularly to a figure of angel for church decoration designed by Mr. J. F. Bentley, painted by Mr. McLennan, in a dry impasto style, excellent in colour; and to a case of Crown Lambeth ware, containing some very beautiful examples of painted vases, and some charming figures of children in picture panels by Miss Dennis. The collection is well worth a visit by all lovers of artistic faience and pottery.

THE DUDLEY GALLERY.

THE New English Art Club has opened its ninth exhibition this week in the old Dudley Gallery connected with the Egyptian Hall, and the work shown, though marked by the same extravagant character, is by no means so interesting or so numerous as on some former occasions. Many of the studies have been intentionally made to fit old worm-eaten and dirty gilt frames, the key of the subject being so rendered as to harmonise with the decayed frame to which it has thus been adapted. The canvas-covered, mud-bedaubed frames of previous years are growing out of fashion seemingly with the members of the New English Art Club, and, consequently, old frames are likely, in confined centres, to be at a premium. However Mr. John Ruskin can bring himself to exhibit a drawing ("Dawn-Coniston") midst such a medley is past our comprehension, after his uncompromising attack, some years ago, upon Mr. McNeil Whistler, who here may find many excessively poor imitators.

Some of the pictures, if such they deserve to be called, are clever enough in the matter of trick and oddity; but for grace of drawing, beauty of colour, or healthy vigour of design, hardly one merits mention, where capable aspirants after fame have gone wrong in their impatient revolt against the pot-boiling propriety of popular picture-painters of the Horsley and Frith school. Wanton ugliness and insipid caricature are, however, no substitute for true art appreciation; and high prices asked for hastily-dashed-off rough pallet-knife studies, do not make these productions lasting or living works of art. "Boulogne Sands," by Mr. P. Wilson Steer, in pastel, is figured at 50 guineas, and a similar sum is asked for his "Procession of Yachts." Miss A. Holland's "Brown Study" (also a pastel sketch), modestly marked at £6 6s., on the other hand, is good in drawing, harmonious in colour, true to nature, unambitious in aim, moderate in scale, and hung up so that it cannot be seen as it deserves—an oasis in such company, though merely a study of chairs and a table. Mr. Fred Brown has a lumpy landscape, with clouds actually modelled in oil colour; but for dexterous blending of reds, his portrait model study, called "June," has no equal in the gallery. The roses in the air are introduced regardless of anything save colour, and the massing of the dishevelled auburn hair of the girl, put on with the knife, is wrought with the same idea. The red of the frock completes the harmony. The same model serves for a more ambitious work by the same hand, called "Penserosa," but which is not a success, except for the handling of the blue delf ware on the chimney-piece. The crane tile panel behind the girl gives her an *en bon point* appearance. "Lingering Light" is a golden landscape, studied for tone, by Mr. Moffatt P. Lindner; and "The Chrysanthemum Girl," by Mr. R. A. Bell, shows a dancing fairy, incongruously surrounded by isolated flowers. Miss Barber's "Swinehard from Hans Andersen" is much more really unintentionally funny than Mr. Arthur Lyard's panel design, called "The Crime," which is conceived as "a grotesque," intended for execution in wood. It is suitable for neither. "Rain in the Heavens and Geese in the Pond" is the title of Mr. Francis Bate's £50 landscape—a curious price for a curious picture. It looks more like the map of a country. In a case are shown some silver-work from the Guild of Handicrafts.

ROBERT BOYLE AND SON, LIMITED.

THE seventh annual general meeting of this company was held at the City Terminus Hotel on the 16th inst., when a dividend of 12½ per cent. was declared, free of income-tax, for

the year ending September last, after placing to reserve fund one-sixth of the profits earned, and carrying forward £1,386 4s. 9d. This makes the seventh dividend, 12½ per cent. being paid for the last three years, and 12 per cent. for the previous years.

Mr. ROBERT BOYLE (chairman and managing director), in moving the adoption of the report and accounts, which were unanimously passed, in the course of his remarks, said: You have now before you the results of our endeavours to promote the interests and extend the business of the company. I am happy to state that the orders and contracts secured during the year, especially in England, are considerably in excess of the previous year, though that was the most profitable year since the formation of the company. We have also at present in hand a number of important contracts at home and abroad, including the largest ventilating contract we have ever received from the British Government, and one of equal magnitude for the Spanish Government. Though we have a registered capital of £120,000, it has not been found necessary to call it all up, and I do not think that that necessity is ever likely to arise, as our reserve fund, to which a sixth of the profits has been added each year, is now represented by a substantial and solid sum, and is a sure guarantee against all ordinary contingencies. You will be pleased to hear that it is anticipated that the dividend for the current year will balance the subscribed capital of the company, including the ordinary shares held by myself, when cent. per cent. will then have been paid. As the holder of over three-fourths of the share capital of the company, to which I have added as opportunity offered, I think I need hardly say that, personally, I am perfectly satisfied with these returns, which we have been enabled to attain through a constant study of, and careful attention to, the requirements of our clients, and by the improvements which have from time to time been effected in our ventilating appliances, especially the air-pump ventilator, the improvements protected by our latest patent having not only added considerably to its power as a foul air exhaust, but rendered it entirely free from down-draught and perfectly noiseless—a most important point. The ventilator is also made of a more ornamental character, of the best rolled steel plates, galvanised and enamelled, and though it is in every respect superior to all previous forms, it is now supplied at a reduction of 50 per cent. on our original prices, constituting it not only the most efficient and ornamental, but the cheapest ventilator in the market. It has always been our aim to bring a really reliable ventilator within the reach of all by selling it at the very lowest possible price consistent with the best workmanship and material, and it is only owing to the very large and ever-increasing business that we are now doing that we are able to supply our ventilating appliances at the prices we do. I regret to say that the profession of ventilation-engineering is being brought into no small disrepute through the deplorable conduct of certain unscrupulous persons, who attempt to foist upon the public utterly worthless appliances, the failure of which causes all ventilating and sanitary arrangements to be looked upon with suspicion and distrust, retarding the advancement of sanitary science, and bringing it and its professors into discredit. Architects, from the special knowledge they possess, are, of course, not so readily imposed upon, as they are in a position to discriminate between the counterfeit and the genuine; but the general public, who are inexperienced in these matters, and prone to believe that they are getting a bargain when they buy an article at a low figure that would be dear at any price, are but too liable to be misled by the specious and mendacious assertions which are made by these harpies respecting the merits of their particular contrivances and demerits of all others, not scrupling to resort to the most unprincipled practices to accomplish their ends. It is a pity, especially for themselves, that these misguided people are seemingly incapable of realising that after all honesty is the best policy in business, as in other matters. It has been found necessary during the past two years to make certain changes in our staff, which, I am pleased to say, have materially conduced to the more efficient conduct and welfare of the business, and enabled me to devote more of my time to the development of the company's interests abroad. My latest tour through "the East and Australasia" has been, as you are already aware, very successful, this being the fourth time I have

circled the globe with the object of promoting an increased interest in sanitary matters, and securing the adoption of improved sanitary arrangements. A narrative of the tour has been published in book form, entitled "A Sanitary Crusade through the East and Australasia," and concerning which I have received, expressing their cordial approval of and sympathy with the work we are engaged in, a large number of letters from distinguished people—leaders in the scientific, literary, and political worlds, including a most encouraging autograph letter from Lord Salisbury. The London and provincial papers have also, in a very public spirited manner, referred to the evils described in the book, and strongly urged the claims set forth therein for their alleviation and redress, all of which will doubtless bear good fruit in the future. Of course, our work in its connection with the health and consequent welfare of the people is of a strictly practical and business character, and we make no pretensions to disinterested philanthropy, which, to be of any permanent value, should, I think, be at least self-supporting; still, it is always pleasant to feel that whilst we are promoting our own interests, we are also conferring substantial benefits on others. In addition to the agencies already existing, and which we now have in practically every country in the world, I have during my recent tour established agencies in Burmah, Queensland, New South Wales, Victoria, South Australia, and New Zealand, and completed arrangements for the manufacture of our different ventilating and sanitary appliances in each of the colonies. Scientifically applied, automatic ventilation is now being, as elsewhere, generally adopted in the colonies, plain, open pipes and mechanical ventilation having been found to be as great a failure where employed as they have proved to be in this and other countries, of which the system in use at the new London Law Courts is a notorious example, though all that money and skill could do to make the mechanical ventilation a success has been tried. I have surveyed and submitted plans and estimates for the ventilation of the new Jubilee Hall, Rangoon; King of Siam's Palace, Bangkok; Government Buildings and Museum, Batavia; the Chicago Exhibition Buildings; Houses of Parliament, Centennial Hall, Municipal Buildings, new Hospital, and new Theatre, Sydney; Houses of Parliament, Stock Exchange, Commercial Bank and Bank of Victoria, Melbourne; also for the complete ventilation of the new drainage scheme, Melbourne. At Adelaide the new air-pump ventilators have been applied to the Houses of Parliament, Government House, Government Buildings, Supreme Courts, Post-office, Hospital, Art Gallery, Museum, University, and other public buildings. At Christchurch, New Zealand, the house drainage is exclusively ventilated with the air-pump ventilators, there being over 5,000 used for this purpose alone. Several thousands are also employed for the house drainage at Wellington, the air-pump ventilator being also applied to the Houses of Parliament, Government House, Government Buildings, Post-office, Supreme Courts, Hospital, Opera House, &c.

The retiring directors and the auditors having been re-elected, a cordial vote of thanks was proposed to the board for their services, and to Mr. Boyle for his admirable management of the company during the year. This was carried unanimously, and a vote of thanks to the chairman for presiding terminated the proceedings.

PUBLIC BATHS AND WASH-HOUSES. —IV.

By R. OWEN ALLSOP, Architect.

Author of "The Turkish Bath," and "The Hydro-pathic Establishment and its Baths."

SWIMMING-BATHS.

ON the 27th May, 1878, was passed an amendment to the Baths and Washhouses' Act authorising commissioners to erect and maintain covered swimming-baths at the maximum charges to bathers of 8d. first-class, 4d. second-class, and 2d. third-class. The popularity of the public swimming-bath has continued to grow, and with it size has increased. Baths considerably over 100ft. in length are now frequently required. The large swimming-bath at the recently opened Hornsey Public Baths is 132ft. by 40ft., while the women's bath is 75ft. by 25ft.

The popularity of swimming-baths, having made them a remunerative feature in public bath-

houses, has enabled commissioners to afford good accommodation. By contrast to the newest bath the older swimming-baths seem frequently very inferior. Several are a disgrace to London.*

At some of the older London baths—as Kensington and Marylebone—three classes of swimming-baths are provided. A better arrangement is two classes only, and, if there be a small, third bath, let it be for women. The second-class bath will be smaller than the first, and the women's bath again smaller than this.

Baths over 100ft. in length afford a good swim, but a width of over 40ft. is not desirable. An undersized swimming-bath is a very useless thing. As to depth, all practical purposes are served by baths giving a water-depth of from 3ft. 6in. to 7ft. for men, and from 3ft. to 6ft. for women.

The hall in which the swimming-bath is constructed must be so much wider than the bath according to the arrangement of the dressing-boxes, &c. The space required from the edge of the bath to the face of wall cannot be less than 7ft., and 7ft. 6in. and 8ft. are better. The depth of dressing-boxes will require to be 3ft. 6in. or 3ft. 9in., and the gangway in front must be 4ft. 6in. wide. A bath 40ft. wide, with a row of dressing-boxes on either side, therefore requires a hall 56ft. wide, although 55ft. may do. The length of the hall will depend on the arrangements made. If there be a row of dressing-boxes at one end, and the other end be left unobstructed—as is usual, and most convenient—a bath 100ft. long will require a length of hall 114ft., which will leave a 6ft. gangway at each end of bath for diving stages, toilet places, &c.

The dressing-boxes of a first-class bath will be 3ft. 9in. square in the clear, or of a width rather under 4ft. from centre to centre of wood partition. The second-class dressing-boxes are frequently made somewhat smaller.

In one or more of the angles of the hall are commonly placed the sanitary conveniences; but in many baths, when thus situated, they have been found a nuisance, and been removed further out of the way. The Richmond baths are a case in point.

In some first-class baths a cold shower bath is fixed for use of swimmers. A warm, or hot one would be more reasonable.

Most first-class baths are now required to have good galleries for the public on occasion of swimming entertainments, &c. They are generally carried on rolled iron joists as cantilevers over dressing-boxes, and continue usually round the sides of the hall. A strong balcony railing is required.

The diving-stages or spring-boards are placed at the head of the baths, and are made in various forms. The supports are mostly of cast wrought iron, and the boards of oak or ash, with slotted eyes, and covered with cocoa-nut fibre matting, to afford a foothold to the divers.

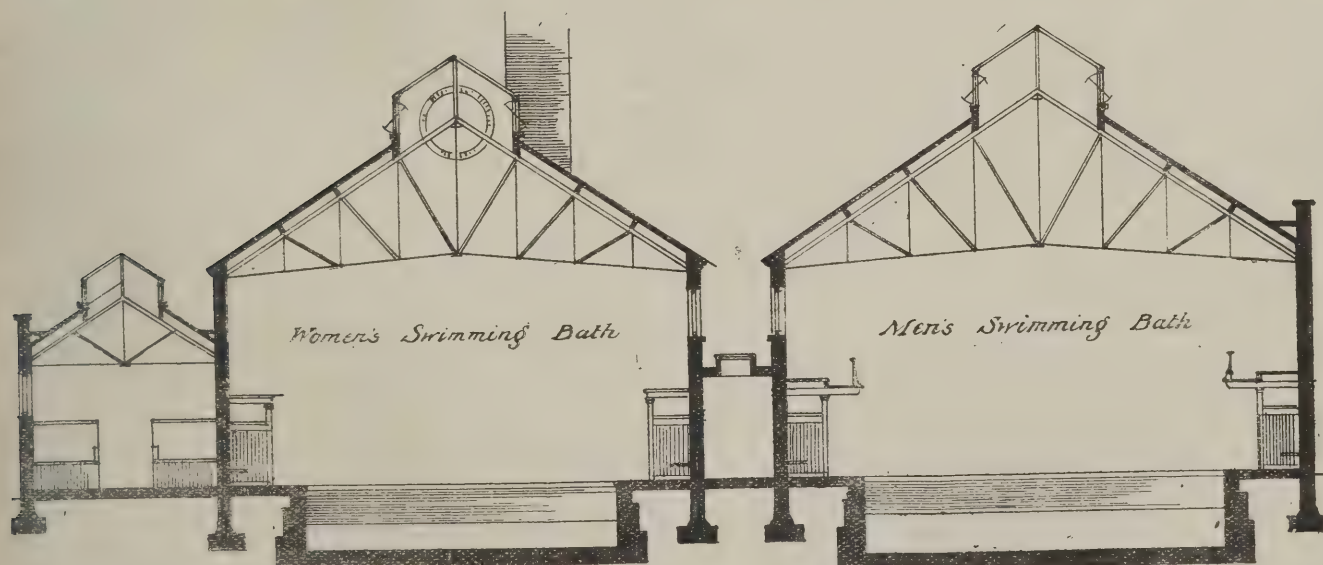
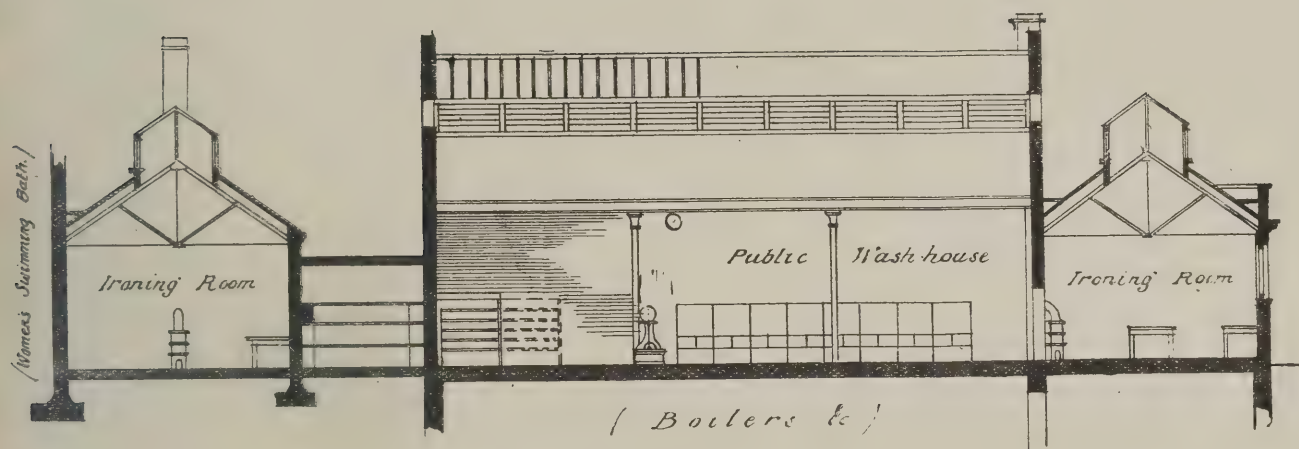
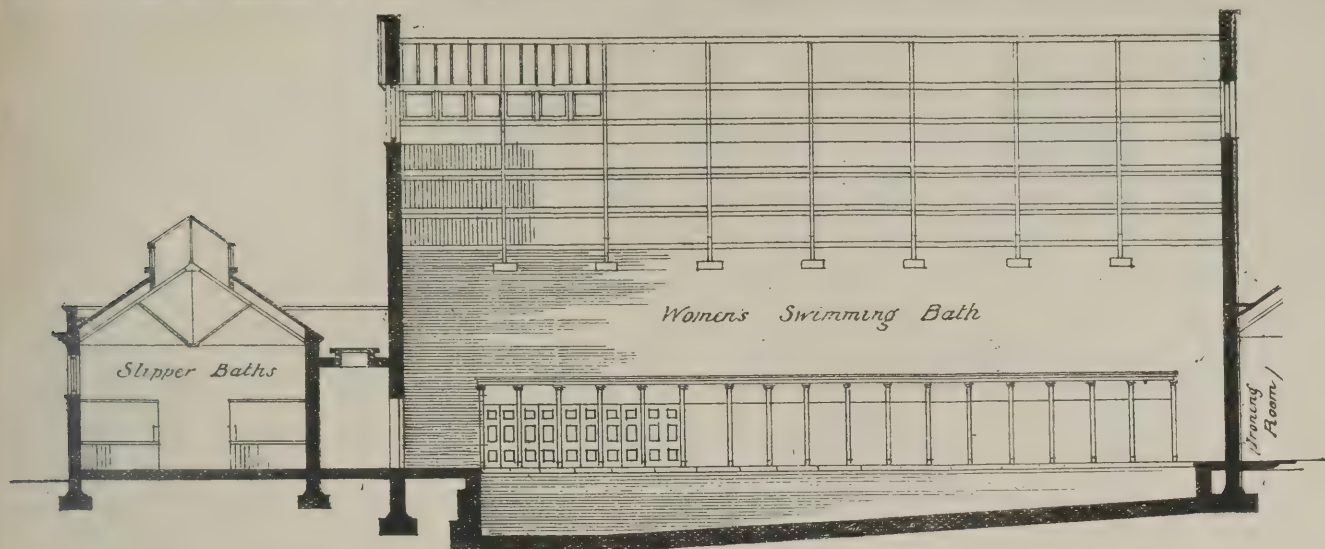
The more light and ventilation that can be gained in the swimming-bath the better for both comfort and appearance. A long ridge skylight is the first requisite, and clerestory windows are very much to the cheerful appearance of a bath. A movable light in either of the end gable walls is very useful for ventilating purposes.

The proper material for roofs of swimming-baths has been a matter of some discussion. Wood has been used with good effect; iron has been employed with economy. On wood there is less condensation; iron is cheap. It is a matter, apparently, of individual choice.

In excavating for swimming-baths it has been suggested that the excavation should at first be only with the side walls of bath, and after the walls have been erected the "cake" should be taken out, and the floor of the bath put in. Every architect is at liberty to employ methods that most commend themselves to him; but nine out of ten practical constructors would follow the usual system. It is a great thing to get rid of the mess of excavating before commencing building operations.

Swimming-baths may be constructed wholly

* Those at Endell-street, Bloomsbury, for example, are as bad. Since the low prices of the baths the public establishments prevent private enterprise from flourishing, it becomes the duty of bath commissioners to see that good first-class swimming accommodation is afforded. Proprietors of private swimming-baths cannot keep high-class concerns going at the low prices of public baths. The fine floating "Cleopatra" swimming bath off the Thames Embankment was closed shortly after it was opened—presumably from the cause stated. Many swimmers must thus have been deprived of their bath, and if they found the accommodation of the nearest public baths very inferior, they would have just cause to complain of the working of the Act of Parliament.



0 5 10 15 20 25 30 35 40 45 50 feet

concrete, or with concrete bottom and brick-in-cement side walls. In any case glazed bricks will be required for the face, and bricks glazed on the flat side form a good bottom. The main work should be executed in a pure, white-coloured brick. Ornamental bands are generally introduced, and a few dark bands along the floor of bath, in the direction of its length, are useful as a guide to divers.

There is, of course, great pressure and weight

of water in a large swimming-bath, and the floor and walls should be proportionately stiff. On bad soils much concrete is required for bottoms, and the foundations of side walls should be spread out considerably in two or more setts-off. On pp. 49, 50, and 51 of "The Turkish Bath" are description and plans of a plunge-bath constructed with horizontal and vertical courses of asphalt to prevent leakage. The same construction is applicable to a swimming-bath, and, indeed, has

been successfully adopted at the new baths at Goose-green, Dulwich. The bottom and the side walls of concrete and brick-in-cement respectively are first constructed, and the whole surfaces carefully coated with asphalt, care being taken that open seams and joints in the asphalt are not left to defeat the end of the process, viz., the prevention of leakage.*

* I am told that the majority of London swimming-baths leak more or less.

Some constructors will put the concrete bottom on puddle clay, and puddle behind the side walls. A better way is to rely on a good thickness of concrete, and well-laid, sound brickwork, or the stratum of asphalt advocated above. A bath constructed with good cement concrete bottom, and with side walls of good thickness, and faced with glazed bricks in cement, should not leak to any noticeable extent.

The bottom of a bath slopes from the shallow to the deep end, but the foundations of the side walls should be stepped in three or more steps. It is customary in this country to make the slope of bath even from end to end. Some Continental baths have a sinking of considerable depth at the deep end, as at the bath-house in the Wienstrasse, at Vienna. Figures of the depth of some of the German swimming-baths show a surprising depth at the deep end, and this is accounted for by the fact that there is a sudden dip in the floor of the bath and a deep pool formed for bathers. Such a device, however, is dangerous where there are non-swimmers or indifferent swimmers in the bath.

The sides of a good swimming-bath are vertical. Baths have been constructed with steps all round—as Brill's circular bath at Brighton—but the customary arrangement is here the best. Solid steps into the bath, too, as formerly adopted, have given place to detachable wooden steps.

BUILDERS' EVIDENCE BEFORE THE LABOUR COMMISSION.

AT Tuesday's sitting of Section C of the Labour Commission, which deals with building, textile, and miscellaneous trades, Colonel Stanley Geo. Bird, Mr. J. Mowlem Burt (of Mowlem and Co.), Mr. G. Grover, Mr. H. J. Wright, and Mr. J. H. Bridgman, representing the Central Association of Master Builders, gave evidence in contradiction and explanation of statements made to the Commission by representatives of the workmen. The suggestion that there was no Government inspection, said Mr. Mowlem Burt, was incorrect, as the inspector visited his works once or twice a year, and had in one case ordered him to put up fencing to protect the men against danger from machinery. Also, it was not true, as had been stated, that the men might be employed more regularly if the employers cared to do so. It was always the interest of the employers to keep the men at work, especially the good workmen. It was denied that trade-unions in the building trade did not admit into their ranks a man unless he was a thoroughly qualified workman. While members of the unions readily complied with the orders of these organisations to go on strike, they did not always obey instructions from the same source to return to work when disputes leading to rupture were referred to the associations of the parties, and settled by them. There was not between employers and employed in the building trades the cordiality which should exist. The men were still animated by a desire to get all they could.

Mr. Mundella (the Chairman): I suppose the employers also have a desire to get all they can? Mr. J. M. Burt: Yes; but I do not think the feeling is quite so extreme among them.

Colonel Stanley Bird, in reply to Mr. Mundella as to whether there was not a good deal of inferior building in London, said that in regard to buildings which were erected under contract with an architect and a clerk of works "scamping" did not go on; but in the case of speculative building, which was only subject to the supervision of the district surveyor, there was no doubt that it did prevail. In the West-end of London there were a good many buildings which, after a dozen years or so, almost wanted rebuilding; but such were "jerry built" by speculative builders for the purpose of letting. He complained that trade-unions, by insisting on a minimum wage to workmen whether good or bad, dragged all men down to a dead level, and said that now that the London County Council and other public bodies were undertaking their own building operations, the master builders would soon have to come to a stop. The allegation that master builders were careless of the lives of their workmen in consequence of being able to insure themselves against accident, he said, was untrue. As to the proposed inspection of scaffolding by a State inspector, he said he would rather that the responsibility should be thrown upon the men, because they

would have a personal interest in seeing that it was safe. At his own works notices were posted asking the men to assure themselves that the scaffolding and plant were in good condition, and stating that notice should be given to the employer if anything defective were discovered. Mr. Mundella pointed out that it was practically impossible for every individual workman who was employed on a large job to see that the scaffolding was entirely sound. The witness, continuing, said that a workman did not do half the work now that he formerly did in an hour, notwithstanding the increased wages he received and the greater purchasing value of those wages. A bricklayer would formerly lay 1,000 bricks in a working day of ten hours, but now a man will not lay more than 300 to 400 bricks in a day of nine hours. The letting of brickwork was now at 90s. a rod, instead of from 30s. to 40s., and in the joinery trade from the same cause it cost as much now to produce the same work by machinery as when the men had to do the whole of the work by hand.

Mr. G. Dew, of the London Building Trades' Committee, and Mr. F. C. Burton, a member of the Strike Committee of Carpenters and Joiners, detailed the circumstances of the late strike in the London building trades from the men's point of view, alleging unreasonableness on behalf of the masters in refusing to meet the men, though they admitted that the first definite offer of arbitration came from the masters. Asked if they were willing, on behalf of the men, in the case of any future dispute to refer the matter to an equal number of representatives of each class with an impartial arbitrator, Mr. Dew said he should not like to say so, as the workmen felt they were so terribly sold in the last arbitration, though personally he had no fear of the result if the arbitrator was an impartial man.

PRICES.*—LI. (CONTINUED).

(All Trade Discounts have been taken off, and Profit added.)

IRONMONGER, & C. (continued).

MILNER'S SAFES, & C.

PATENT FIRE-RESISTING BOXES—

			£	s.	d.
20 by 14 by 14 outside dimensions, fitted with 6-lever unpickable lock	each		4	8	0
22 by 16 by 16 ditto ditto	ditto		5	10	0
24 by 18 by 18 ditto ditto	ditto		6	12	0
26 by 20 by 21 ditto ditto	ditto		7	14	0
28 by 22 by 22 ditto ditto	ditto		9	10	0
30 by 24 by 24 ditto ditto	ditto		11	0	0

FIRE-RESISTING SAFES—

			£	s.	d.
24 by 18 by 18 without fittings, single doors	ditto		6	12	0
21 by 21 by 20 ditto ditto	ditto		8	0	0
28 by 22 by 22 ditto ditto	ditto		9	12	0
30 by 24 by 24 ditto ditto	ditto		12	0	0
32 by 26 by 26 ditto ditto	ditto		14	12	0
36 by 27 by 26 ditto ditto	ditto		17	5	0
42 by 27 by 26 ditto ditto	ditto		20	5	0
48 by 28 by 26 ditto ditto	ditto		24	5	0
54 by 30 by 26 ditto ditto	ditto		27	15	0
24 by 18 by 18 ditto with 2 drawers	ditto		7	16	0
26 by 20 by 20 ditto ditto	ditto		9	8	0
28 by 22 by 22 ditto ditto	ditto		11	4	0
30 by 24 by 24 ditto ditto	ditto		13	15	0
32 by 26 by 26 ditto ditto	ditto		16	12	0
36 by 27 by 26 ditto ditto	ditto		19	8	0
42 by 27 by 26 ditto ditto	ditto		22	16	0
48 by 28 by 26 ditto ditto	ditto		26	16	0
54 by 30 by 26 ditto ditto	ditto		30	10	0
36 by 27 by 26 ditto ditto	ditto		and		

42 by 27 by 26 ditto ditto	ditto		21	0	0
48 by 28 by 26 ditto ditto	ditto		24	10	0
54 by 30 by 26 ditto ditto	ditto		28	10	0
30 by 30 by 24 double doors, no fittings	ditto		21	10	0
33 by 33 by 27 ditto ditto	ditto		25	10	0
36 by 36 by 30 ditto ditto	ditto		29	15	0
48 by 36 by 30 ditto ditto	ditto		40	0	0
54 by 42 by 30 ditto ditto	ditto		45	0	0
60 by 48 by 30 ditto ditto	ditto		54	10	0
66 by 54 by 30 ditto ditto	ditto		64	0	0
72 by 60 by 30 ditto ditto	ditto		72	10	0
30 by 30 by 24 ditto with 2 drawers	ditto		24	0	0
33 by 33 by 27 ditto ditto	ditto		28	5	0
36 by 36 by 30 ditto ditto	ditto		32	15	0
48 by 36 by 30 ditto ditto	ditto		43	0	0
54 by 42 by 30 ditto ditto	ditto		49	0	0
60 by 48 by 30 ditto ditto	ditto		59	0	0
66 by 54 by 30 ditto ditto	ditto		70	0	0
72 by 60 by 30 ditto ditto	ditto		85	0	0
48 by 36 by 30 ditto ditto	ditto		and		
54 by 42 by 30 ditto ditto	ditto		46	0	0
60 by 48 by 30 ditto ditto	ditto		53	0	0
66 by 54 by 30 ditto ditto	ditto		63	10	0
72 by 60 by 30 ditto ditto	ditto		78	0	0
72 by 60 by 30 ditto ditto	ditto		93	0	0

LIST 2.—Safes throwing 3 bolts—

24 by 18 by 18 outside size	ditto		6	12	0
Ditto ditto	2 drawers		7	16	0
26 by 20 by 20 ditto	ditto		8	0	0
Ditto ditto	ditto		9	8	0
28 by 22 by 22 ditto	ditto		9	12	0

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28 by 22 by 22 outside size with 2 drawers	each	£	s.	d.
30 by 24 by 24 ditto ditto	ditto	12	0	0
Ditto ditto ditto ditto	ditto	13	15	0
31 by 26 by 26 ditto ditto	ditto	14	12	0
Ditto ditto ditto ditto	ditto	16	12	0
38 by 28 by 27 ditto ditto	ditto	17	5	0
Ditto ditto ditto ditto	ditto	19	6	0
Ditto ditto ditto ditto	ditto	21	0	0
and cupboard	ditto	20	5	0
42 by 28 by 27 ditto ditto	ditto	22	16	0
Ditto ditto ditto ditto	ditto	24	10	0
and cupboard	ditto	24	10	0
48 by 28 by 28 ditto ditto	ditto	26	18	0
Ditto ditto ditto ditto	ditto	28	10	0
Ditto ditto ditto ditto	ditto	28	10	0
and cupboard	ditto	28	10	0
54 by 28 by 30 ditto ditto	ditto	27	16	0
Ditto ditto ditto ditto	ditto	30	10	0
Ditto ditto ditto ditto	ditto	32	10	0
and cupboard	ditto	32	10	0
80 by 24 by 30 double doors	ditto	21	10	0
Ditto ditto ditto ditto	ditto	24	0	0
33 by 27 by 33 ditto ditto	ditto	25	10	0
Ditto ditto ditto ditto	ditto	25	5	0
36 by 30 by 36 ditto ditto	ditto	29	15	0
Ditto ditto ditto ditto	ditto	32	15	0
48 by 30 by 36 ditto ditto	ditto	40	0	0
Ditto ditto ditto ditto	ditto	43	0	0
Ditto ditto ditto ditto	ditto	46	0	0
and cupboard	ditto	45	0	0
54 by 30 by 42 ditto ditto	ditto	49	0	0
Ditto ditto ditto ditto	ditto	49	0	0
Ditto ditto ditto ditto	ditto	53	0	0
and cupboard	ditto	53	0	0
63 by 30 by 43 ditto ditto	ditto	54	0	0
Ditto ditto ditto ditto	ditto	59	0	0
and shelf	ditto	61	10	0
Ditto ditto ditto ditto	ditto	64	0	0
66 by 30 by 54 ditto ditto	ditto	70	0	0
Ditto ditto ditto ditto	ditto	76	0	0
and shelf	ditto	72	10	0
Ditto ditto ditto ditto	ditto	85	0	0
and shelf	ditto	93	0	0
Ditto ditto ditto ditto	ditto	93	0	0
divisions and cupboards	ditto	93	0	0

DOUBLE SAFES—

54 by 30 by 42 two drawers, cupboard, and 7 pigeon holes	ditto	65	0	0
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STRONG HOLDFAST AND FIRE-RESISTING SAFES—

24 by 18 by 18 outside	ditto	13	4	0
Ditto ditto	ditto	14	8	0
26 by 20 by 20 ditto	ditto	16	10	0
Ditto ditto	ditto	17	18	0
28 by 22 by 22 ditto	ditto	19	16	0
Ditto ditto	ditto	21	8	0
30 by 24 by 24 ditto	ditto	23	2	0
Ditto ditto	ditto	24	17	0
32 by 26 by 26 ditto	ditto	25	8	0
Ditto ditto	ditto	28	8	0
36 by 27 by 26 ditto	ditto	29	14	0
Ditto ditto	ditto	31	15	0
Ditto ditto	ditto	33	10	0
and cupboard	ditto	38	11	0
42 by 27 by 26 ditto	ditto	36	0	0
Ditto ditto	ditto	37	16	0
and cupboard	ditto	37	19	0
48 by 28 by 26 ditto	ditto	43	10	0
Ditto ditto	ditto	42	5	0
and cupboard	ditto	43	6	0
54 by 32 by 26 ditto	ditto	46	0	0
Ditto ditto	ditto	49	0	0
Ditto ditto	ditto	49	0	0
and cupboard	ditto	51	0	0
30 by 30 by 24 double doors	ditto	32	5	0
Ditto ditto	2 drawers	34	15	0
33 by 33 by 27 ditto	ditto	35	10	0
Ditto ditto	ditto	41	5	0
36 by 36 by 30 ditto	ditto	44	10	0
48 by 36 by 30 ditto	ditto	47	10	0
Ditto ditto	ditto	60	0	0
48 by 36 by 30 ditto	ditto	63	0	0
Ditto ditto	ditto	68	0	0
and cupboard	ditto	69	0	0
54 by 42 by 30 ditto	ditto	73	0	0
Ditto ditto	ditto	76	0	0
and cupboard	ditto	82	10	0
60 by 48 by 30 ditto	ditto	87	0	0
Ditto ditto	ditto	91	10	0
and cupboard	ditto	95	10	0
66 by 54 by 30 ditto	ditto	102	10	0
Ditto ditto	ditto	108	10	0
and cupboard	ditto	109	10	0
72 by 60 by 30 ditto	ditto	122	0	0
Ditto ditto	ditto	130	0	0
and cupboard	ditto	130	0	0

JEWELLERY SAFES—

24 by 18 by 18 with 2 drawers and 3 trays	ditto	16	0	0
26 by 20 by 20 ditto	ditto	19	10	0
28 by 22 by 22 ditto	ditto	23	0	0
30 by 24 by 24 ditto	ditto	27	0	0
32 by 26 by 26 ditto	ditto	31	0	0
36 by 27 by 26 ditto	ditto	34	10	0

CUPBOARD STANDS—

For No. 1 Safe	ditto	1	10	0
Ditto 2 ditto	ditto	1	12	0
Ditto 3 ditto	ditto	1	14	0
Ditto 4 ditto	ditto	1	16	0
Ditto 4 ditto	ditto	1	18	0

For No. 4 A Safe	each	2	0	0
Do 4 B ditto	ditto	2	0	0
Do 4 C ditto	ditto	2	2	0
Do 4 D ditto	ditto	2	5	0

SAFES AND CABINETS FOR JEWELS—				
No. 1 combined	ditto	28	0	0
2 ditto	ditto	33	0	0
3 ditto	ditto	38	0	0
4 ditto	ditto	44	0	0

PLATE SAFES—				
17 by 16 by 15 outside dimensions 1	ditto	9	10	0
24 by 18 by 18 ditto 2 ditto 2 ditto	ditto	11	0	0
24 by 24 by 20 ditto ditto ditto	ditto	13	10	0
28 by 22 by 22 ditto ditto ditto	ditto	16	10	0
30 by 24 by 24 ditto ditto ditto	ditto	19	0	0
32 by 26 by 26 ditto ditto ditto	ditto	21	10	0
36 by 27 by 28 ditto ditto 3 ditto	ditto	24	0	0
42 by 27 by 28 ditto 3 ditto ditto	ditto	27	0	0
48 by 28 by 28 ditto ditto 4 ditto	ditto	31	0	0
54 by 30 by 28 ditto 8 ditto ditto	ditto	36	0	0
60 by 32 by 30 ditto ditto 5 ditto	ditto	43	10	0
48 by 36 by 30 ditto 4 ditto 4 ditto	ditto	45	0	0
double doors	ditto	45	0	0
54 by 42 by 30 ditto ditto 6 ditto	ditto	53	0	0
60 by 48 by 30 ditto 6 ditto 8 ditto	ditto	66	0	0
66 by 54 by 30 ditto ditto 10 ditto	ditto	77	0	0
72 by 60 by 30 ditto ditto 12 ditto	ditto	90	0	0

A NEW WORKS DEPARTMENT AT THE LONDON COUNTY COUNCIL.

AN important departure was resolved upon by the London County Council on Tuesday after a long and animated discussion. A report was submitted by the General Purposes Committee recommending the constitution of a new Works Department, to consist of fifteen members, of whom one would be chosen from each of the existing committees, and there would be elected by the Council. It was recommended that to this new department there should be intrusted the present duties of the Stores Committee as to the purchase of articles required for general use, and in addition thereto the whole question of purchase and storage of plant and materials required in the execution of works and the general superintendence of all stores and store-keeping at the various depots in the Metropolis. To these also would be added the new duty of carrying out the works resolved upon by the Council. Under the proposed new standing orders every committee recommending the execution of any works should state whether they propose that the works should be executed by a contractor or by the Council, without the intervention of a contractor, and, if the latter course were recommended, they should lay before the Council full plans, specifications, and estimate of cost of the proposed works. This standing order would not at present extend to works of ordinary maintenance or repair. When the Council resolved to execute any works without the intervention of a contractor, the plans and specifications should, it was submitted, be referred to the Works Committee. If either the plans, specifications, or estimate of costs appeared to be inaccurate or insufficient, the matter would be referred back to the originating committee to bring up amended particulars. So soon as the Works Committee were satisfied as to the accuracy or sufficiency of the plans, specifications, and estimates, they would proceed to carry the works into execution. The Works Committee were to raise no question except as to the accuracy or sufficiency of the plans, specifications, or estimates, nor should they vary the plans or specifications, except upon the advice of the engineer or architect. Nothing was to prevent the engineer or architect, or the Works Committee, from taking action in cases of emergency; but such action would have to be reported to the Council forthwith. It was further proposed that the Works Committee should carry into execution all works which the Council resolves to execute without the intervention of a contractor, and should provide all necessary store-yards and workshops. The committee were to have power to contract, on behalf of the Council, for the supply of plant and material, provided that the amount of the contract did not exceed £500, and provided also that no contract involving an expenditure of more than £100 should be entered into except after public advertisement. They further recommended that the staff of the Works Committee should consist first of a "chief officer" at a salary of £1,000 per annum, whose duties shall include advising as to the purchase of stores, plant, and material, the regulation of all store-yards and workshops belonging to the Council, and the execution of all works carried out by the committee. The department is to be divided into three branches, those of

engineering, building, and stores. That the subordinate staff be as follows:—(a) General.—One first-class clerk, commencing at £200; one third-class clerk, commencing at £100. (b) In the engineering branch.—One engineer, salary £400; one cost clerk, salary £250; gangers, foremen, and labourers as necessity arises. (c) In the building branch.—One principal assistant for buildings, salary £250; pricing clerk, salary £200; measuring surveyor, salary £200; foremen and labourers as necessity arises. (d) In the store branch.—One principal storekeeper, salary £150; one third-class clerk, commencing at £100; store clerks at the various depots.

Mr. Fardell moved an amendment, deferring the consideration of the report till express powers had been granted by Parliament to the Council to establish a Works Department. The amendment, after discussion, was rejected by 82 to 28 votes. The recommendations of the committee were adopted with some modifications, including the fixing of the salary of the proposed chief officer at £700 instead of £1,000 per annum, and the alteration of his title to "manager of works and stores." The members to serve on this new department will be nominated at the L.C.C. meeting on Tuesday week, the 6th prox.

PLUMBERS' REGISTRATION AND EXAMINATIONS.

THE London Board of Examiners in connection with the National Registration of Plumbers met on Tuesday, at the Guildhall, London, Mr. Charles Hudson, Chairman of the Board of Examiners, presiding. The meeting was attended by the representatives of the several London Lodges of Operative Plumbers. Various matters with reference to the examination questions and practical tests for candidates for registration by the Plumbers' Company were discussed and adjusted. Regulations with reference to the conduct of such examinations were revised. Additional regulations for examinations in provincial centres were approved, the object being to facilitate those examinations. At the conclusion of the business the examiners dined with the wardens of the Company, the warden (Mr. W. H. Bishop) presiding. Sir Philip Magnus (renter warden) defined the functions of the examiners as being two-fold—to examine the work of the candidates for registration, and also to indicate by the character of their examination tests the lines on which should proceed the course of study, combined with practical work to be followed by plumbers, and the teaching which apprentice plumbers should receive. Mr. C. T. Millis, M.I.M.E., principal of the Educational department of the Borough-road Polytechnic Institute, stated that, although the attendance at the plumbers' classes at that institute had steadily increased, there had been no diminution in the attendance at the classes at any of the other London institutes, showing that the accommodation which had been provided at the Borough-road Institute had supplied an actual want. He also referred to the opening of a class for adult plumbers at the institute. Mr. J. R. Beeston (representing the West Central Lodge), Mr. C. Early (representing the Sydenham Lodge), and Mr. C. Dean (representing the No. 1 Lodge) of Operative Plumbers, and others, made reference to the increased interest taken in the technical education of plumbers and the registration system by the several lodges of operative plumbers in London. It was recommended that a mass meeting of London plumbers should be called to consider the present position of the registration movement and the extension of plumbers' classes in the London district. Mr. Geo. B. Davis (of the firm of George Jennings) mentioned several cases of plumbers in his firm taking employment under local sanitary authorities as sanitary inspectors.

The Lord Mayor of Dublin presided at the annual public meeting held the other day under the auspices of the Dublin District Council for the National Registration of Plumbers. There was a large and representative attendance. Dr. E. J. M'Weeney moved the following resolution:—"That the registration movement, which has now been fully organised throughout the United Kingdom, is worthy of support, because it is calculated to protect the public against the danger of bad plumbing." He said that this was a subject which came home to everyone's backdoor. The plumber's art was so intimately connected with the public health that its practice should never be intrusted to an inefficient hand, or an unin-

structed operative. That was why the registration movement, the object of which was to enforce the suitable education of plumbers, was a public necessity, and he might add, had successfully triumphed over its enemies. Sir Charles Cameron, medical officer of health for Dublin, seconded the resolution, and strongly supported the plumbers' registration movement. Mr. Simmons, Secretary Trades' Council, supported the resolution, which was adopted. On the motion of Mr. W. Kaye Parry, M.A., C.E., seconded by Mr. W. Walsh, secretary of the Dublin Lodge of Operative Plumbers, the following resolution was also carried unanimously:—"That the meeting is of opinion that the Plumbers' Registration Bill, introduced by the Worshipful Company of Plumbers during the last session of the Imperial Parliament, should be placed upon the statute book at the earliest opportunity, and the Irish Members of Parliament are hereby requested to give the Bill their active support, and that copies of this resolution be forwarded to the Right Hon. the Chief Secretary for Ireland and to the members for the City and County of Dublin."

BOOKS RECEIVED.

A Popular Handbook of Nonconformist Church Building, by JAMES CUBITT, F.R.I.B.A. (London: James Clarke and Co., Fleet-street), will be found a useful and suggestive little book to all engaged in the building of Nonconformist churches. Those of our readers who have read Mr. Cubitt's series of articles on this subject in our pages—of which the present little volume is practically a reprint, though it is not said so—will hardly need to be told of the views enunciated by the author, who has had some considerable experience in this branch of his profession. Mr. Cubitt distinguishes two tendencies, both of which have a claim on the Nonconformist church builder. One is the "congregational," and the other the "ecclesiastical" tendency. The first of these regards that the building shall be primarily adapted for preaching, that every member shall see and hear the preacher easily, and be in actual contact with him. The prayers, too, are extemporaneous, and must be distinctly heard, as there is no liturgy which everyone can follow, whether he hears or not. The singing also is congregational, not choral, and, therefore, the choir must be in the congregation or auditorium. The "ecclesiastical" ideal is not so concerned with simply practical requirements: they look for, as the author says, "a high standard in the accessories of public worship—in architecture and music and the arts." Beauty, as well as truth, is aimed at, and the ecclesiastical builder likes the church to have some traditional form and association with those of former ages. Mr. Cubitt clearly sees the advantage of reconciling these two tendencies, and his little book of suggestions and instructions, accompanied, as they are, by plans of churches of different types, will be read with profit by architects and others. He names L, T, and cruciform plans as three varieties of columnless buildings suitable for the object of preaching and for congregational requirements. But he also points out how columns may be employed with architectural effect, and help to break up echoes, and some of the best plans show columns kept clear of the central space, but limited to a few. Many plans of the "central area" type, based on the square, and on octagons and other polygons, are illustrated and described. — *Electric Light, its Production and Use*, by JOHN W. URQUHART, Electrician, with numerous illustrations, fifth edition revised (London: Crosby Lockwood and Son) is a new edition of a treatise we lately noticed. The revision and additions have made Mr. Urquhart's book still more complete as a manual. The chapter on the "Control of Central Station Lighting" will be of value and interest to all students and engineers. The illustrations are clear and well drawn, not always the case in these handbooks. Every necessary information is given on the various appliances and new developments of electric machines, accumulators, and lamps, and, as an elementary manual on the subject, we know of no better book.—A fifth edition, enlarged and revised, is to hand of the well-known and reliable *Handbook of House Property*, by E. L. TARBURCK (London: Crosby Lockwood and Son.) The book now consists of four divisions, the first three dealing with the Law, Valuation, and Building of Houses, and the last with the

Art of House Building.—*Woodwork* (The English Sloyd), by S. BARTER, instructor of manual training in woodwork to the London School Board, &c., with illustrations (London: Whittaker and Co.). Mr. Barter's octavo volume is admirably printed, and illustrated by diagrams of work and views of manual operations, adding much to the value and usefulness of the work as a guide for public elementary schools. In the preface, which is written by Mr. George Ricks, B.Sc.Lond., it is clearly laid down that "manual training is a special training of the senses of sight, touch, and muscular perception by means of various occupations; and it is the training of these faculties, not so much for their own sake as it is for the training of the mind." The main aim is educational; the essence of manual training lies in the *practice*, not in the *production*. Upon these grounds Mr. Barter's work is composed. The chapter on drawing and projection is useful and well illustrated by diagrams; the next chapter treats on timber, its growth, seasoning by water and hot-air, shrinkage, and the various kinds of conifers and broad-leaved woods. The chapters on tools and benchwork occupy a large portion of the volume, and various exercises are well explained and illustrated by examples of marking, sawing, and chiselling, planing, jointing of different kinds of framing. A useful chapter on the workroom and its fitting concludes this useful work. The models include newspaper racks, picture-frames, boxes, brackets, letter-cases, and a number of useful objects, describing the materials and operations. As a manual of instruction on woodwork, Mr. S. Barter's book will be found an admirable guide, as each exercise is accompanied by the necessary drawings and instructions, leading the pupil from an intelligent conception of the subject through the operations needed to construct the required object. As a training of manual and visual faculties of the student, nothing better can be given.—*Treatise on Thermodynamics*, by PETER ALEXANDER, M.A., Ex-Breadalbane Scholar, Glasgow University (London: Longmans, Green, and Co.), is a work in which the subject is treated in all its details from the two laws, one enunciated by Joule and Rankine, that "Heat and mechanical energy are mutually convertible"; the second by Thomson, that "If an engine be such that when it is worked backwards, the physical and mechanical energies in every part of its motion are all reversed, it produces as much mechanical effect as can be produced by any thermodynamic engine with the same temperature of source and refrigeration from a given quantity of heat." Upon these laws Thomson and Joule have established the science of thermodynamics. Mr. Alexander's treatise gives a succinct mathematical exposition of these laws; but the pages are too full of algebraic expressions and formulæ to be understood by the general student, or to permit of examination in these pages.—*Lockwood's Dictionary of Mechanical Engineering Terms*, edited by A. FOREMAN PATTERN-MAKER; second edition revised (London: Crosby Lockwood and Son), is well known as one of the best dictionaries of the kind; and this edition, which has been revised and considerably extended by additions in the form of an appendix, needs little commendation from us. The editor, as a foreman pattern-maker engaged in factory duties all his life, has had undoubted opportunities for the compilation of such a dictionary, which will be of great use to all engineering pupils and amateurs. The terms are brief and concisely stated, and show a practical knowledge of the subjects.

BRIDGE OVER THE OHIO.

THE cantilever highway bridge at Cincinnati across the Ohio River, between Cincinnati and Newport, is a structure of some magnitude, designed by Mr. A. H. Porter, approved by Ferris, Kaufman and Co. The roadway is 24ft. wide, with side-walks of 7ft. each, and the total length is 2,966ft., with a cantilever span of 520ft. between centres of piers. There are six main spans, twenty-eight pedestals, and nine piers; all these piers are of masonry. Full details and description of this bridge is given in the *Transactions of the American Society of Civil Engineers*, by Messrs. Gustave Kaufman and L. C. Osborn, members. The cantilever span is minutely detailed, and a strain sheet given. The live load for all truss members receiving more than one panel load is 80lb. per square foot for suspended span and cantilever arms. For

stringers, floor-beams, and long suspenders, 100lb. per square foot of clear roadway and side walks. In the calculation, the following condition of live-load are assumed: For main truss members the roadway and walks will be considered loaded; for long suspenders, roadway and one side walk only will be considered loaded. Wind stresses are calculated for a pressure of 30lb. per square foot on the exposed surface of both trusses and railings.

OBITUARY.

MR. WILLIAM SIMPSON, builder, of Alyth, near Dundee, died on Thursday last week. Mr. Simpson, on account of advancing years, had been in frail health for some time. He went to Alyth during the erection of the parish church in the years 1837-8-9, at which large job he was employed as a foreman. After this he contracted on his own account, and built many large houses in the town and district. Mr. Simpson was predeceased by his wife, and is survived by two sons and three daughters, the eldest of the former being the Rev. William Simpson, of Bonhill. Deceased was in the 85th year of his age.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE, AND ART.—The eighth annual report just published congratulates the members on the fact that the Institute continues to grow in numbers and influence. Twenty-four ladies have been admitted to the Associateship of the Institute, in accordance with amendments in the constitution agreed to at the last annual meeting. Last year's roll contained the names of 50 members, which is increased this year to 54 by the transfer of one from associate to member, and the election of five new members, while two have resigned. In the former session the associates numbered 167. This year, by the death of two, transfer of one, resignation of 10, and election of 35 (24 ladies and 11 gentlemen), the number is increased to 189. The roll of honorary members remains as before. The treasurer's balance-sheet shows an increased income, but along with that a very largely increased expenditure, caused principally by the greater number of lectures and a considerable deficit on the two excursions.

GLASGOW INSTITUTE OF ARCHITECTS.—A general meeting of this institute was held in Glasgow on Friday, Mr. W. F. Salmon, president, in the chair. The chairman stated that the meeting had been called to consider a unanimous recommendation by the council with reference to the Lanarkshire County Council competitions. As the conditions of competitions for the above were unsatisfactory in the following points, the Institute recommended that members should take no part in them: (1) As the competitors are not assured that an architect of experience will be associated with the medical officer to advise the committee in its decision; (2) that no guarantee is given that the author of the design placed first in the order of merit will be employed to carry out the work (provided that inquiries as to his status prove satisfactory); and (3) that the terms of employment of the architect selected to carry out the work are not stated. The chairman commented on the unsatisfactory nature of the conditions of competition, and reference was made to the memorial, which had been largely signed by the profession throughout the country, by which they pledged themselves not to take part in any competition unless there was a professional assessor appointed. On the motion of Mr. Campbell Douglas, seconded by Mr. John Honeyman, the recommendation was unanimously adopted.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The opening address of the 17th session of this society was delivered in the Law Institute, Leeds, on Monday night, by the President, Mr. G. B. Bulmer, F.R.I.B.A. Since the formation of that society the air had, the President said, been rife from time to time with the sound of their discontent because not one good architect could be found in Leeds; but "they had changed all that now," and it was they who had helped to throw oil on the troubled waters. At the present moment there were several public works in this town just finished or being erected from the designs of Leeds men, and he felt sure that a quiet undercurrent of thought existing amongst

them had largely helped to forward this result, and where recourse had been had to competition, fairer and more honourable conditions than had usually obtained in the past had been secured for them by their sympathy. Having referred with satisfaction to the increase in the muster-roll from 74 in 1882 to 110 in the present year, Mr. Bulmer mentioned an idea which had occurred to him—the amalgamation of the Leeds, York, and Bradford societies, as representing the united county. Sheffield was so far on the border that it might perhaps be taken as the centre of a large district lying to the south of it. A gentleman had recently asked him: "Do you think your society has done any good? An unqualified affirmative could be the only answer. Those who had regularly attended their lectures, numbering about 120 up to date, on a variety of subjects connected with their profession, must have been benefited thereby. The Associates and pupils who earned their prizes and enjoyed the educational assistance they afforded, must see its uses when they reflected that 17 years ago there were no prizes, no library, and no encouragement or assistance from their senior members. No reflective mind could fail to see that they had constructed a powerful machine. It remained for them to use it to the best advantage, and so give additional evidence that they had not worked in vain. Mr. W. Watson, Wakefield, proposed, and Mr. J. Holmes Greaves seconded, a vote of thanks to the President. A set of drawings of Skelton Church were exhibited by Mr. J. L. Grant, who has entered these for the society's silver medal and the prize of five guineas given by the President. A number of sketches by Mr. T. D. Brooks, executed by him in connection with the travelling studentship of ten guineas awarded by the society, were also exhibited. The syllabus for the session thus inaugurated is as follows: Dec. 4, "Vaulting," by A. Keen; Dec. 19, Social Evening; Jan. 23, 1893, "Electric Lighting," by T. S. Watney; Feb. 6, "The Knights Templars in England," by J. W. Moor Kill; Feb. 20, "Remarks on Colour Decoration," by H. V. Lanchester; March 6, Exhibition of Architectural Drawings, shown by limelight; March 20, "Dore Cistercian Abbey Herefordshire," by Roland W. Paul; April 24, Annual Report and Election of Officers.

LIVERPOOL ARCHITECTURAL SOCIETY.—A special meeting of this society took place at the society's library, Liverpool, when a paper was read by Mr. Wm. Owen, F.R.I.B.A., of Warrington, on "Chester Cathedral." The paper treated of the history of this interesting structure in a most exhaustive manner—bringing it from its earliest inception to the present time, and a well-deserved tribute to the late Sir Geo. Gilbert Scott, the restorer of the fabric, was paid by the lecturer. The paper was well supported by large and well-executed drawings and sketches, illustrating the four periods of Gothic architecture, which are so well exemplified in this charming monument of Mediæval art. A ground plan of the building, coloured as to show distinctly the portions of the building which were built in the Norman, Early Decorated, and Perpendicular periods, with a corresponding chart showing the dates and reigns during which these styles prevailed, was a unique and edifying illustration of the lecturer's remarks, which were listened to by a large gathering of students and older members with much appreciation.

CHIPS.

The parish church of Shrawardine, Salop, has been reopened after restoration. The church stands on the site of a Norman edifice destroyed in the Civil War, the nave of the present building dating from 1649, and the chancel from 1722. The alterations include new seats made out of the oak pews, stalls for the choir, a chancel screen with doors, a chancel arch, and paving the floor with tiles. The work was carried out by Mr. R. Price, contractor, of Coleham, Shrewsbury, from plans by Mr. Percy H. Currey, architect, of Derby.

At the last meeting of the Brighton town council, a proposal was brought forward for the erection of a winter garden, at the cost of about £25,000, on the western lawn of the pavilion. After discussion a resolution was carried affirming the desirability of a winter garden, and referring the whole matter to a special committee to consider and report at an early date.

Mr. James Hicks, architect, Redruth, has been instructed to prepare plans and a scheme for providing a hall over the Butchers' Market at Redruth.

CONTENTS.

"The Stickit Architect"	727
Claims for Fees	727
Architectural Association	728
Exhibition of Doulton Ware	729
The Dudley Gallery	729
Robert Boyle and Son, Limited	729
Public Baths and Wash-houses.—IV.	730
Builders' Evidence before the Labour Commission	732
Prices.—II.	732
A New Works Department of the London County Council	733
Plumbers' Registration and Examinations	733
Books Received	733
Bridge over the Ohio	734
Obituary	734
Architectural and Archaeological Societies	734
The Building News Directory	734
Our Illustrations	735
Way-side Notes	754
Competitions	755
Building Intelligence	755
Engineering Notes	756
Correspondence	756
Intercommunication	757
Legal	758
Legal Intelligence	758
Water Supply and Sanitary Matters	759
Our Office Table	759
Meetings for the Ensuing Week	760
Trade News	760
Tenders	763

ILLUSTRATIONS.

HYDE PARK COURT.—WIGHTWICK MANOR.—DRYBURGH ABBEY.—ELMLEY CASTLE CHURCH.—A STUDIO.—THIRTEENTH-CENTURY SOUTH ITALIAN CARVED WOODEN COLUMNS TO ORGAN.—PUBLIC SCHOOL FOR GIRLS, HONGKONG.

Our Illustrations.

HYDE PARK COURT.

THIS colossal block of mansions has not before been illustrated, although considerable attention has been attracted to the work, owing to the legal proceedings which were taken by the County Council to prevent the erection being carried up to an excessive height. Hyde Park Court is situated in the main thoroughfare of Knightsbridge, overlooking in the rear Rotten Row, with the Park and Serpentine beyond. The building is fitted with every modern improvement. It is built of red brick, with stone dressings and ornamentation; and the numerous balconies and balustrades of stone and iron, the double ascent of bays, the portico, supported on massive columns, and the turret at the extreme top, combine to give it an appearance of grace and solidity. Everything in connection with the building has been done upon a vast scale. The culinary department in the basement is fitted throughout on the latest and most approved principles. The sculleries, vegetable, pastry, and other rooms are all distinct from the kitchen; and gas is used as little as possible in the cooking operations. The culinary apparatus has been erected at a cost of over £3,000, and, with the electric light, the tiled floors and walls, and the well-ventilated, airy apartments, cleanliness is attained. On the lower ground floor—which is on a level with, and looks upon, Knightsbridge-road—are three billiard rooms for the use of the tenants, the walls of which are of carved pine panelling. Then there are card and smoking rooms, a succession of lavatories, and a hair-dressing saloon. The entrance-hall is approached from the porticoed entrance in Knightsbridge, through carved walnut swing-doors. A centre flight of white marble steps leads up to the ground floor level, these, and the passage on either side, being flanked by a marble balustrade. The floor, the walls relieved by pilasters, with gilded capitals, the columns, the massive mantel and fireplace, with clock over, are all of marble, in variety of colour and working. The panellled ceiling is a fine specimen of frescoed work. To the left of this hall are the manager's and general offices, service-room, and ladies' cloak-room, and beyond these the general reception and reading-room. The breakfast and dining-room, overlooking the Row and the Park, is decorated in much the same style; both fittings and furniture being all in character. The first, second, and third floors are arranged as family suites, self-contained, each consisting of hall, drawing and dining rooms, four bedrooms, bath-room (with fireplace), kitchen, and excellently-appointed offices, the inner corridor being of oak wood-block flooring. These are decorated, fitted, and furnished to suit incoming tenants. Where a family does not care to be troubled with a large staff of servants and

culinary matters—board *en pension* can be obtained downstairs—the kitchen and offices are converted into additional bedrooms. There are four family and one bachelor's suite on each of these floors. In the rear of the building is the most striking feature of all, by means of which perfect immunity from danger in case of fire is afforded. This is a large iron spiral staircase, at some distance from the building, but communicating with every floor. The whole erection—walls, floors, partitions, and staircases—is of fireproof construction, thereby reducing the chances of a fire to a minimum; but here, with this spiral staircase, if one should occur, the egress of the inmates is easy, sure, and safe. As a further safeguard two fire hydrants are affixed on every floor. This spiral staircase takes its rise from a stone loggia, which, immediately overlooking the Row and Park, and communicating with a balcony, forms a pleasant summer's evening lounge and promenade. A comfortable hydraulic elevator, to take ten persons, gives access to all floors. This elevator is available for use night and day. The building has been completed from the designs of the architect, Mr. Thomas Archer, of Sackville-street, Piccadilly. Messrs. J. W. Hobbs and Co. were the builders.

ADDITION TO WIGHTWICK MANOR.

It is only about four years since Messrs. Grayson and Ould built this house in the old timber style for Mr. S. Theo. Mander in the country near Wolverhampton, but they have now been employed to build an addition to it, which is as large as the entire house originally built. This consists of a hall or "great parlour," about 50ft. by 24ft. with an open panellled roof and minstrels' gallery, a billiard-room, dining-room, secondary staircase, and servants' offices, with bedrooms over all but the parlour. The style adopted is again the black and white, but it is more massive, as well as more ornate, than the original structure. The chimneys are twisted, of South Country brick, from Mr. James Brown, of London. Messrs. Rattee and Kett, of Cambridge, supplied the oak work, and the contractor is Mr. Henry Wilcock, of Wolverhampton. Illustrations of the original house will be found in the BUILDING NEWS for July 12, 1889.

DRYBURGH ABBEY.

THE architecture of Dryburgh Abbey is for the most part Norman, but much belongs to a far earlier date. Among the ruins may be observed four distinct styles of arches, viz.: The massive Roman arch, with its square sides; the deeply splayed Saxon; the pillared and intersected Norman; and the Early English Gothic. The chapter-house and abbot's parlour are of much greater antiquity than the church, which was probably never wholly repaired after its destruction in 1322. The church was in the form of a cross, with aisles. The nave was 190ft. long, by 75ft. broad. Under the high altar, James Stuart (of the Darnley family), the last abbot, is buried. The illustration is of part of the north transept, called St. Mary's Aisle, and is of beautiful Early English Gothic work. It is in this aisle that Sir Walter Scott, Bart., is buried; also Lady Scott; and his son-in-law and biographer, J. G. Lockhart. Little now remains of the monastery but the chapter-house, St. Modan's Chapel, and between them a large vaulted chamber, now the family vault of the Biber Erskines. The chapter-house is 47ft. long by 23ft. broad, 20ft. high. Beneath the floor of the chapter-house lie the mortal remains of the founders, Hugo de Morville and Beatrix Beauchamp, his wife. The abbey was founded in the year 1150. The illustration of Dryburgh Abbey and Elmley Castle Church, Worcestershire, are from photographs taken by Mr. Lionel Erskine Westropp.

THE CHURCH OF ST. MARY, ELMLEY CASTLE, WORCESTERSHIRE.

THE Church of Elmley is of Saxon origin; the remains of the Early walls are to be seen (the stones standing edgewise) in the chancel, built either by the Saxon tenants of the Bishop of Worcester before the Conquest, or by the Normans very soon afterwards. The church was restored at the time of the Reformation. In the south aisle the pillars below the transept are much plainer than the others, looking very much as if they had been cut out of the old wall when the aisle was added on, they are square and have no capitals. In the south transept there is a recess in the wall, which looks as if it

had belonged to a side altar, the place at which probably the special worship of the Virgin Mary was carried on. The upper part of the tower was probably built about this time (1546). The pedestal of the font is a subject of interest: the lower part is decidedly Norman of very Early date; the bowl is of more recent date, probably time of the Tudors. The church was beautifully restored about 14 years ago.

STUDIO FOR MR. DENDY SADLER.

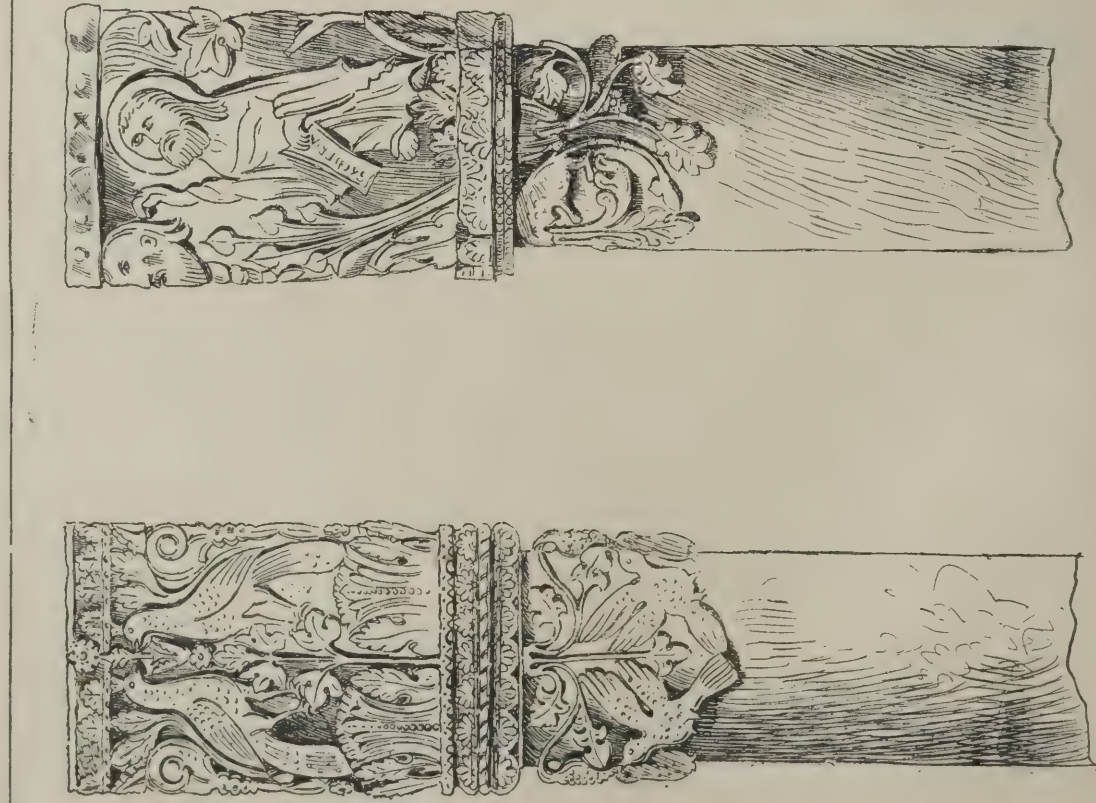
WE illustrate this week the interior of a studio which is shortly to be erected at Hampstead for Mr. W. Dendy Sadler, the well-known artist, from the drawings and under the superintendence of Mr. Fred J. Lewis, architect and sanitary surveyor, of Clement's Inn Chambers, 263, Strand. Our sketch shows one end of the studio, across which runs an oak balcony, supported upon two elaborately carved pillars. The balcony front is richly carved in a floriated design, and was secured, besmeared with paint, on the demolition of one of the City churches. The accommodation for the models is provided beneath the floor of the studio, and is reached by a flight of stairs beneath the balcony, thus securing the models the greatest amount of comfort, with the least expenditure of floor space. The ceiling is divided into two portions by a bold oak beam, or rather casing to a steel girder, which carries the rooms over the ceiling above; one half is deeply coved, so as to allow sufficient head room for persons standing upon the balcony, whilst the remainder of the ceiling is flat, with oak moulded ribs, thus dividing the ceiling into squares. The walls beneath the higher position of the room are covered with oak panelling and Italian leathers, from the floor level up to the frieze, which is plain white, whilst the other portion of the room is provided with a dado, above which tapestry will be hung. The glass-house, which is to be used for painting exterior views, is 25ft. square, and will lead directly out of the studio.

CARVED WOODEN COLUMNS FROM SOUTH ITALY.

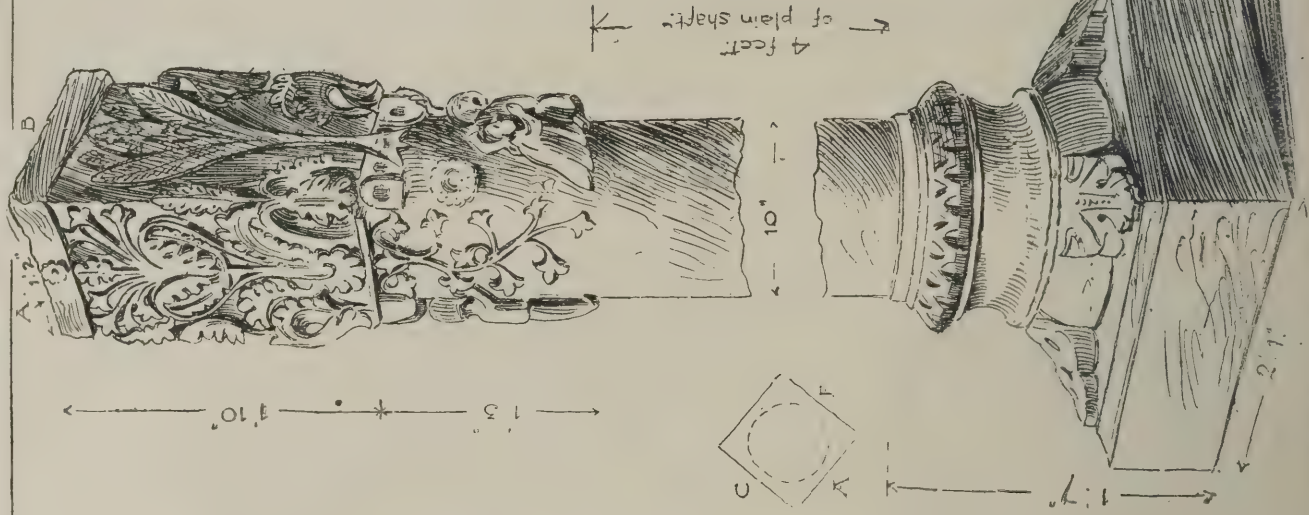
MR. WYKE BAYLISS, at the opening meeting of the Society of Architects, as reported in last week's BUILDING NEWS, said: "There was one of the loveliest things in the world that we Englishmen could cultivate, and that was the art of wood-carving"—words that were received with applause. The examples of Italian wood-carving, sketched at the South Kensington Museum, which we illustrate in our present issue, show what that country could produce as early as the thirteenth century. Crude as they possibly are in workmanship, they are full of life and feeling, and afford by contrast an instance of the deterioration of spirit which modern work displays only too often. Of technical skill there is abundance—of living ideas nearly nothing. One can imagine the ancient workman-artist chipping out the ideas as they formed in his mind, and revealing his varying moods—here putting a little humour in his work, there piety, here expressing grace and delicacy, there revelling in an uncouth form or quaint device, and so producing, whatever its faults may be, something which has human interest in it. On the contrary, most of our modern work, turned out with the placidity and monotony of a machine, means, and consequently suggests, nothing; and, even if the eye is satisfied, the mind is not regaled.

PUBLIC SCHOOL FOR GIRLS, HONGKONG.

THIS building is now being erected in the Hollywood-road, Victoria, Hongkong. It is designed to cost, with furniture and fittings, 30,000 dolars; and it is the intention of the Hon. E. R. Bellios, who has taken a great interest in educational movements, and at whose expense the building is being erected, to hand it over upon its completion to the Colonial Government for the promotion of education among the Chinese and Eurasian population. The school building is a three-storied one, with four class-rooms upon each floor, and is arranged to accommodate in the first case 576 scholars. The principal entrance is upon the Hollywood-road, from which access is obtained directly to the first-floor level. The walls are of Canton red and blue bricks plastered, with white granite plinth, dressings, &c. The roofs are to be covered with a double course of Canton pan and roll tiles. The floors are to be of teak, and most of the carpentry is of hardwood. Mr. Edward A. Ram, of Messrs. Sharp and Co., Hongkong, is the architect, and the work is being executed by Mr. Lai Yow, contractor, of Hongkong.



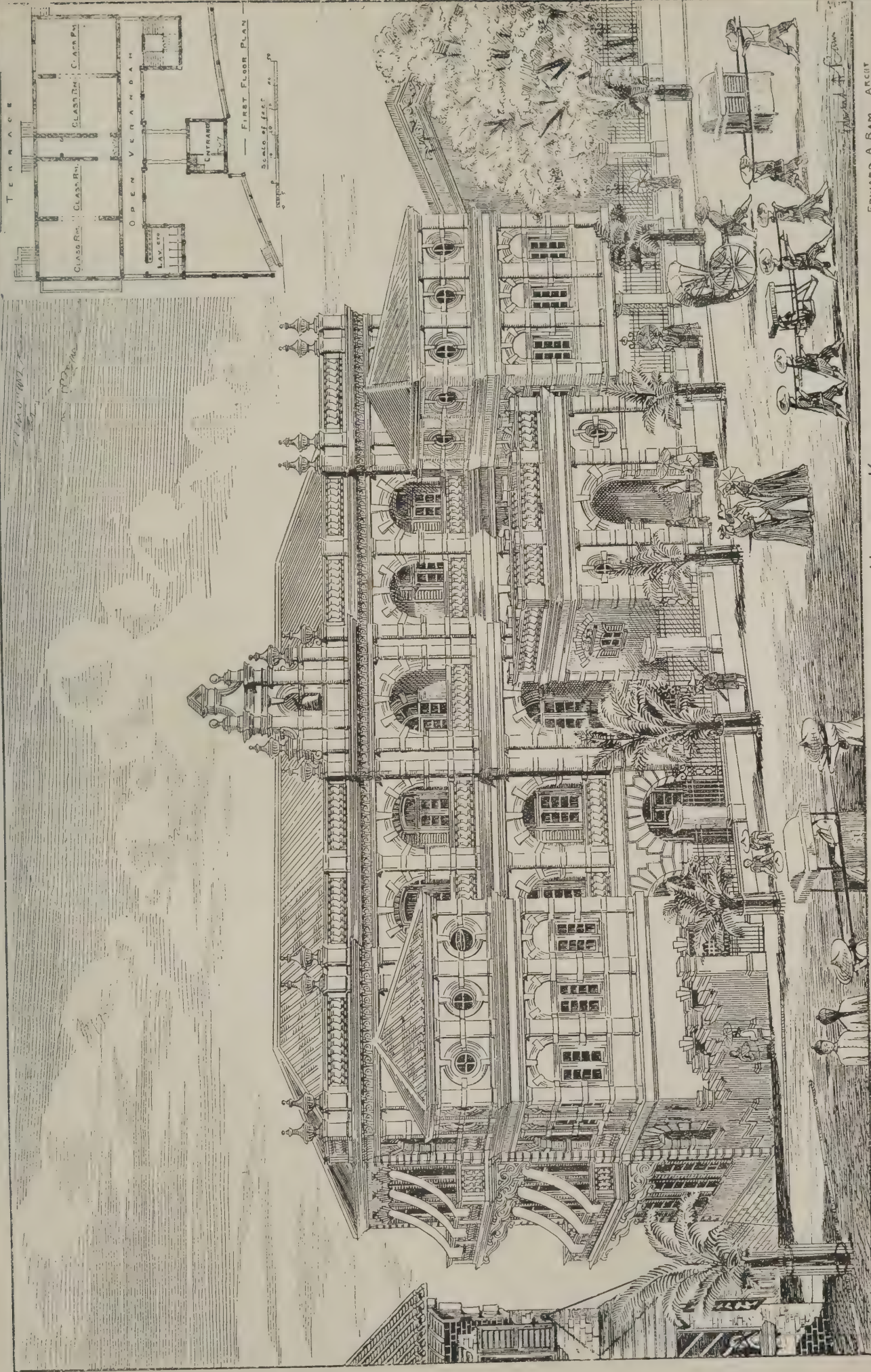
CARVED WOODEN COLUMNS TO ORGAN
FROM SOUTH ITALY. ABOUT 13TH CENTURY.



NOTE: LOWER SOCKETS AND
BASES ARE MODERN SUBSTITUTES
FOR LION SUPPORTS OF WHICH ONLY TWO DEFACTED
EXEMPLARS REMAIN.

Edinburgh, 1892.

THE BUILDING NEWS, Nov. 25, 1892.



PUBLIC SCHOOL FOR GIRLS HONG-KONG.

EDWARD A. RAM, ARCHT.
HONG-KONG.

WAYSIDE NOTES.

THE long-expected competition for the new "Blue Coat School" is announced, and a very good thing it will be—for those who may be invited to compete. By general consent, this is a competition for the princes only of the architectural art or profession—there are not many of them left, nowadays. The ordinary practitioner can only look on, deriving, perchance, something of that satisfaction felt by a hungry urchin flattening his nose against a baker's window-pane—if my simile be excused. I have watched with much interest for the appearance of this competition ever since it was announced that the Council of Almoners of Christ's Hospital had secured a site for their proposed new building near Horsham. That it must prove a competitor of the day, if not epoch-making, at least more than a nine-days' wonder, was a foregone conclusion; but we hardly anticipated an array of seven judges or assessors, of varied shades of opinion, and, doubtless, very diverse tastes—possibly capabilities.

One fears that the voice of the one architectural assessor may be somewhat lost in the six-sevenths of non-professional opinion that will be given. I fancy that a proportion of two-sevenths of architectural elements would have been more to the interest of the Almoners, and that had the assistance of Mr. Henry Currey been secured in addition to those able gentlemen appointed, the Council would have had cause for self-congratulation.

We need by no means be averse to laymen as judges, providing that they form the rank-and-file of the adjudicating board, and are well and sufficiently officered, so to speak, by experienced architectural assessors. If the lay element is to swamp the professional, however, evil must follow.

The £100 allowance to each competitor is very liberal, and *should* be so when we consider the labour involved in the work of preparing the plans. The competition advertisement gives some idea of the extent of ground the new "hospital" will cover. As to style, I rather fancy that Tudor will be the thing—Free or *fin-de-siècle* Tudor, let us call it.

There is really a rush of competition work. Already several are in hand; last week we noticed the St. Pancras competition, and now here is a budget comprised of the new Blue Coat School, a County Council hall in Yorkshire, and new baths and wash-houses for Chelsea. The one hailing from West Riding is in itself an important affair, with premiums of £200, £100, and £50. I see that no assessor is mentioned in connection with the new baths for Chelsea. In view of recent happenings, we should like to see such an individual definitely appointed.

Mr. Waterhouse, I read, has been declaring against the chronic plague of advertisement posters. And quite as good an art critic defends such "ads," and pronounces them to be a "cheerful," if common, objects in the Queen's highway and other places.

The Panama Canal scheme has proved a veritable bubble. Probably had not the redoubtable M. de Lesseps been connected with the venture the bubble would have burst years ago. Many will call to mind the tenour of the occasional reports on the progress of the works that appeared in the daily Press. Tales of rotting machinery, blunders, futile endeavours, and other things scarcely encouraging to shareholders have been plentiful. For M. de Lesseps one is sorry, though we know that, come what may, the Suez Canal will certainly tide him over any difficulty connected with the Panama Canal; but the affair as a whole shows that "the triumph of mind over matter," of which we hear so much nowadays, is not so complete that mankind can become boastful.

Large derricks on high stagings are really very picturesque things. There are two beauties in a new job somewhere over against the St. James's Hall. One I note as possessing a decided flavour of the weird, with its mammoth boiler-chimney and open fire-door glowing in the winter twilight through driving clouds of steam.

The new pier works at Brighton do not progress

with remarkable rapidity. Their condition this week seemed to me little in advance of a month ago. These certainly are not good-working days, particularly for sea work; otherwise the building of light piers should not be a very lengthy operation.

I heartily sympathise with your correspondent, Mr. Herbert Wade, and with all other architects similarly situated. There appears to be only one method of procedure. Hold yourself aloof, and let the public see that you are independent of both them and the rabble who trade as architects. It may mean trial and struggle, but the time will surely come when people will recognise the architect, and know him from the charlatan and impostor. I speak with full personal experience of such positions as that of your correspondent.

I hear that the old Market Hall at Tonbridge is encompassed by several desirous of its destruction on the plea of making more room in the High-street. The picturesque old building was recently illustrated in the *Graphic* by an admirable pen-and-ink drawing by Mr. W. B. Boulton. With the adjoining famous "Chequers" Inn, the hall makes a fine picture, and Mr. Boulton has selected the most effective point of sight. There is a scheme at Tonbridge for pulling down much of the old High-street, and rebuilding the street with an increased width. It is not easy, however, to see where the old Market Hall offends, any block on market-days being in the narrow roadway rearer the railway station.

Great improvements are promised at Dover. The next session of Parliament will see several applications for works at this seaport. The most extensive scheme is the construction of a marine drive and promenade between Dover and St. Margaret's Bay, a distance of three or four miles. This is a private enterprise, and is estimated to cost little less than £200,000. The formation of a sea-wall and building sites is contemplated. The Corporation of Dover have decided to proceed with their street improvement scheme inaugurated last year, and will apply for further powers to enable them to make a new thoroughfare and widen one of the main arteries of the town, an outlay of £50,000 or £60,000 being contemplated. Besides these projected works, a contract for £115,000 has just been entered into for the first portion of the new harbour, which will cost at least another quarter of a million to complete. The South-Eastern Railway Company, too, are to be abreast of the times—at Dover, if not elsewhere—and have obtained the necessary powers for acquiring extensive property at the west end of the town for the erection of a new terminus.

A limited company that during its seven years existence has paid no less than 85½ per cent. on the total share capital, and whose profits it is anticipated will, during the coming year, balance the whole subscribed capital, is a noteworthy and comfortable exception in these dreary days of declining business and lamentable liquidations. If Mr. Robert Boyle's exhaustless energy and perennial good luck remain with his company, the happy shareholders of Robert Boyle and Son, Limited, who, I see, met to congratulate each other at the City Terminus Hotel on the 16th inst., may fairly hope, one of these days, to see their holdings become as valuable as New River Shares. Some of the contracts carried out by the company are colossal ones, and the profits are, no doubt, handsome; but one of the best signs in connection with the concern is that, while able to divide these handsome returns, no opportunity is lost of adding year by year substantial amounts to a reserve fund, which, as it stands at present, is a solid guarantee against the evils associated with the sanguine improvidence that eats all its cake as soon as it is earned.

The special tribunal set up under the County Council Act of 1890 to settle line of frontage cases, has already had several cases before it. The tribunal as at present constituted—viz., Mr. Arthur Cates (Vice-President Royal Institute of British Architects), Mr. F. C. Shoppee (President Surveyors' Institution), and Dr. Longstaff (London County Council), heard an appeal last week in respect of the line of frontage to a large corner plot of building ground at Camberwell. The superintending architect of the County Council (Mr. T. Blashill, F.R.I.B.A., F.S.I.)

and Mr. Reynolds, surveyor to the Camberwell vestry, being present, and Mr. P. E. Pilditch, of Messrs. Chadwicks, architects and surveyors, representing the appellant and Mr. W. D. Belcher an adjoining owner. The decision was reserved, but it was forthcoming within a very few days—indeed, the despatch with which the decisions of the tribunal have been given has been a source of considerable satisfaction to those surveyors who, on their clients' behalf, have had to appear before it. The profession generally, being aware of the great demand upon the time of these lay judges, speaks in the highest terms of the public spirit which prompts them to spend so many valuable hours of their time in entirely unpaid labour. GOTH.

CHIPS.

The memorial hospital and institute at Almondsbury was opened by the Duchess of Rutland on the 16th inst. The building is L-shaped on plan, modernised Queen Anne in style, and built of local bricks with freestone dressings. Mr. C. E. Ponting, of Marlborough, is the architect, and Mr. Perkins the builder.

Receiving orders have been granted in the cases of Joseph Clever, of 54, New Broad-street, E.C. and 7, Richmond-terrace, The Level, Brighton, architect; and of Frederick Billings, St. Mary Cray, architect.

Two blocks of schools are about to be erected in Bournemouth for a school committee. For that in Malmesbury Park district the tender of Messrs. George and Harding, of Bournemouth, has been accepted at £1,911; and for that in Gladstone-road, Boscombe, the tender of Mr. W. Hoare, of the same town, has been taken at £1,535.

The foundation-stone of new schools in connection with the Roman Catholics, at Shelfield, were laid last week. The building is from the designs of Mr. S. Loxton, and is being erected by Mr. Bantock, Walsall. The cost is £530.

The Clason Memorial Free Church, which has been erected in the south district of Motherwell at a cost of £2,000, was opened on Friday. The church is in Gothic style, and is seated for 600 persons.

Dr. Giulio Salviati and Mr. Arthur Crofts Powell have been presented by the Glass Sellers' Company with the freedom "as a mark of acknowledgment and high appreciation of their successful efforts to improve and develop the manufacture of artistic glass wares."

At Carpenters' Hall, on Friday, Sir Douglas Galton, K.C.B., D.C.L., gave a lecture on "Ventilation, Warming, and Lighting of Private and Public Buildings." Sir Douglas Galton commenced by asking, What was pure air? and proceeded to answer the question. In every condition there was dust in the air—of course, much more in towns than in the country; still, even on the mountain top there was dust. If there were no dust there would be no fog. The amount of impure air "permissible" in a room was referred to, and the lecturer went on to show that every care should be taken to get the air as pure as possible.

George Price Dicken, farmer, of Ruabon, was committed for trial at Wrexham on Friday, on a charge of publishing a defamatory libel on a postcard, concerning Mr. Henry Jenks, manager and director of the Ruabon Brick and Terracotta Company. The writer of the card described the prosecutor as a company floater and felon, and said he had been one of his thieves. The prisoner had admitted writing the postcard, and declared it was the truth.

The Old Meeting House, Norwich, now used as a Congregational church, has been reopened, after extensive alterations. The building has been entirely re-seated, the old oak having been re-used as far as practicable. New floors have been laid to gallery and ground floor, and the aisles have been paved with wood blocks. The contractor for the work was Mr. G. E. Hawes, and the architect Mr. J. Pender West, of the firm of Pearce and West, Lowestoft.

Mr. T. F. Tickner was the architect to the proposed new schools in Brickkiln-lane, for the school board for Foleshill, near Coventry, the contract for which was cancelled by the present board. Mr. Tickner sent a claim for compensation and for work done, and after some months' delay the school board examined his claim. The clerk gave the result of the scrutiny, stating that the chairman and himself, who were deputed by the board to inquire into the matter, had decided to disallow several items, such as claims for attendance, and they had come to the conclusion that Mr. Tickner was legally entitled to a sum of £73 9s. Mr. Tickner had consented to receive this sum in settlement of all claims, but he would not bind himself to the engagement unless a cheque was drawn that night. After some demur a cheque was drawn for the amount.

COMPETITIONS.

BRIXTON.—The Baths Commissioners of Lambeth have purchased the Polytechnic Institution in Ferndale-road, Brixton, for £8,000, for re-conversion into public baths, for which the premises were originally erected. The commissioners instructed three architects to prepare designs for a complete set of baths and wash-houses, preserving the existing swimming bath as a cheap second-class bath, and adding a first-class swimming bath for men, an extra swimming bath for women, private separate baths for both men and women, a Turkish bath, and accommodation for ten washers, with space for increasing the number of washers. The three architects—Messrs. Aldwinckle, Bell, and Tiltman—all sent in designs, which were referred to Mr. Henry Currey for his opinion as assessor, and he placed the competitors in the following order—viz., first, Mr. A. Hessel Tiltman; second, Mr. T. W. Aldwinckle; third, Mr. C. Bell. The purchase for the site being added to Mr. Tiltman's estimate of £14,500 for alterations will give a total of £22,500, and if to this is added the architect's commission of 5 per cent., and the expenses of the purchase and other incidental charges, the gross amount will still not exceed £25,000, and if to this sum is added £5,000 to allow for alterations and possible improvements to the design, and as a margin for the builder's tenders exceeding Mr. Tiltman's estimate, the amount altogether will not exceed £30,000 in all. The vestry have approved the agreement, and have given permission to the commissioners to borrow the sum of £8,000 to defray the purchase money.

THE BURNS STATUE FOR CHICAGO.—Mr. W. G. Stevenson, A.R.S.A., Edinburgh, has been informed by Mr. W. Gardiner, the treasurer of the Chicago Burns Monument Association, that his model of the poet has been selected from the thirty designs sent in for competition. The committee have about £3,000 in hand to expend upon the monument, and the sculptor has undertaken to execute a statue in bronze 11ft. high, with a granite pedestal about 12ft. high displaying bas-reliefs illustrative of scenes in the poet's works. The design represents the bard standing, his right hand holding a pencil and grasping the lapel of his coat, while in his left rests a note-book on the corresponding limb. Both the head and the costume will be modelled from the Nasmyth portraits.

KILLARNEY.—A PRINCIPLE PREMIUM.—The town commissioners of Killarney received at their last meeting a report from a committee as to the proposed Town Hall. They recommended that a site in Ballyvalley-lane be leased for 300 years at an annual rent of £300, and that upon this plot they should erect a building of one story, having in front two rooms suitable as commissioners' private offices and as committee rooms; in the centre one large hall, 94ft. long by 33ft. wide, and at the back two retiring-rooms, fitted with w.c.'s and lavatories. The committee added: "A prize of, say, £1 [!] to be offered by public advertisement for a plan, specification, and estimate, the rejected plans, &c., to be returned, and those accepted to become the property of the commissioners." It is a pity the committee could not be persuaded to raise the premium to a guinea, as such a sum would have looked more professional. We regret to add that, although the report stated that the ratepayers were unanimously in favour of the scheme, it hangs fire, its consideration having been adjourned as some of the commissioners were not satisfied that the best site had been selected.

WALSALL PUBLIC BATHS.—The General Purposes Committee have passed a resolution recommending that the plan of Mr. H. T. Bonner for the public baths be carried out, subject to the detailed specifications being approved by the committee, and to its being found, on tenders being obtained, that the work can be carried out by approved contractors at a total cost not exceeding £7,700.

A new parish church is to be erected at Troon from plans by Mr. H. J. Blanc, A.R.S.A., architect, Edinburgh. The present edifice dates from the end of the last century.

The sum of £6,000 asked for by the Dean and Chapter of Gloucester Cathedral to enable them to put the exterior of the building in a proper state of repair, has been raised, and the work is in active progress, under the direction of Mr. F. Waller, the cathedral architect.

Building Intelligence.

BRISTOL.—Further building developments at the University College are in progress in the erection of an engineering wing, to which the city council have contributed £2,000. It is expected to be finished early next spring. On the ground floor are to be a workshop and casting-shop, with a large boiler-house attached. On the two floors above are lecture-rooms, drawing, and class-rooms. The engineering wing will form one side of the future great quadrangle which is included in the complete design of the college buildings. Mr. F. Bligh Bond is the architect, and Mr. W. Church, Wapping, Bristol, the contractor. A medical wing is also in course of erection at the college from Mr. Bond's designs, Mr. G. Humphreys, of Stapleton-road, Bristol, being the contractor.

LINCOLN.—The foundation-stone of the new R.C. Church of St. Hugh was laid on Friday. The church will face Monks-road, and the style is Early English. The walls are of brick, faced externally with Greetwell stone, and covered internally with plaster, for the purpose of future coloured decoration. The dressings are of Douling stone. The columns on exterior, and to the nave arcade, are to be of red Corsehill stone, the latter having Portland stone bases. The church will seat about 500, and consists of a nave 87ft. by 35ft., with clerestory, processional aisle, and chapel on each side. There are also a sanctuary, 30ft. by 30ft., organ chamber, 21ft. by 20ft., and two sacristies and baptistery. The tower and spire will rise to a height of 140ft. above the ground. The contract has been taken by Messrs. H. S. and W. Close, contractors, of Lincoln, and will be executed from the designs and under the superintendence of Mr. Albert Vickers, 151, Strand, W.C.

LINTHORPE, MIDDLESBROUGH.—On Saturday the Archbishop of York consecrated the Church of St. Barnabas, at Linthorpe, Middlesbrough. The church is as yet in an unfinished state, the chancel, organ chamber, and south aisle having yet to be built; but the nave, two aisles of six bays, and south porch having been satisfactorily completed, it was thought advisable to have the building consecrated for divine service. The cost of the church so far amounts to about £3,000. In a few months the building of the chancel will be proceeded with, a work which is expected to cost £1,500. The church is built of brick, with stone dressings. The seats are of dark stained wood, and accommodation is intended in the whole church for 750 persons, the portion already built accommodating about 500. The architect is Mr. C. Hodgson Fowler, F.S.A., M.A., Durham; and Mr. W. Bastiman, Linthorpe, Middlesbrough, is the sole contractor.

MOLD.—A new English Presbyterian church and schools are erected on a site near the railway station. The style of the building is Gothic, and it will seat over 450 persons. The front portion is semicircular on plan, and the sittings are arranged in a gallery form, with stepped aisles leading to the body sittings. The school buildings are at the rear, and contain, on the ground floor, a schoolroom to accommodate 200 persons, three class-rooms, and a minister's vestry, with conveniences. A large schoolroom is constructed over the latter, capable of seating 250 persons, the access to same being from separate staircase and entrance in Westminster-road, with doors opening outwards for cases of emergency. The main feature of the building is a tower placed at the angle of Chester-street and Westminster-road, which is square at the base and tapers in an octagonal form to an octagon stone spire. The contractor is Mr. Thomas Roberts, Wrexham-street, Mold; the clerk of works being Mr. John Roberts, of Ruthin. The architect is Mr. T. G. Williams, 3, Cable-street, Liverpool.

PRESTON.—New Central Industrial Co-operative Stores erected at the junction of Lancaster and Ormskirk-roads were opened on Friday. The buildings cover an area of 300 square yards, and, exclusive of cellars, are three stories high, with store-rooms, in addition, in the roof. The ground floor, 14ft. in height, is arranged as three shops. The first floor rooms over the three shops will be used as showrooms; they will be reached by a pitchpine staircase, with mahogany newels. All the fittings and joinery on these floors are of pitchpine. The workrooms on the second floor

are approached from the back by a separate staircase. The basement cellars have floors finished in concrete, and lighted with Hayward's semi-prism lights. The buildings are heated throughout with hot water on the low-pressure system, and ventilated by vertical inlet tubes, air-extracting flues, and Boyle's air-pump ventilator. The elevations are treated in the Renaissance style, with piers, caps, arcading, and cornices on the ground floor, executed in York stone. The remaining portions of the elevations have been carried out with Edwards's Ruabon red pressed bricks. The buff terracotta work throughout, as also the enriched and modelled work, was supplied by the Leeds Fire Clay Company, Limited, from their Burmantoft works. The mosaic floors in the entrance vestibules have been provided and laid by Messrs. Craven, Dunnill, and Company, Limited, of Jackfield, Shropshire. All the remaining trades were executed by Mr. John Walmsley, of Theatre-street, Preston, to whom the contract was let. The stores have been erected from designs prepared by Mr. William D. G. Mumford, architect, 33, Guildford-street, Preston, and under his personal superintendence.

RAWDON, WEST RIDING.—A new Baptist chapel at Rawdon, adjoining the Sunday-schools erected in 1884, was opened on Wednesday week. It is of the modified Classic type that prevailed in the middle of the last century. It is 78ft. by 37ft. and 27ft. in height, with two shallow transepts that may be extended when further accommodation is required. There is an end gallery three seats deep, approached by a staircase from the vestibule. At the opposite end there are the organ recess, the seats for the choir, the baptistery, and the pulpit, together with vestries. Two large rooms are provided over the vestries for young men's classes. These rooms, as well as the chapel, have direct communication with the schools. The chapel seats 450 worshippers. The external walls are of tooled ashlar and dressed stone. The pulpit and pews are of polished pitchpine. The works have been carried out under the superintendence of the architects, Messrs. T. H. and F. Healey, of Bradford. The contractors for the various works are:—Messrs. W. Fleisher and Sons, masons; Mr. J. Taylor, joiner; Messrs. G. and R. Nunn, plumbers; Mr. Dixon, plasterer; Mr. J. Richardson, slater; and J. Roome, painter. The cost, including furnishing, amounts to £3,600.

CHIPS.

The Wesleyan chapel at Epsom has been reopened after enlargement, at a cost of £2,000. The style is that of Early English. The additions comprise new aisles, chancel, organ-chamber, ministers' vestry, enlargement of the store-room, tea-room, and warming-chamber. The church now seats nearly 400 persons. Mr. George Gray, of High-street, Egham, has carried out the contract, from the design of Mr. James Weir, of Victoria-street, W.

Chacewater Church restoration draws near its completion, and the date for reopening has been fixed for Tuesday, 20th December. The work has been carried out from the designs of Mr. Edmund Sedding, architect.

The new town-hall at Kilmaurs, N.B., was opened on Friday. The building is a two-storied edifice in front, with the hall proper running back at right angles to the front elevation. On the ground flat of the frontage are situated the janitor's house and a public office. A staircase gives access to a reading-room and recreation room, which occupy the whole area of the second flat. The hall proper is 58ft. by 30ft., and 20ft. high, and is seated for 450 persons. The architect is Mr. M'Houll, Kilmaurack.

The scheme for the bridging of Alcaig Ferry was discussed at a joint meeting of a committee of the town council, when it was agreed that the scheme should be proceeded with, and Mr. Fraser, C.E., Inverness, was instructed to prepare plans and specifications. The Alcaig Ferry is at the head of the Cromarty Firth, which separates the Black Isle from Dingwall, necessitating a journey of about six miles to those who wish to come into the town. The part of the Firth which is to be bridged is three-quarters of a mile broad, and the estimated cost is from £8,000 to £10,000.

The architectural classes of the Glasgow and West of Scotland Technical College have been sketching and measuring in the Glasgow Cathedral during the Saturday afternoons. Visits have been paid to Queen Mary-street and Dalmarnock-road new public schools, where 60 students attended; while on Saturday last 70 students were present at the visits to the new portion of the Victoria Infirmary.

Engineering Notes.

DOVER.—Application will be made next session for powers to construct a marine drive and promenade between Dover and St. Margaret's Bay, a distance of between three and four miles. The undertaking, which is due to private enterprise, is estimated to cost little short of £200,000. It contemplates the blasting of a portion of the high cliffs, and the building of a sea wall in order to obtain building sites besides a marine drive, the situation having a southern aspect. In addition to this the Corporation have decided to continue the policy of street improvements in the heart of the old town inaugurated last year, and also to apply for further powers to enable them to make a new thoroughfare, and to widen one of the main arteries of the town, the cost of which is estimated at £50,000 or £60,000. A contract for £415,000, has also just been entered into for the first portion of the new harbour, which will cost at least another quarter of a million to complete; and the South-Eastern Railway Company have obtained powers to acquire a large extent of property at the western end of the town for erecting a new terminus.

CHIPS.

Mr. Usill's paper, which, as advertised on our front page, was to have been read at the meeting of the Society of Architects next Tuesday, is postponed, owing to that gentleman's ill-health. Some other paper will be found no doubt before Tuesday.

At Worcester, on Friday, a builder named Sumner was sentenced to eighteen months' imprisonment for soliciting a man to set fire to the prisoner's property with intent to defraud an insurance company.

At Stonehouse Bankruptcy Court on Nov. 16th, before Judge Edge, the application of John Reed, builder, Plymouth, for discharge, was further adjourned for six months, owing to the difficulty of winding up the estate.

The organ in Hereford Cathedral, which for a long time has been undergoing restoration and extension, under the direction of Messrs. Willis, was reopened on Tuesday. The cost has been over £2,000.

An organ has been erected in Mayfield Parish Church, Edinburgh, at a cost, with its accessories, of nearly £1,000. It is by Messrs. Brindley and Foster, of Sheffield, and occupies the north transept.

The ventilation of the new laboratory, Queen's College, Belfast, is being executed by Messrs. Baird, Thompson, and Co., London and Glasgow, their patent "Grahtrix" ventilators being used for the extraction of the vitiated air.

Next session a Bill is to be introduced seeking powers for the construction of an underground electric railway, commencing close to Clapham Junction and passing thence *via* South Kensington, to a point near the Great Western Railway Company's terminus at Paddington. The proposed railway is an extension in the direction of Clapham Junction of the South Kensington and Paddington Subway scheme, which was promoted in 1891, but withdrawn.

Messrs. Stephens, Bastow, and Co., Limited, of Montpellier, Bristol, have received orders for the erection of additions to the Marlborough College, at a cost of £12,600. The same firm built the chapel for the same college, under Messrs. Bodley, A.R.A., and Garner, Gray's Inn, London, who are the architects for the present work.

In consequence of the application of the Evesham Town Council for sanction to borrow £1,550 for works of sewerage disposal, a Local Government Board Inspector, Mr. F. H. Tulloch, A.M.I.C.E., conducted an inquiry into the subject matter of the application at the Town Hall, Evesham, on Friday. Evidence was given by Mr. T. Cox (town clerk) and Mr. Candy, who explained the ferocious and polar process of sewage, which it is proposed shall be adopted, followed by filtration.

A new Wesleyan chapel was opened at Bideford on Friday. The treatment is Classic, and the chapel seats 1,015 people. The building is about 70ft. by 50ft. The whole of the seats are arranged at such an angle that every sitter faces the preacher. The seats, stairs, rostrum, and other woodwork are of pitch-pine. Local stone is used for the building, with Bath stone dressings. The architects are Messrs. Habershon and Fawcner, of London, Newport, and Cardiff; and the contractors Messrs. Cock and Lamerton, of Bideford. The cost of the undertaking—which includes the transformation of the old chapel into schoolrooms—is estimated at about £6,000, of which the new chapel, for building and fittings, will absorb about two-thirds.

Correspondence.

"THE COUNCIL BROADWAY."

To the Editor of the BUILDING NEWS.

SIR,—In the article entitled "The Council Broadway," in your issue of the 19th inst., you state that it appears to you "that such an important question as the approval of designs should be left to a small representative committee of the greatest architects of the age, and that such a committee (say of three) should be drawn from the ranks of the Royal Academy and the Royal Institute of British Architects."

There are several objections that might be raised to this proposal. It is, firstly, a matter of grave doubt that it is possible to draw from the ranks of the Royal Academy, and more especially the Royal Institute of British Architects, the "three greatest architects of the age."

Do paying a small annual fee, and passing the Institute examinations (which nearly, or probably all, the leading members escaped by joining before the examinations were instituted) constitute the qualifications of a leading architect? Why should not a man who has not paid the above-mentioned fees to be enrolled on the books of the Institute be equally competent with any F.R.I.B.A., or even the President himself, to act as a member of the suggested committee? It must by no means be supposed that the confidence you repose in the Institute is universal.

The *Spectator* of November 19, in an article on the "Royal Institute of British Architects and its Critics," states that "The best English architects of our day are almost, without exception, to be found outside the Institute. To anyone with a knowledge of the art it is enough to name Messrs. Norman Shaw, John Bentley, G. F. Bodley, Philip Webb, T. G. Jackson, and Basil Champneys."

That this view is common among a large number of architects is shown in the circumstance that they withhold themselves from the Institute.

—I am, &c., CHARLES C. ROBIN.

357, Liverpool-road, N., November 22.

VICTORIA CATHEDRAL COMPETITION.

SIR,—My attention has been called to some paragraphs in the BUILDING NEWS referring to the above competition. May I be permitted, through the medium of your valuable paper, to say a few words on the subject to those who are interested in that competition?

There was a desire, in framing the conditions, to secure a perfectly fair trial, and to avoid those errors which had been repeatedly pointed out by professional men to have occurred on similar occasions. The selection of our professional assessor, Sir Arthur Blomfield, was strictly adhered to. The order of merit of the three premiated designs was "Fides," "New and Old," "Ars." With reference to the first of these, the assessor's actual words in his report were:—

"The plan is in most respects better considered than that of any other, and seems to provide all that is wanted in a church of this size, which has to combine the requirements of a cathedral with those of a parish church."

"The appearance, both externally and internally, would be sufficiently imposing and effective."

"It appears to me to be more free from obvious defects than any other."

These quotations will, I think, justify the committee in their choice. Speaking from the point of view of a mere amateur, and with great reverence for the opinion of properly qualified specialists, I must say that while all three designs appeared to me greatly superior to the others submitted, and, while each exhibited interesting features and advantages not possessed by the other two, that of "Fides" certainly seems best adapted to the purpose for which we wanted it, and the site which the building has to occupy.

"New and Old," if deprived of its elaborate and beautiful accessories, would lose half its charm, and is really, if I may be allowed the expression, too "bizarre" for a colonial cathedral.

"Ars" does not provide on plan such facilities as those afforded by "Fides," though no one can fail to appreciate the general beauty of mass in its elevation.

"Fides" has a sober, dignified exterior, securing the most that can be obtained of cathedral-like effect with the limited funds at

our disposal; and I feel sure that anyone who is familiar with Gothic buildings on this side of the Atlantic will be thankful for such an addition to existing specimens of church architecture.

In conclusion, I must tender the apologies of the committee for delays which, though aggravating to competitors, were unavoidable.—I am, &c.,

ARTHUR BEANLANDS,
Canon and Rector, Christ Church Cathedral,
Christ Church Rectory, Victoria, B.C., Nov. 4.

DIVISION OF BUILDINGS.

SIR,—You will, I am sure, allow me to point out a mistake in the latter part of your article of last week under the above heading.

The question at issue in the case referred to had nothing to do with the thickness of walls, nor was it at all the question, "What is a warehouse?" It is fully and fairly set out in the whole of the article except the last paragraph, and as the matter is still under notice of appeal, I will not refer to it further.

But I do wish emphatically to contradict the statement that the alleged irregularity was not discovered until the building was far advanced. As soon as I saw the plans at the commencement of the works, I wrote both to architect and builder, pointing it out, and as soon as I could legally serve the notice to amend I did so, and the subsequent proceedings took their usual and proper course.—I am, &c.,

THE DISTRICT SURVEYOR.

96, Gower-street, Nov. 22.

MOVING MASONRY HOUSES IS ECONOMICAL.

SIR,—There seems to be a lost opportunity just now occurring of providing cheap central housing for a number of workmen. Two houses, of four stories above ground level, in Great Russell-street, which, it is stated, were newly built within the last 30 years, are now being pulled down to make room for larger houses on the "flat" arrangement. If these two houses were moved bodily back on the rear of the same plot, or to an adjoining plot on Gilbert-street, which would only cost about one-fourth of similar new buildings, taking account of the rental value of the extra time which the latter would consume, an opportunity for cheap rents could thus be obtained.

It seems that architects and contractors undervalue the progressive tendency of bodily house moving by wrongly considering that it will deprive them of so much work; but they thus overlook the fact that the dead loss which pulling down houses entails is often a serious barrier to substituting buildings of a better class on their sites.

If "housebreakers" added to their vocation that of bodily house moving, and the London County Council had the power to permit such removals without undue inconvenience to the public, there might be some prospect of reform in this line. It would also be a check upon the "improvement dodge" of some unprincipled house owners, who are disposed thus to pick the public pocket when new thoroughfares or streets are proposed for public convenience.—I am, &c.,
A. B.

THE TROUBLES OF A PARSON WHO UNDERTOOK TO BE HIS OWN ARCHITECT.

SIR,—Many of your readers will read the following clippings from one of the best-known newspapers in the West with interest:—

Western Morning News, Tuesday, Nov. 15, 1892:—

The circular ribs, trusses, pitchpine, chancel screens, choir stalls, and seating, used in the restoration of Bradstone Church, were supplied from the Eagle Steam Joinery Works, Plymouth, and the work was carried out under the superintendence of Mr. John Oliver, Weire House, Lifton.

Western Morning News, Nov. 18:—
BRADSTONE CHURCH.

SIR,—With reference to the paragraph which appears in your issue of to-day, I beg to state that the only truth contained therein is that the woodwork mentioned was supplied by the firm named. This fact was stated in the account furnished by a friend of the opening of the church, and doubtless was accidentally omitted by you, as was another thing—viz., that Aspinall's water paint was most successfully used in the decoration of the chancel.

I supplied the designs for the whole of the woodwork, which, though roughly given, were ably caught at and carried out by the foreman of the Eagle Steam Joinery Works. I superintended the whole work. The seats were fixed by workmen from Lifton Park. The screen and choir fittings by George Gidley, the able workman of Mr. Bariball, of Lewhitton. John Oliver is a worthy and

good plasterer and mason, and did his work to my satisfaction. But not a day passed without my superintending his work. Since names have been mentioned, I ought to add that the decorations of the chancel were the work of Mr. Bennett, of Launceston.—Yours truly,
November 15.
THE RECTOR OF BRADSTONE.

Western Morning News, Nov. 17:—

Sir,—In reply to the letter of the Rector of Bradstone, appearing in this morning's issue of your valuable paper, I think, in common fairness to myself, it should be known that the whole of the restoration work done in connection with the above church, with the exception of that in the chancel and one small doorway in the church, discovered as the work proceeded, was carried out by me, under a contract between the rector and churchwarden of the parish and myself, and having Mr. Bullen, the estate carpenter of Lifton Park, nominated in said contract as the one to finally approve and adjust the account, and who has done so, and is quite satisfied with my carrying out.—Yours truly,
JOHN OLIVER.
Weir House, Lifton, 16th November, 1892.

Western Morning News, Nov. 18:—

Sir,—I write with the contract of "John Oliver, of the Weir Cottages, Lifton," before me, which has only to do with pointing, plastering, and colouring, with the exception of a new west door and a piece of flooring which were done for him by Mr. Barriball of Lawhiton. John Oliver in his first estimate was so far out of reckoning that it was agreed that Mr. Bullen, employed for long years at Lifton Park, and well known as a very able man, should measure up the work. There is no proviso that it should be done to his satisfaction.

John Oliver is completely wrong in saying that a small doorway was discovered during the process of the late works. I discovered this, which led originally to the roof-loft, and an old south doorway nearly five years since, when Mr. Yole, of Treadwell, was doing work in the church for me. If John Oliver had not claimed that to which he has no right, which put all others employed by me completely in the background, I should not have noticed his ridiculous paragraph in your issue of Tuesday last.
THE RECTOR OF BRADSTONE.

Western Morning News, Nov. 19:—

Sir,—Allow me to correct the Rector as to his observations in your valuable paper to-day which he says has only to do with pointing, plastering, and colouring, which is not correct. I will now give you an outline of my contract. Firstly, take down old boarded ceilings to north and south aisle, point slate roofs, replaster same, re-dress interior of tower and point same, clean off and re-dress column arches and point same, clean and re-dress porch and point same, repair and fix new steps to entrance gates, take up old flooring and relay new in south aisle, new pitch-pine tower door with oak fronts, refix font, repair plaster and colour interior of church, all roofs stained and varnished; secondly, re-seat the whole interior of church from plans prepared by an Exeter builder, who gave a price from same for £43, which was not accepted by the Rector, but the same plans, with an addition of improved seat ends, taken from a periodical, which, after some consideration, was accepted from me. For all of the above work the men were employed and under my charge, and paid by me. Respecting the Tuesday's paragraph in your paper, I know about it. Respecting my prices, they have not been altered from the first, and I consider Mr. Bullen was nominated to overlook the work in consideration of the Lifton Estate giving the sum of £40 towards the restoration.—Yours obediently,
JOHN OLIVER.
Weir House, Lifton, November 18th, 1892.

Western Morning News, Nov. 21:—

Sir,—John Oliver's letter is a tissue of exaggerations, and grossest misrepresentations, and as such is unworthy of further notice by me.
THE RECTOR OF BRADSTONE.

I might add to this story of a storm in a teacup that, according to Crockford's "Clerical Directory" for 1892, the rector of Bradstone is the Rev. Neville George Murray Lawrence, M.A. He has held the living since 1887, before which he was successively English Chaplain at Toulon and Freiburg.—I am, &c.,
Exeter, Nov. 21.
HARRY HEMS.

The Ryton-on-Tyne local board have just appointed a surveyor in the place of the late Mr. Salter. There were upwards of 100 applicants, and the board have selected Mr. John Palmer Dalton. The new surveyor has been for several years assistant surveyor at Jarrow. His father was one of the pioneers of the movement for establishing local boards in North Durham, and his brother is clerk to the Blaydon and Benwell local boards.

A meeting of a committee of the town council of Arbroath was held on Monday with regard to the destruction of the parish church by fire on Monday week. It was resolved, before doing anything in the matter, to take the opinion of eminent counsel, particularly in view of a decision which was given in the Court of Session in 1883 by Lord McLaren in a case which was raised by the minister of the parish claiming a glebe. In the decision referred to, which became final, his lordship refused the minister's claim, on the ground that the church of Arbroath is a purely burghal church. The congregation have meanwhile obtained accommodation in Ladyloan *quod sacra* parish church. The object of the present memorial is to ascertain whether or not the church is purely burghal, with the view of determining the obligation of the magistrates and community as to its restoration.

Intercommunication.

QUESTIONS.

[10892].—**Building Societies**.—I shall be glad of information as to the law of the State of New York, whereby the Government have the power to send an inspector to any real estate company, having an office or carrying on business in the State of New York, with authority to inspect the books and affairs of the company, and to test the value of the securities; and the society or company failing to give satisfaction to the inspector, such company is immediately closed, so far as New York State is concerned, under heavy penalties.—ROBERT MELLORS, Bridlesmith Gate, Nottingham.

[10893].—**Floor Boarding**.—The boarding for a house was specified, amongst other things, to be wrot and 1 1/2 in. thick. The builder has supplied boarding which is exactly 1 1/10 in. thick, which he says is the 1 1/2 in. boarding of the trade. I should be glad to know if there is any such trade understanding, or whether I can reasonably compel him to put the full thickness.—ARCHITECT.

[10894].—**Soiling Bricks**.—In the manufacture of London bricks, the clay is soiled—i.e. mixed with domestic ashes. Where these are unattainable, what other substances are used, in order of merit, to effect the same purpose?—L. H.

[10895].—**Lime**.—Given a limestone, how to ascertain the quality of lime which would be produced therefrom, and whether suitable for building or not. Also, to determine the class of stone, whether magnesian or otherwise.—L. H.

[10896].—**Assessment**.—I wish to read up the law and practice as to poor-rate assessments and appeals therefrom. Can anyone refer to books and authorities on the subject?—NOVICE.

[10897].—**Sgraffito**.—May I ask some reader to inform me where I can get full information for decorating with sgraffito? Are there any works published on the art, and is it very expensive?—NORTHERN STUDENT.

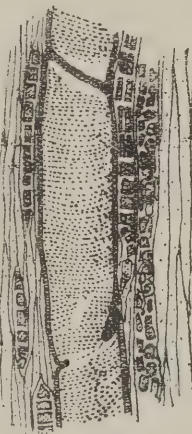
[10898].—**Rats**.—Can any of your readers give me information as to the best way of getting rid of rats in old walls and floors?—SUBSCRIBER.

[10899].—**Damp**.—I have recently erected a brick house, the outer walls being 1 1/4 in. thick, faced with pressed brick. During the late driving rains the water has come through the whole surface of the east wall. I should be glad of suggestions as to treatment. Is there any preparation which will leave the brickwork its present colour, and without glaze?—SUBSCRIBER.

[10900].—**Stoneware and Earthenware Pipes**.—Will one of your numerous readers kindly inform me what is the difference between stoneware and earthenware pipes? Will the same clay which is used for earthenware pipes do for stoneware?—FIRE.

REPLIES.

[10893].—**Position of Timber**.—I have to thank Mr. Harris for his last reply, p. 652; but in it he uses a much less definite description of the sap-valves than he did in his first on p. 478. Now he calls them "sap-valves or pores"; but surely valves and pores are two different



things. His original statement was: "The reason for placing staves inversely to their natural position in the tree is because the sap-valves open upwards from the root, and when thus reversed they prevent the ascent of moisture in the wood." This appeared to point to an arrangement similar to that of the valves found in the veins of the human subject, which prevent a back current in the venous blood. The wood of the ash having been pointed out as one of those where the sap-valves could be seen, I have examined numerous specimens of that wood, preparing them, however, neither with "saw" nor "axe," but, as usual, with a keen razor. Even that is all too clumsy an implement for some of the delicate membranes of the tissues. My search for the "sap-valves opening upwards" has been unsuccessful; but, bearing in mind the difficulty of proving a negative, in my opinion, all the evidence pointed to the conclusion that they are non-existent in any of the numerous specimens I have had under examination, taken from all parts of the section, from the pith to the

bark inclusive. At this point I feel that you, Sir, may reasonably cut short my story; but should you be willing to allow your readers to see the kind of evidence on which my conclusion is based, I send a drawing of a longitudinal section of one of the "valves or pores" indicated in Mr. Harris's sketch on p. 652. The section is cut tangentially to the dark radial lines, which are so conspicuous in a transverse section—the "medullary rays" of the botanists. I withhold other drawings as unnecessary for the present purpose. They were all made, with the aid of a reflector, from sections of the wood placed on the stage of a microscope; and the scale, by which the actual size of the parts can be measured, was drawn in like manner from a micrometer placed in the same position. The section of wood from which the drawing was made displayed an uninterrupted length of six cells or divisions of the so-called "valves or pores" one of which, with parts of two others, are included in the drawing. The cells average about nine-thousandths of an inch in length, and are lined with a membrane covered with dots of exceeding minuteness—the "pitted tissue" of the botanists. The cells are sub-cylindrical in cross section, and are joined end to end. The ends are sometimes square with the sides; but more frequently oblique, as in the drawing. These ends are originally complete, and form a true partition—the "septum" of botanists—between the adjacent cells. I found many instances where the end-walls of the cells were quite perfect, and the line of junction between clearly defined. In other cases these end-walls had been absorbed, leaving only a ring projecting round the inside of the cells. This absorption is somewhat capricious, and the series of six cells above-mentioned is a case in point, for of the five junctions between them three are perfect; but in the other two the rings only remain. In the drawing I have shown a cell which has its upper end complete, but at the lower end the walls have disappeared. I presume that it is at these septa that the "valves opening upwards" would be seen if anywhere, but I found no indication of such an apparatus, either in these or any other of the structures examined. The large pitted cells, as shown in the drawing, are embedded in a mass of elongated-cigar-shaped cells, pointed at the ends, composed of sparsely-dotted tissue, and densely packed together—the "woody tissue" of botanists. The squarish dotted cells show where the razor has cut across the medullary rays which extend radially from the pith to the bark. In sections cut parallel with these rays they constitute the "silver-grain" of the workman. The dots in these small cells do not represent pitted tissue, but a granulated substance with which they are loosely filled.—E. S.

[10873].—**Boasting**.—I am sorry to have aroused "A Mason" by my reply in this matter, and am always glad to be corrected, even when done in the manner of a week ago. However, I must be proved wrong (and authorities quoted) before I admit that "A Mason" knows very much about his business. In the first place, let me advise him to consult a dictionary of terms before correcting the orthography of the querist, and those of us who answered. In all the authorities I have been able to consult, Weale, Parker's "Glossary," "Cyclopaedic Technical Dictionary," "The Dictionary of Architecture" (issued by the Architectural Publication Society), Nicholson's "Cyclopaedia," and many back volumes of the Building News, the word is spelt as above, and not "boasted." Can "A Mason" quote any rebutting authority? Second, as regards the width of the chisel, the "Architectural Pub. Society's Dictionary of Architecture" (Vol. I.) defines "boaster, a chisel 2 in. wide in the cutting part, being one of the tools used by masons." Nicholson's "Cyclopaedia," 1859 ed., says that a "boaster or boasting-tool" is from 2 in. to 2 1/2 in. or 3 in. in breadth. Can "A Mason" refer to any authority where it is stated that the chisel is 4 in. up to 5 in. wide? Third, as regards the angle, I will withdraw the term "incompetent," and will observe that many men show idiosyncrasies in their workmanship, and the methods in different districts vary. Fourth, "A Mason" is asking us to believe too much when he says that the custom he mentions prevails "in the Midlands and North of England." This is too large an area of ground for any custom to prevail over. Is not herring-bone boasting common in Derbyshire? Is the term "boasting" ever mentioned in Cumberland or Northumberland specifications? Now, as regards the custom in the Manchester district, I have this week visited two stone-working yards, and asked to see a boasting-tool. I was shown in one case a chisel 2 1/2 in. wide, and in the other 2 in. wide. I then asked for a sample of boasting, and in both cases vertical marks were made, though upon asking whether they were made sloping, I was told that it was just as was directed by the architect or clerk of works. I asked for a boasting tool 4 in. or 5 in. wide, and was informed that they never used any wider than 3 in. In conclusion, let me say that I do not intend to argue the matter with "A Mason" unless he quotes reliable authorities.—THE ONE WHO TOLD.

[10881].—**Severn Tunnel**.—In reply to "Doubtful," the best information I am able to obtain as to the sort of bricks in which the arching of the Severn Tunnel is executed is contained in the following extract from "The Severn Tunnel: its Construction and Difficulties," by T. A. Walker, the contractor. He says, on p. 177: "No less than 78,450,000 bricks were used in the construction of the tunnel and bridges. These bricks were vitrified bricks, from the Catfircrook Brick Company, near New Passage, on the Bristol and South Wales Union Railway, from the Fishponds and Bedminster Company, near Bristol, from Staffordshire, and from our own brickyard, near the five-mile-four-chain shaft." If "Doubtful" can obtain the perusal of this book, I will promise him more romance and hair-breadth escapes than are contained in a hundred ordinary novels. In the current volume of this journal (July 29th, 1892, p. 140) will be found an account of the behaviour of the brickwork under the enormous pressure exerted by the external water. A description is given in an appendix to Mr. Walker's book (page 180); a description is given of the pumps, both temporary and permanent, and their positions. The temporary pumps numbered 80 at 9 pumping stations, and capable of raising 84 million gallons in the 24 hours; the permanent pumps numbered 16 at 6 stations, capable of raising 66,000,000 gallons per day; these, however, are not all at work regularly, some being in pairs working alternately, some only during wet weather, and others only in the winter season. "Doubtful" will find an article on the tunnel in the Building and Engineering Times.

for August 30th, 1884, and also a paper by Mr. T. A. Walker, read at the British Association Meeting at Manchester, and reported in *Engineering*, Sept. 9th, 1887, page 290.—**DEPUTY B.E.**

[10884].—**Framing.**—In Rivington's "Building Construction" (Part II. p. 416), "R." will find the following remark:—"Fine sand is sometimes thrown on to the last coat while it is wet, with a view to imitating the rough surface of stone." Of course, the last coat of oil paint is intended.—**GILBERT W.**

[10885].—**Ants.**—Dryness and warmth are conditions suitable to ants. Unless you can alter the conditions you are bound to be troubled with them.—**C. F. M.**

[10885].—**Ants.**—In "Enquire Within upon Everything," paragraph 2226, "Bothered" will find the following methods of destroying ants given:—"Drop some quicklime on the mouth of their nest, and wash it in with boiling water; or dissolve some camphor in spirits of wine, then mix with water, and pour into their haunts; or tobacco-water has been found effectual." Has "Bothered" tried the above? Another method is to make a mixture of tar and water, and pour into the nest. Inside the bakehouse the following might be tried:—Mix arsenic, sugar, and water in a plate; cover with a slate, leaving room for the insects to pass between slate and saucer. Lay a stone on the slate, and take all precautions to prevent any creature but the ants getting at the poison.—**GILBERT W.**

[10886].—**Breaking Weight.**—If $D = 8$ in. and $L = 12$ ft., then $BW = 221 \cdot 81$ tons. To reverse the problem and find the value of D we retain the same notation, and transposing we obtain—

$$D^4 = \frac{BW \times L^2}{781}$$

from which $D = \sqrt[4]{\frac{BW \times L^2}{781}}$

The value for BW should not be less than ten times the weight to be supported. "Student" does not state at what point of the beam the stresses are required. If at the centre of the span, under the conditions given, the formula would be $\frac{WL}{8D}$. I cannot determine whether

"Student" means his beam to be *encastré* or not. It is not usual to make any allowance for the web, and the omission besides is on the safe side. "Student" will find this question of "web" very ably treated in your articles "Iron Arches of Long Span."—**ESSEX.**

[10886].—**Breaking Weight.**—(1) This question formed part of the R.I.B.A. Exam. in March this year. The formula—

$$W = \frac{a \times d^4}{l^2}$$

is adapted only for pillars over 30 diameters high, which gives the resistance to bending (that force coming into action before crushing takes place). In pillars over 10 diameters and under 30 diameters high the strain is one of bending and crushing; therefore the formula for the breaking weight is—

$$BW = \frac{W \times C}{W + \frac{1}{2}C}$$

When $W =$ Breaking weight for pillars over 30 diameters high, in tons.

$BW =$ Ditto ditto over 10 and under 30 diameters, in tons.

$d =$ Diameter of the pillar in inches.

$l =$ Length in feet.

$C =$ Crushing strength per square inch (for red deal 3 tons).

$a =$ Constant number (for red deal 781).

Therefore, for a pillar 8 in. by 8 in. by 12 ft.—

$$W = \frac{781 \times 4,096}{144} = 222 \text{ tons.}$$

$$BW = \frac{222 \times 192}{222 + 144} = 116 \text{ tons, or } 11 \cdot 6 \text{ safe load.}$$

(2) To obtain the diameter of a pillar when the weight and length are known from the formula $W = \frac{a \times d^4}{l^2}$ take d out of the equation, and invert the values—

$$d = \sqrt[4]{\frac{W \times l^2}{a}}$$

Since the strength of a beam uniformly loaded, with the ends fixed, is to a beam similarly loaded, but with the ends loose in the proportion as 3 is to 2, the formula $W = \frac{WL}{12d}$ is correct.—**R. J. ANGEL.**

[10886].—**Breaking Weight.**—By the formula given—

$$BW = 781 \frac{D^4}{L^2} = 781 \times \frac{8^4}{12^2}$$

= 222.15 tons, which is far too high a figure. A better formula is that of Shaler Smith, where—

$$W = \frac{5000}{1 + \left(\frac{8}{B} \times .004\right)}$$

$W =$ breaking load in pounds per square inch of area of a post of yellow or white pine.

$B =$ length in inches squared.

$B =$ breadth in inches squared.

By this formula the 8 in. square post should bear—

$$W = \frac{5000}{1 + 2.736 \times .004} = \frac{5000}{64}$$

= 2177 lb. per square inch.

As the sectional area of post is $8 \times 8 = 64$, the breaking weight will be—

$$\frac{2177 \text{ lb.} \times 64}{2240} = 62.2 \text{ tons.}$$

If the post were round, calculate as for a square post, and divide by 1.7 for breaking weight. To reverse this formula, having given length of post and breaking weight,

use a method of trial and error, assuming a section and calculating what it will bear until the right one is found. A factor of safety of 10 should be used for wooden struts. For the rolled beam the formula $\frac{WL^2}{12}$ gives the greatest

bending moment (which is at the supports) for a beam fixed at both ends and uniformly loaded. This must be equated to the moment of resistance which approximately = area of flange \times limiting stress allowable \times full depth of beam. Take the units the same in both equations, pounds or tons, inches or feet.—**SIGN SENG.**

[10887].—**Cubing Buildings for Approximate Cost.**—The following is the method I adopt, and one usually observed. Take the main block of buildings which is roofed to a certain height and has about the same character of design, and measure length and breadth, multiplying them together as a superficial out to out of walls, though neglecting small projections like bay windows or small projecting parts. Then for height take to bottom of footings to half-way up the roof, irrespective of the pitch. If there are lower buildings or offices of plainer workmanship attached, their contents should be separately taken at a lower price per foot cube and added to the cost of the main block. Some architects take from bottom of footings to plate level, thinking the space below ground equivalent to the roof.—**G. H. G.**

[10887].—**Cubing Buildings.**—The proper method of abstracting the cubical contents of a building is to measure from the bottom of the footings to the top of the plinth, and multiply by the length and breadth at that level. Then take another calculation for the upper portion, measuring from the top of plinth to a point half-way up from the wall-plate to the ridge of the roof by the length and breadth at that level. All horizontal measurements are taken from the outside surfaces of the wall. Projections such as porches, bays, oriels, &c., are cubed separately and contents added to the previous results. Flat roofs are measured to the top of the parapet walls, except in cases where they are exceptionally high. Then a reduction per cubic foot in the cost will balance it.—**R. J. ANGEL, Birkenhead.**

[10888].—**House Drainage.**—A ventilating-pipe should be brought up from the cesspool above ground, so as to allow the gases as they accumulate to escape, and to relieve the pressure. If the house-drains are disconnected, so much the better, as any foul gas from the cesspool would escape at this point instead of entering the house. By inserting a ventilating-pipe in the cesspool a current of air will be set up between the disconnecting-chamber and the ventilator, and no gas can then accumulate.—**G. W. C.**

[1089].—**Surveyors' Charges.**—It is usual for the surveyor to charge half to the client and half to the builder for measuring up the work; and in this case for both building owner and builder to pay their respective surveyors.—**G. W. S.**

[10891].—**Covered Way.**—Permission to erect a covered way over a private yard connecting two buildings is required.—**G. W. S.**

CHIPS.

The funeral of Mr. John Scrivener, builder, of Warley-road, Brentwood, who died at the age of 58, took place in Warley cemetery on Friday.

A singular mishap occurred in St. Paul's Cathedral at noon on Tuesday. The man who winds up the clock had just completed his work when one of the weights, which scales about 800 lb., fell through the timber supports of the clock, and crashed through the tower staircase. Happily no one was hurt.

Mr. Joseph Broadberry, who has just been appointed a justice of the peace for Lincoln, is foreman over one of the workshops at Messrs. Clayton and Shuttleworth's Stamp-end Works, and is the first working-man magistrate who has sat on the bench in that city.

At Coseley parish church on Thursday in last week, the bells which have been re-cast by Messrs. Mears and Stainbank, of London, were rededicated.

Mr. T. J. Moss Flower, C.E., Cert. Mem. San. Inst., has been appointed surveyor and sanitary inspector, subject to the approval of the Local Government Board, at Portishead, near Bristol. There were numerous applications for the post. Mr. W. E. Jones, F.R.I.B.A., and Mr. Moss Flower were left in the final selection. The latter gentleman was recommended by the general purposes committee, and the appointment was confirmed by the board. Mr. Moss Flower still continues his private practice at Carlton Chambers, Bristol.

The Bishop, Dean, and Chapter of Ripon are taking steps to erect a reredos in Ripon Cathedral in harmony with the style of the choir.

The first of a series of lectures on sanitary science, which are being promoted by the Shipley Local Board, was delivered by Mr. W. Spinks, A.M.I.C.E., in the Co-operative Hall, Shipley, Yorks, on Tuesday week. The lecturer showed the dangers to health that arose from defective drainage.

The old bridge across the river Clyde, at Rutherglen, Glasgow, known as Rutherglen Bridge, is about to be taken down and replaced by a handsome granite bridge of three spans, of 90 ft., 100 ft., and 90 ft. respectively, and having a width of 60 ft. between the parapets. The new bridge has been designed by Messrs. Crouch and Hogg, C.E., Glasgow, and the contract has been let to Messrs. Morrison and Mason, Limited, the price being nearly £63,000.

Legal.

WHAT IS A "SKY SIGN"?

NO sooner do we get a statute regulating the use and abuse of sky signs, than cases arise in which the Courts are asked to say what is a "sky sign" in accordance with the Act obtained by the County Council of London, the Sky Signs Act, 1891. The definition given in that statute covers any representation in the nature of an advertisement, put up wholly or in part over any house or building, and which is visible against the sky from the street; and it is provided that it shall be unlawful to retain any sky sign previously existing, except under license from the County Council. Two cases have lately been taken to the High Court, in which this statute had to be construed. The first arose about a windmill put up by Carwardine and Co. (*Times*, November 2) upon and over their house in the City-road. The contention of the owners was that this structure did not come within the Act at all, as it was primarily intended and used to grind meal, generate electricity, and hoist sacks. But it appeared that the name "Carwardine," composed of large letters, was placed upon the apparatus, and painted on the rudder or tail. The Court held that in its then state it came within the Act as being partly used for advertising purposes, being put up over the building, and visible against the sky; but they intimated that if the name of the owner, &c., were painted out the windmill itself would no longer be a "sky sign," and so it could remain.

In this case the Court said that what the Act meant to deal with was advertisements attached to any support over a house, or, in other words, put up over buildings in such a way as to have no other background than the sky. In the later case of Madame Tussaud's Exhibition (*Times*, November 11), this rule was applied with the result of beating the County Council. There the words "Madame Tussaud's," made of large wooden letters 3 ft. long, were fixed upon an open trellis-work of iron 35 ft. long, which was supported by iron posts, and braced back to the dome which surmounts the building. The sky could be seen through the letters on each side of the pavement, and the magistrates convicted on the ground that this was a sky sign put up before the Act was passed, and for which the license of the County Council should have been obtained. After much argument the Divisional Court held that the magistrate was wrong, and they set aside the conviction. The main ground of their judgment was that, though the trellis-work upon which the letters were placed was attached to the house, it was not "over" it. They held that the important words of the definition clause are: "Supported on or attached to any framework or other support wholly or in part over any house, building, or structure." But the Judges cautiously added that of course every case of this kind must depend upon its own facts and circumstances. **FRED. WETHERFIELD, Solicitor.**

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

X. Y. Z.—STABLES.—WALL.—I should say that the wall belonged to A upon the facts stated, and so that he could build upon it. But the point may be affected by the deeds of the property and the sale of adjoining premises to B. The wall would seem to have become a party-wall by being "used" as such.

G. T.—CHURCH.—ALTERATIONS.—Probably the rector would be legally entitled to order the alterations stated, especially if done with the consent of the churchwardens, who ought to be consulted upon such extensive work. Strictly speaking, structural changes cannot be properly made without faculties from the bishop for that purpose.

LEGAL INTELLIGENCE.

AN ARCHITECT'S CLAIM FOR FEES.—In the case of Swash v. Remy and Gilmore, heard at the last sitting of Newport County Court, and briefly noticed in our last issue, p. 725, we have received a fuller report out from a local newspaper, from which we gather that among the witnesses called by the plaintiff were Mr. G. Thomas, M.S.A., F.S.I., of the firm of Seward and Thomas, of Cardiff, who considered Mr. Swash had acted in a reasonable and proper manner in giving a certificate of final completion; Mr. Pickwell, architect and engineer, in whose opinion Mr. Swash had not been guilty of any professional negligence in passing these

houses; and Mr. J. D. Whittaker, surveyor, also gave evidence as to his belief that the houses were erected in accordance with the plans and specifications, and that Mr. Swash was not guilty of professional negligence. Other witnesses for plaintiff were Mr. Henry Carr and Mr. Richards, builders; and Mr. John Linton, president of the Builders' Association.

IN RE F. T. PITWOOD.—At the Stonehouse Bankruptcy Court, on Nov. 16, a solicitor applied for the discharge of Frank T. Pitwood, of Plympton St. Mary, builder. He said that the debtor started as a working mason and jobbing builder. In 1889 he commenced building two houses at Plympton, on which he expended £1,900, of which sum he borrowed £1,630. The Official Receiver said the total liabilities amounted to £2,627, which included £300 outside the mortgages. A dividend of 2s. 3d. in the pound had been paid on £271. Debtor continued trading for sixteen months after he knew the property would not realise the money advanced on mortgage. The whole furniture had been claimed by the debtor's wife, a laundress. The debtor was able to live now in far more comfortable circumstances than his creditors, and they felt that he had means somewhere which they could not trace. Counsel for creditors also opposed the application, and asked that debtor should not be granted his discharge until he had paid his creditors a composition of 10s. in the pound. His Honour, Judge Edge, made an order on the debtor to pay 5s. in the pound, or his discharge would be suspended for three years.

WHO IS THE BUILDING OWNER OF A CLUB?—**WINBURN V. NORRIS.**—The plaintiff, Mr. William Winburn, a builder, of Croydon, sued Mr. Arthur James Norris, of The Waldrons, Croydon, in the Queen's Bench Division, on Tuesday, to recover £230, the balance of a building account. The building operations were executed in the year 1888, at the South Croydon Conservative Working Men's Club, the premises of an old brewery being converted into a club-house. It was said, on behalf of the plaintiff, that the defendant, who was the treasurer of the club, was also the owner of these premises, and that he gave all the orders. The defence was a denial of personal liability by the defendant, and an allegation that the works were executed upon the credit of the club, of the committee of which plaintiff was himself a member. The defendant, it was said, merely found the money to acquire the premises for the sake of the club. During the plaintiff's cross-examination as to the minutes of the club, &c., the jury stopped the case, as it appeared from his own books that he merely regarded the defendant as the treasurer of the club, and verdict and judgment were entered for the defendant.

WATER SUPPLY AND SANITARY MATTERS.

RIPON.—Mr. Theo. S. MacCallum, A.M.Inst.C.E., Manchester, has made for the Ripon Corporation a preliminary report on the drainage and sewage disposal of the city. The object is to purify the sewage before it enters the river Ure, in order to comply with the requirements of the Local Government Board and of the County Council. Intercepting sewers are to be constructed, and the scheme will form a basis of further extensions. The works are intended to provide for a population of 10,000.

SHEFFIELD.—The Sheffield Corporation, like many others, has for many years past been troubled as to the disposal of its nightsoil. The privy system, with its usual accompaniments, and some special to the locality, flourishes in full vigour. Probably 50,000 houses have privies, and nearly 45,000 of these use them in common, four, six, eight, or more houses joining at two, three, or four closets. Some considerable time ago a committee reported in favour of the adoption of a system of water carriage, and the council towards the latter end of 1890 instructed its health committee to consider and report upon the means to be devised to carry out such a system for the town, more particularly with reference to the poorer classes of property in densely populated districts. The committee deputed a sub-committee to make the necessary inquiries, and to report. The sub-committee, after a full consideration of various forms of apparatus and methods of applying the water carriage system cheaply, yet efficiently, came to the conclusion that the only practical scheme for successfully carrying out the system in Sheffield must be one based upon the principle of the trough closet. Having decided that closets should be adopted, which, although separated from each other so as to insure perfect privacy, were yet independent of the occupier so far as their cleanliness was concerned, and were destitute of any apparatus that could be broken (all of which advantages are offered by trough closets), the question came to be, whether in such trough closets a reliable and suitable kind of water closet had been found, and if so, which of the many trough closets offered to the public by various firms ought to be recommended for adoption by the corporation. Leading firms were com-

municated with, and asked to place apparatus at the disposal of the corporation for testing purposes, and several firms complied with this request. Mr. G. Alsing, A.M.I.C.E., constructor of sewage works to the Bradford and Sheffield Corporations, and now engaged on a similar work for Glasgow, was, as engineering adviser, conjoined with the medical officer of health to carry out the trials. These gentlemen, in due course, made their report, which has recently been presented to the council. The report sets forth that the observations were instituted in order to find out, if possible, which was the best and most reliable automatic flushing trough closet under all conditions, and that the inquiry embraced three branches: (1) The supply of water to the flush tanks; (2) the flush tank itself; (3) the trough. The reporters state that under the first head there was at the outset considerable difficulty in getting a continuous feed at a slow rate through such taps as were then at the disposal of the committee, but that after communication with the various firms who had supplied apparatus, two were obtained which, under conditions which were devised, could, in the opinion of the reporters, "confidently be relied on, under ordinary circumstances, to run continuously and with little variation for a lengthened period without supervision." Under the second head the report states that in testing the flush tanks, certain special points had to be kept in view: (1) Absolute certainty of automatic action; (2) liability to run to waste without a flush taking place; (3) simplicity and stability of structure; (4) possibility of their being disabled willfully or passively by dirt or constant use. After detailing the behaviour of the various forms of apparatus, and pointing out the danger of all air-holes and small pipes in connection with flush tanks, which, if stopped by what the report calls "the omnipresent dirt," prevented the tanks from acting, "whether supplied with full pressure directly from the main or with only a small feed at low pressure. Instead of now flushing automatically, they simply ran to waste and refused to siphon," the reporters came to the following conclusion:—"From these experiments it will be seen that the only cistern which came absolutely scathless out of the several tests to which they were subjected was that of the Water Carriage Engineering Company, which never failed to flush under any conditions, and which, moreover, is from its construction extremely unlikely to get out of order, or admit of its being easily tampered with. We are, therefore, of opinion that of all the cisterns which we have subjected to observation, this one is the most reliable in every way, and that, under all ordinary conditions it can be depended on to act automatically and with regularity." Under the third head three points were judged to be the essentials of a satisfactory trough, viz.: (1) General suitability for forming separate closets; (2) stability and simplicity of structure; (3) cleanliness. The reporters state: "The form of trough which undoubtedly seems to us to be most favourable to a good flush is a triangular one, as exemplified in the two examples of the Water Carriage Engineering Company. By adopting this form, a minimum amount of water reaches a maximum amount of surface; or, in other words, with the same volume of water as in the other forms, less surface liable to be soiled remains unaffected by the flush." The council unanimously adopted the report, and has instructed the committee to draw up conditions under which the conversion of the present privies can be vigorously proceeded with.

CHIPS.

At a general meeting of the Institute of Painters in Oil Colours, held on Wednesday evening, Messrs. Frank Brangwyn, Alexander Mann, and J. A. Lomax were elected members.

A member of a vestry in Westminster, named William Smith, was prosecuted by his vestry, at the local police-court, on Wednesday, for delaying to carry out necessary sanitary works upon houses belonging to him in Marham-street. Ultimately further time was allowed for the works to be completed. Upon other summonses against the same defendant, orders were made for the repairs to be executed forthwith.

The Crediton improvement commissioners discussed, on Monday, a claim from the surveyor for fifteen guineas for extra work. A proposal to pay him this was lost, as was also an amendment to pay him ten guineas for it. The surveyor intimated that he should have to take other proceedings.

A lych-gate of oak, with Broseley tiles, and new wall capped by iron railings, have just been erected at Merton Churchyard, Devon. The work was executed by Mr. H. Read, of Exeter.

A temporary smallpox hospital has been built for the Otley local board. The building is of wood, and covers an area of 60ft. by 70ft. Mr. Trow, surveyor to the Otley local board, prepared the plans, and the work was carried out by Mr. Patrick, joiner, Otley.

Our Office Table.

THE London County Council will apply to Parliament in the ensuing session for leave to introduce a Bill "to impose, or provide for, or authorise the imposition of a new rate or charge on lands and property within the County of London or the owners thereof, the proceeds of which shall be applied in aid of the cost of improvements and works of public utility effected" by the Council. The Bill may also "provide for the manner in which such rate or charge shall be collected in respect of vacant lands or unoccupied or public buildings." Application will also be made to Parliament by the Council for leave to introduce Bills under the following titles: "London Improvements," "London Open Spaces," "London Streets (Removal of Gates, Bars, &c.)," and "London County Council (General Powers)."

A PUBLIC improvement has just been completed at Manchester by removing the heavy railings on the north and west sides of St. Ann's Church, thus converting a narrow passage at the west end of the church into a broad thoroughfare, and increasing the width of another street. The works have been carried out by the Manchester Corporation, who will pay the trustees a rent of £100 in perpetuity. St. Ann's Church is, with the exception of the cathedral, the oldest one in Manchester, having been built from Wren's plans, and consecrated by Sir William Dawes, Bishop of Chester, on July 12, 1712. It was partially restored in 1890, at a cost of £1,000, but more important alterations have yet to be effected, as soon as the funds, amounting to about £1,500, can be raised. These further works include new side staircases to the gallery; the opening out of the west entrance, making it, as originally, the principal entrance to the church; the removal of the organ from the west to the north gallery; and the filling of the windows throughout with new mullioned and transomed frames and glazing. The pews and wainscot panelling and gallery front on the south side of the nave are also to be restored, cleaned, and adapted to modern requirements, to harmonise with those already treated on the north side.

THE directors of the Nottingham Trade Protection Society have forwarded to the Lord Chancellor a memorial, calling attention to the state of the law with regard to rights of light. They are convinced that the interests of traders very frequently suffer in the centre of large towns, when, upon requiring to rebuild and modernise their places of business, they find their plans thwarted by reason of rights of light, which rights are frequently exercised in a manner that is not for the good of the community. Very often, as they pertinently remark, a fictitious value is put upon windows and openings which are of small value, and buildings have to be dwarfed and cramped for fear of damages. Moreover, great uncertainty prevails, as the owner rebuilding has often no means of ascertaining what will satisfy his neighbour, should he refuse to declare himself, until an application is made to restrain, or an action is brought for compensation, whereupon professional witnesses on both sides are forthcoming to seek to minimise or increase the value of damage done. In order to prevent this uncertainty, the memorialists suggest that it is desirable a local authority in each town should be constituted, to whom either party might apply, and who should have authority on the spot to examine the old building if standing, or the new one if erected, and who should be authorised to decide the size of the proposed openings, the height of proposed buildings, or otherwise. They conclude by asking Lord Herschell to give attention to the matter with a view to the bringing into Parliament a Bill, so as to secure the objects indicated.

THE Stafford board of guardians discussed at their last meeting the charges made by Mr. Wormal, architect, for preparing two sets of plans for the new workhouse infirmary now in course of erection under his superintendence, Mr. Espley, of Stafford, having taken the contract at £3,900. Mr. Wormal's bills amounted to £310, being £115 for the plans rejected by the Local Government Board, and which included besides the infirmary a chapel and lodge, and £195, being 5 per cent. on the works actually in progress. Several members expressed an opinion that £115 was a large sum to pay "for nothing."

—i.e., for an architect's time and labour for plans not passed by the higher authority, but the clerk said no special arrangement was made with the architect when instructions were given him. Ultimately a resolution was passed offering Mr. Wormal £250 in settlement of all charges, in effect equivalent to docking 50 per cent. from his bill for the rejected plans.

Mr. J. Lewis, of 5, Great Winchester-street, London, E.C., has patented an invention relating to the couplings which in lightning conductors serve to connect the top rod to the copper tape, and it has for its object to provide a device by means of which bad contact, which is liable with couplings now in use owing to the two parts which constitute the coupling not fitting properly and to negligence on the part of the workman or otherwise, may be avoided. The coupling, instead of being made in two pieces, as heretofore, is made in a single piece (approximately of link or stirrup form), and having sockets at its upper and lower parts, the former being cylindrical and screw-threaded for attachment of the top rod, while the latter is of flattened and of dovetail or wedge shape for retaining the tape, which is secured to the coupling by passing it through the socket, and out laterally, and then doubling the end of the tape on itself, so that when the tape is drawn back its end is jammed in the socket, and it is effectually prevented from becoming detached; the strain on the tape assists materially in maintaining good contact. The idea is a good one, and should be generally adopted.

The American Institute of Architects at the twenty-sixth annual convention, recently held at Chicago, under the presidency of Mr. E. H. Kendall, decided to formally petition the U.S. Treasury Department that the name of William Frazier, which is now on the Treasury in Wall-street, New York, as an architect, be expunged, and that the name of William Ross, who was the real architect, be substituted, as it has been discovered that Frazier was only superintendent, while Ross had designed the building. It was also recommended that every architect should cut his name on his own building—a plan that has been adopted, it will be recollected, by a few architects practising in the City of London by no means in the first rank of our professional men.

The Union Tare Indicator Co., of Adelaide-street, Halifax, draw our attention to their patent tare indicator for indicating the tare weights of animals and vehicles. Should a change of animal take place, the indicated tare weight can be altered by simply removing the lock and bar from the indicator, and turning the wheel or wheels in any direction so as to produce the figures required. After this operation, which only occupies a few minutes, the lock and bar are replaced in their original positions.

The Frascati Restaurant, 32, Oxford-street, W., has, under new management, recently reorganised its resources—which probably surpass those of nine out of ten similar establishments in London—to good purpose. The restaurant and Winter Garden is situated on the northern side of Oxford-street about fifty yards west of Tottenham Court-road, having a frontage of 110ft., an elevation of five stories, three entrances in Oxford-street and one in Hanway-street, to which the buildings extend in the rear. The front building contains the buffet, restaurant, ladies' toilet rooms, grand banqueting hall, and ballroom (capable of dining 150 guests), Masonic temple, reception and billiard rooms, the latter having five English and three French tables. The central buildings are occupied by the Winter Garden (in which is placed the orchestra and reading-room), illuminated by nearly 1,000 incandescent lamps, and is approached from all entrances. The café restaurant occupies the ground floor, while the balcony is reserved for table d'hôte and French dinners. In addition to the above, there are various ante-rooms, gentlemen's lavatories, offices, stores, wine-cellars, kitchens, and an electrical installation comprising over 2,000 lights. A capital programme of music is rendered nightly in the Winter Garden from 6 till 10.

At Tuesday's meeting of the Coventry Corporation the City Surveyor reported that during the year plans had been sanctioned for the erection of 132 dwelling-houses, being a decrease of no less than 432 on the previous year, and 36 on the year 1890.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Society of Arts. "The Generation of Light from Coal Gas," Cantor Lecture No. II., by Prof. Vivian Lewes. 8 p.m.
Society of Engineers. "The Shortlands and Nunhead Railway," by A. G. Drury. 7.30 p.m.
TUESDAY.—Society of Architects. "Levelling and Counting as Applied to Architecture and Landscape Gardening," by G. W. Usill, R.M.Inst.C.E. 8 p.m.
Institution of Civil Engineers. "The Manufacture of Small Arms," by J. Rigby, of Enfield. 8 p.m.
WEDNESDAY.—Society of Arts. "The Copper Resources of the United States," by Jas. Douglas. 8 p.m.
FRIDAY.—Architectural Association. "Daylight in the Dwelling-house," by John Brett, A.R.A. 7.30 p.m.

The Architectural Association.—December 2. The Third Ordinary General Meeting at 7.30 p.m. Paper by John Brett, Esq., A.R.A., on "Daylight in the Dwelling-house."
ERNEST S. GALE
F. T. W. GOLDSMITH } Hon. Secs.

Trade News.

WAGES MOVEMENTS.

THE WAR OFFICE AND WAGES IN THE BUILDING TRADES.—A deputation of workmen and trade-unionists, consisting of Mr. G. Dew (General Secretary of London Building Trades Committee and Amalgamated Carpenters and Joiners), Mr. J. Rogers (Amalgamated Painters and Decorators), Mr. P. Weighill (Stonemasons), Mr. W. Gibbs (Operative Bricklayers' Society), Mr. W. Brooks (Lathrenders), and Mr. J. Verdon (Secretary London Building Trades Federation), on Saturday attended at the War Office respecting the alteration of rules which has taken place in the building trades. The deputation was received by the Assistant Secretary. Mr. Dew explained the new arrangements and the minimum rate of wages as agreed to in June last by the Master Builders' Association and the London Building Trades Federation, as representing the workmen, and asked the Government to adopt the same, or put a clause in all contracts compelling all contractors to pay the recognised trade-union rate of wages, or a clause whereby the current minimum rate of wages would be paid. In answer to Mr. Brooks, the Assistant Secretary said that, in consequence of the information he had supplied respecting the lathrenders, the War Office sent an inspector to Aldershot to make inquiries respecting the using of foreign-made laths. That official confirmed Mr. Brooks's complaint, and the War Office had now decided that only English hand-made laths were in future to be used in Government work. The Assistant Secretary said the matters brought forward should be carefully considered. The War Office was always willing to receive deputations from practical workmen with respect to the work being carried out by the Government.

CROYDON.—A strike has occurred in the building trade in this borough through the refusal of the master builders of that district to recognise the London radius as defined by the conference of workmen and the Master Builders' Association in May last, and which came into operation on November 7.

CHIPS.

The Barrow Island School is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

An adjudication in bankruptcy has been made in the case of Joseph Chinchin, of East Cowes, I.W., builder and contractor, and surveyor to the East Cowes local board of health.

In the case of John Thomas Farley, of Truro, builder, the discharge from bankruptcy has been suspended by the Court for four years, ending October 6, 1896.

An inquest was opened on Wednesday week at Cullyhanna, near Crossmaglen, Newry, on a stone-mason named Patrick Bennett, aged 50, who was accidentally killed whilst working at Cullyhanna Catholic Church, now in process of erection. The deceased and a labourer named James Robb were removing the centres which supported the chancel arch during construction, when the arch collapsed. Robb escaped with a shock, but Bennett was killed on the spot. Father Kerley, P.P., and Mr. Wynne Dundalk, builder of the church, were present at the inquiry. The inquest was adjourned for the attendance of the architect of the church, Mr. Haigue, of Dublin.

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TENDERS.

* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

BANGOR.—For the erection at Bangor of the North Wales Training College, the site being given by Lord Penrhyn, and the designs prepared by Mr. R. Grierson, Bangor.

Williams, E., Bangor	£10,811 0 0
Williams, R. and J., Bangor	9,187 0 0
Morris, O., Carnarvon	8,987 0 0
Griffith, J., Criccieth	8,864 0 0
Parnell and Son, Rugby	8,417 0 0

* Accepted.

BEVERLEY.—For heating the extension of the male infirmary of the East Riding County Lunatic Asylum. Mr. Alfred Beaumont, C.E., county surveyor:—

Baird, Thompson, and Co., London and Glasgow	£494 0 0
Jeakes and Co., London	427 17 0
Perkins and Son, London	345 0 0
Haden and Sons, Manchester	316 0 0
Wenham and Walters, Croydon	268 7 2
Ellis, J. C. and J. S., Sheffield	260 0 0
Wood and Co., Bristol	222 0 0
Taylor, Warrens	197 0 0
King, J., Limited, Liverpool	183 10 0
Wright and Son, Hull	179 0 0
Newsum, Wood, Dyson, & Co., Leeds	166 13 10
Pickup, J. H., and Co.	165 0 0
Green, T., and Sons, Leeds	150 0 0
Watchman and Co., South Shields	143 0 0
Thomlinson-Walker, York	139 5 6
Doughill, A., Leeds	133 13 0
Appleton, E., Hull	130 15 0
King and Co., Hull	125 4 4
Mallinson, J., Hull	120 0 0
Milan, F., Huddersfield	115 0 0
Wells, G. F., Beverley	113 16 0
Taylor, J., Beverley	112 11 9
Witty, G. S. and J., Beverley	100 10 6

* Accepted.

CHURCH STRETTON.—For constructing a new reservoir, for the Water Works Co. Mr. Cobbold, of All Stretton, engineer:—

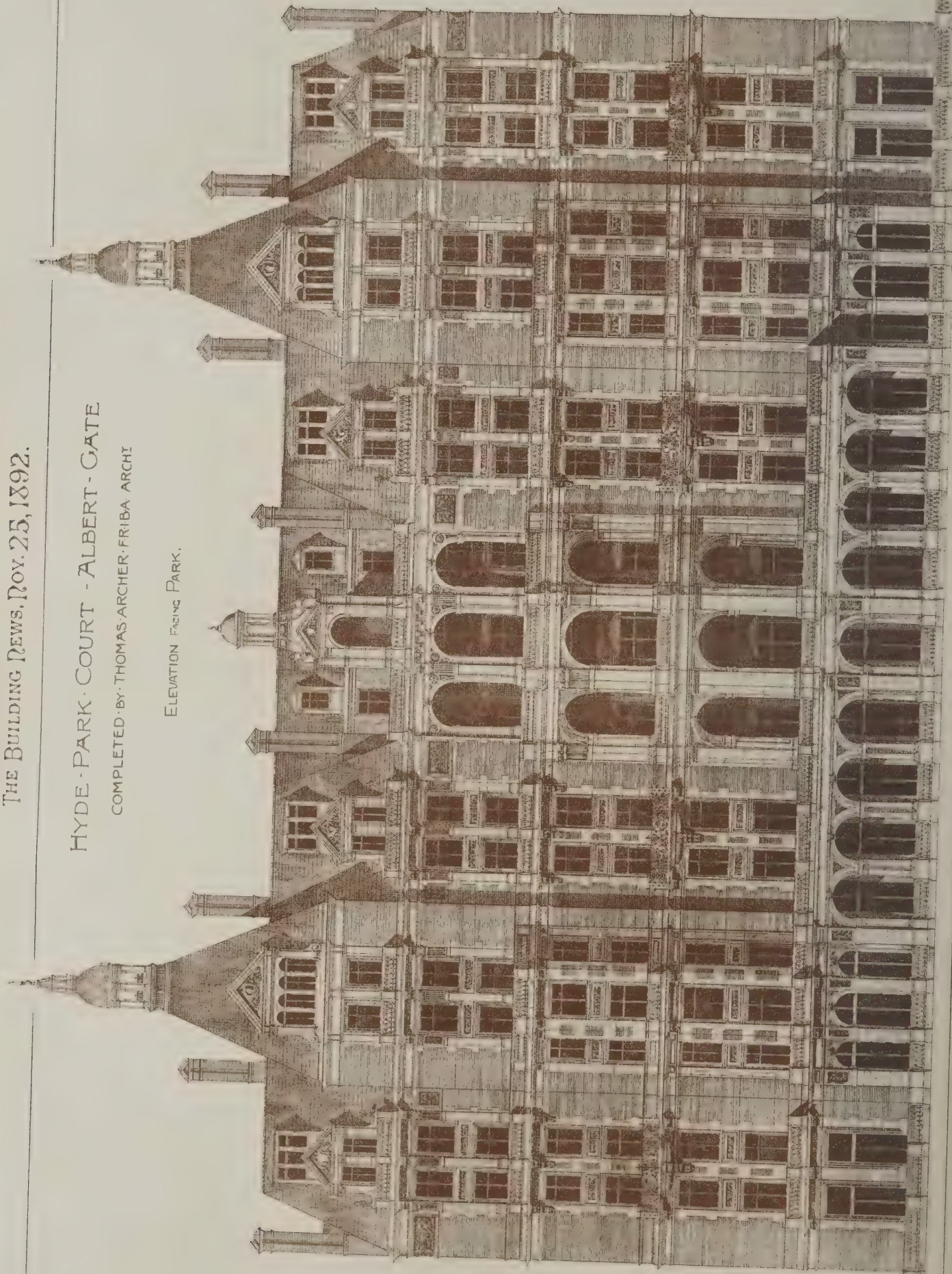
Davies, of Ludlow (accepted) £400 0 0

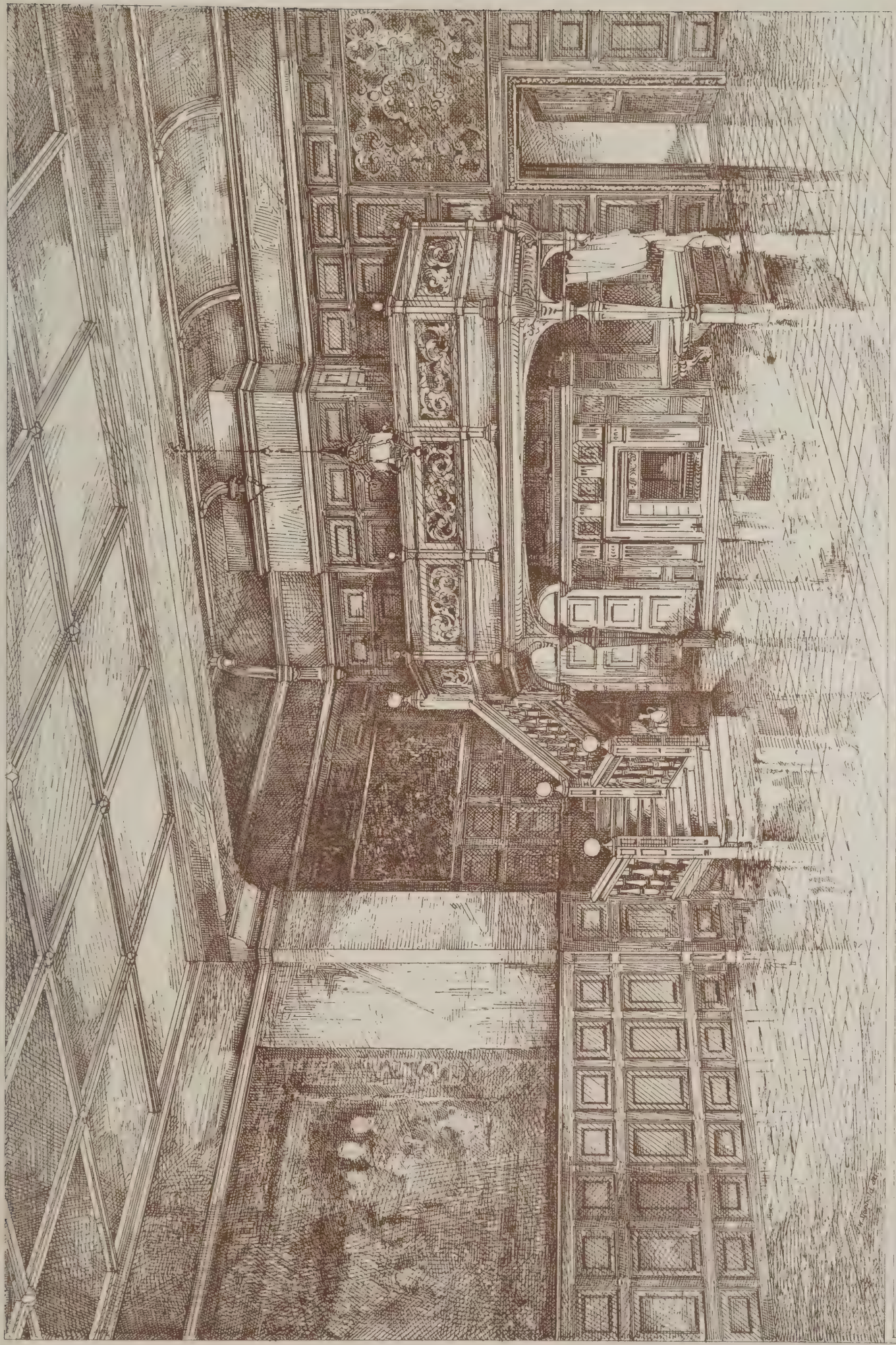
THE BUILDING NEWS, NOV. 25, 1892.

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DRYBURGH ABBEY SIR WALTER SCOTT'S TOMB

ews. Nov. 25, 1892.



"PHOTO-TINT", by James Akerman, 6, Queen Square, London, W.C.

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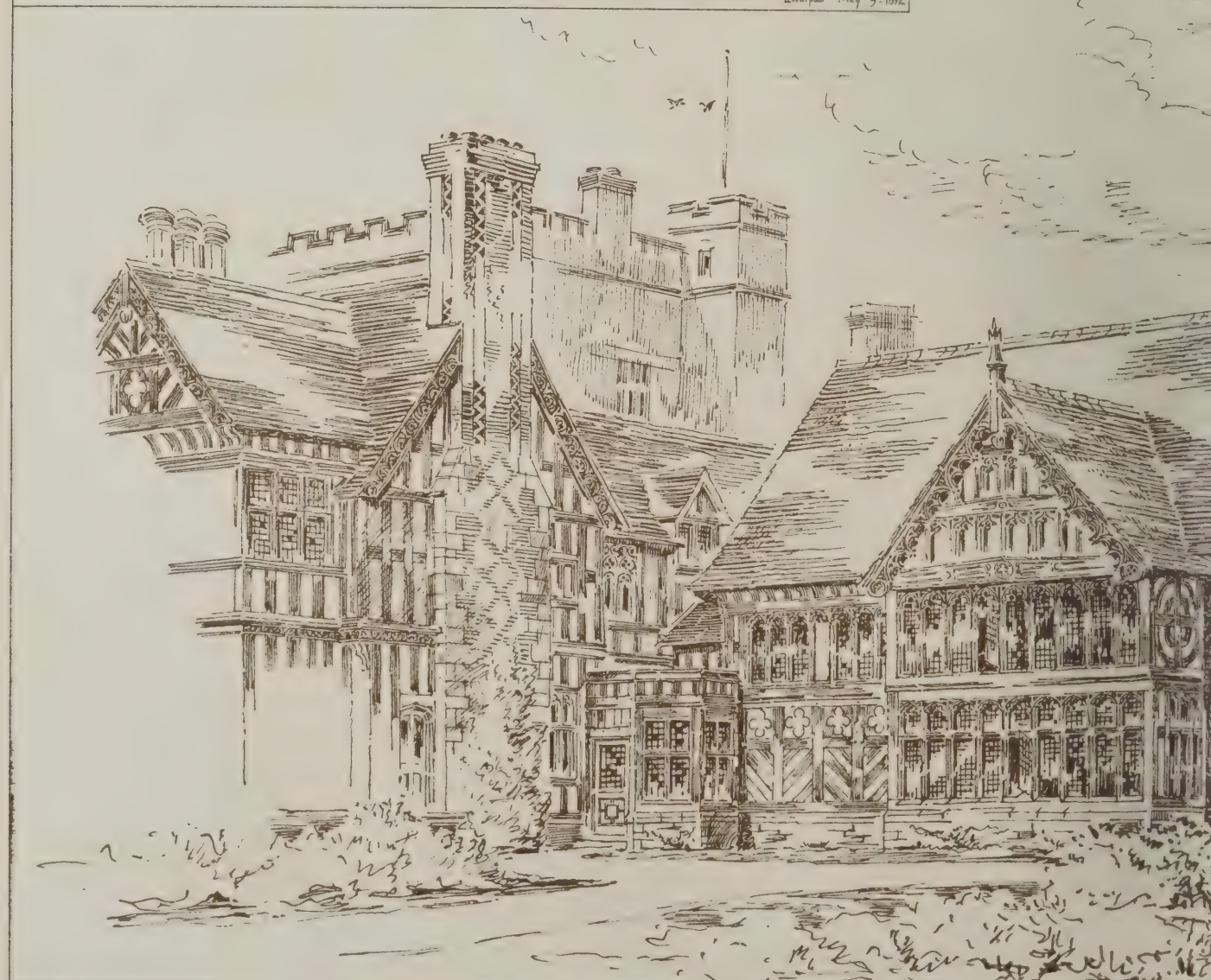
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Sketch s



: WIGHTWICK MANOR : Sketch of the Interior of Great Parlor

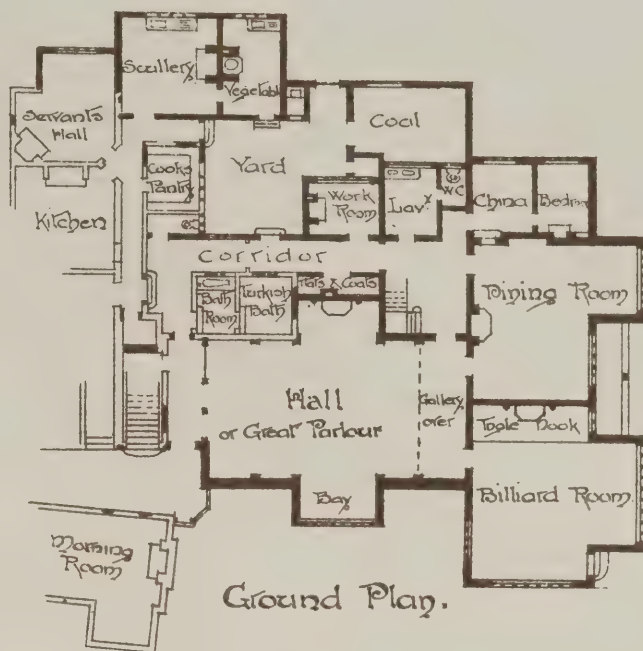
Grayson & Ould Architects
Liverpool May 9th 1892



TWICK MANOR :

wing proposed addition :

Grayson & Ould Archts:



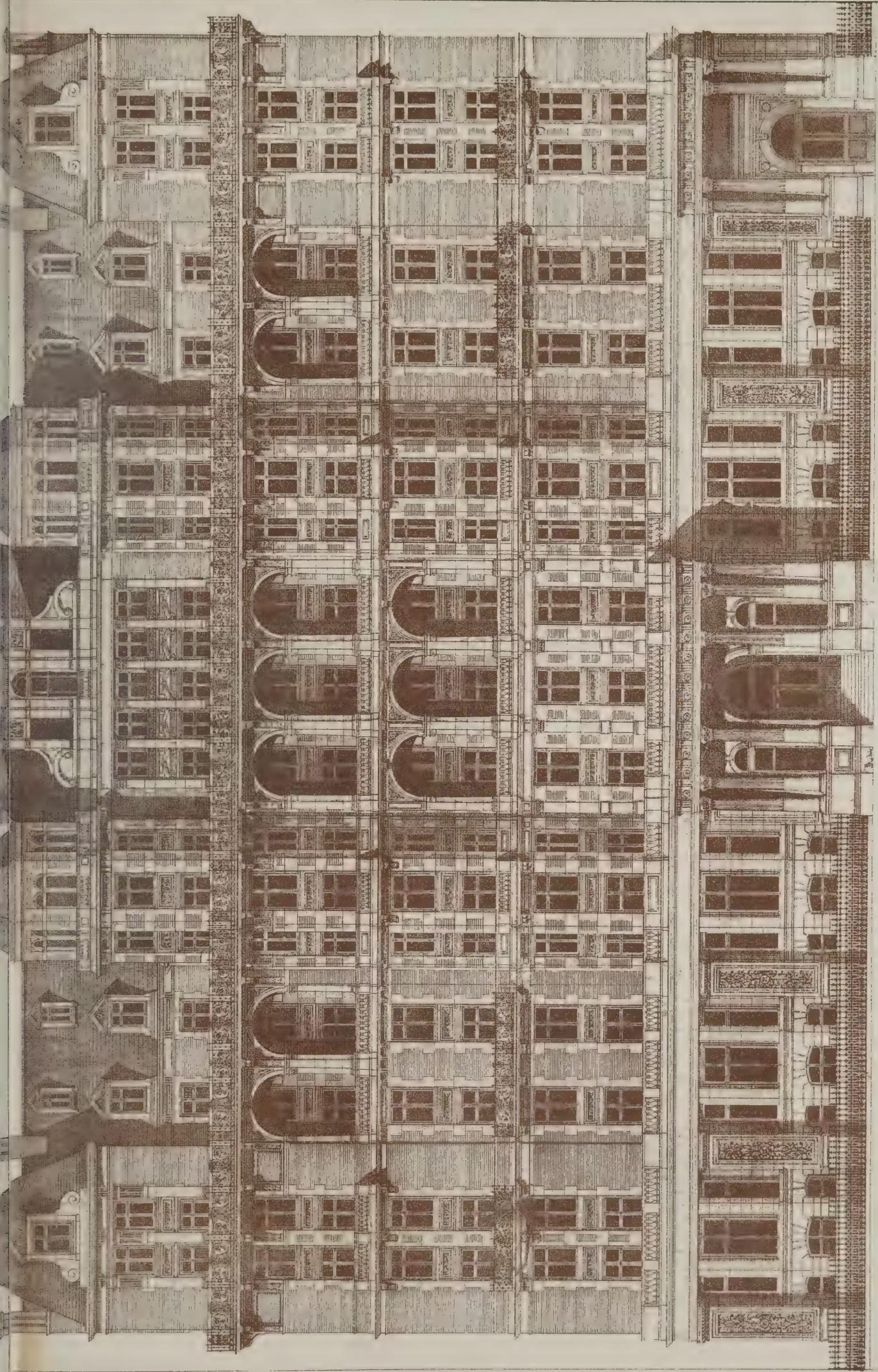


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HYDE PARK COURT - ALBERT GATE

COMPLETED BY THOMAS ARCHER FRIBA ARCHT

PHOTO-TYPE by James Auerman 3 Upper Square London W

THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1978.

FRIDAY, DECEMBER 2, 1892.

THE NEW WORKS DEPARTMENT OF THE LONDON COUNTY COUNCIL.

LONDON has been given, in the announcement, referred to by us in our issue of last week, of the new Works Department by the London County Council, one of the most important pieces of building news to digest that has come before the public for many years.

After deciding to become their own builders, it was, as we have already pointed out, the one and only course open in order to make the scheme at all workable. Experience, and experience alone, will enable the public to decide whether or not the principle of turning a municipal body into an employer of labour on such a large scale as the carrying out of the works of the Council will compel is a wise one. The Press generally have considered the question of such vast importance to the ratepayers of London, that they have devoted much space in arraying, according to the various shades of politics they represent, the advantages and disadvantages that will accrue from the adoption of the resolution of the General Purposes Committee by the Council. We cannot sympathise in any way with mixing up politics and questions affecting the local government of our Metropolis. If the creation of the Works Department is but a bait to catch the labour vote, as has been suggested, we most strongly deprecate the action of the Council. If, however, a genuine desire to benefit the ratepayers as a whole, and not as a class, influenced the Council, then we must heartily wish the venture every success, especially as we feel this motive was uppermost in the minds of the majority of the members.

It is well, however, to weigh this question quietly, with an impartial mind, and to review the opinions that have been expressed by both sides, before arriving at any judgment of the wisdom of the great changes it involves, changes which we must venture to think the Council themselves have not yet foreseen. Little time was allowed to elapse from the day when it was resolved to build the artisans' dwellings at Blackwall without a contractor, and the day when the General Purposes Committee presented their report with the whole scheme, evidently in accordance with their views, cut and dry, for carrying out the Council's work in the future; but it does not require a very experienced eye to find out that the arrangements proposed are far from complete. Take, for instance, the organisation of the staff: we are not alone in considering that the salary of £700 a year for the "manager of works and stores" is deplorably insufficient, and will not enable the Council to secure a man of sufficient *locus standi* to fill the post to the credit of the Council and the benefit of the ratepayers. Whatever the members themselves may think, it is this official who will make, or mar, the whole scheme. Doubtless they flatter themselves that the new "Works and Stores Committee" will be the hand that will hold the whip and the reins; but how, we ask, can a body of men who have had no experience whatever in the building trade, who have but partial leisure and their own business to carry on—how can these men, with no technical knowledge, and varying opinions, and perhaps fads, be expected to conduct a huge contractor's business with the same exactness, the same completeness, and with the same advantages, as a man who has been trained from boyhood to

every branch of the vastly complicated calling of a builder? The London County Council will fail most egregiously in this undertaking if they do not place the chief officer of the new department in exactly the same relation with their architects and engineers as they would an outside contractor.

The Council, it must be remembered, not only employ their own architect and engineer, but other professional advisers are from time to time called in. For example, Sir Benjamin Baker was consulted in reference to the Blackwall Tunnel; the Municipal Lodging-house, in Drury-lane, is in the hands of architects not on the staff of the Council; and Claybury Asylum is being carried out by Mr. George T. Hine. In the future, not only the architects and engineers on the staff of the Council, but also architects and engineers in private practice, must come in contact with this new official. Supposing, inadvertently or otherwise, bad or inferior material were introduced into a building, who is to condemn this material? Is the architect or engineer, whether on the staff or not, to report against a brother officer or against his masters, the committee? Is the architect to lose all control over this substitute for a contractor, and is he or the engineer only to "prepare plans," and not be responsible in any way for the carrying of them out? If so, the scheme will not be a success; the architect and engineer should certainly retain the same power of supervising the work as under any contract with a builder.

Again, the success of the scheme greatly depends upon what kind of control the committee maintain over their paid officers. It will be impossible for a body, constituted as this committee must be, to supervise every detail; but unless they do, the whole responsibility must rest with the staff. A contemporary argues that a committee of a changing elective body, composed of persons who, in regard to such business as that of building or draining works, must necessarily be amateurs, is not likely to show efficiency in the control of large, costly, and complicated undertakings. If it leaves everything to its chief officer and its departmental staff, it will create a "dangerously powerful bureaucracy which may not always be incorrupt, and which is almost certain to become obstructive." If it meddles with details, it will reduce the departmental officials to abject insignificance, and will meet with the usual success of amateurs. We are also reminded that the downfall of the Metropolitan Board of Works was caused, not by the corruption of the members of the Board, but by the corruption of its officials, and that there is hardly any line of business where corruption is more easy than in the building trade. "The Council," it has been said, "in its laudable desire for economy, has fixed the rates of payment on a very moderate scale, thus making the temptation all the greater."

Now look for a moment what is required of the chief officer. In return for £700 a year, he shall be responsible under the Works Committee for advising as to the purchase of stores, plant, and material; the execution of all works carried out by the Works Committee on behalf of the Council; the employment and supervision of all officers and workmen in his department or employed on works; the regulation and direction of all store-yards, depots, and workshops belonging to the Council.

We venture to think the Council will meet with the same difficulties they did when they wanted a "chief" for the Parks Department. As they could not get a man who was fit to undertake the work for the money they offered, they did the best thing they could under the circumstances, by raising one of their own officers to the position. But in this case they cannot fill the post from their own ranks; they must go to the outside world,

and doubtless will find hundreds willing to undertake the "job," but whether any of them will be more fit for a "job" than the post must be merely a matter of surmise. The *Times* forbears from conjecturing whether a person endowed with these varied aptitudes is likely to be secured by the Council at the reduced salary of £700, on which the majority insisted, for the committee were gracious enough to suggest £1,000 a year.

It would be impossible to create an office more open to temptation, or, on the other hand, more open to false imputations, than this one of the Manager of Works and Stores. The Council should, therefore, offer a "fair wage," and not begin their new venture by brain-sweating, which they were warned against some little while ago.

We pity this officer, who, while he is endowed with "a thorough experience of the purchase of material and plant, and the carrying out of large works under some well-known contractor," has to submit to the caprices of a changing body like a committee; for what may please this Council, may not please a Council of three or six years hence. He will have to be a man who, while knowing everything in the building trade, must have no mind of his own.

We strongly urge upon the Council the desirability of obtaining the very best man that can be got, and to pay him well for his work. This, we feel sure, would be an act of wise economy.

Looking deeper into the report, it will be found that it is not the intention of the Council to invest their new officer with unlimited power; on the contrary, the intention is that the power shall be vested in the "Works and Stores Committee," which is to carry into execution all works which the Council resolves to execute without the intervention of a contractor, and control the staff exclusively employed in connection with the works of construction and repair undertaken by them, and is to consider and report to the Council as to the provision of store-yards and workshops necessary for carrying out the works committed to them, and to control all store-yards, workshops, and store depots of the Council, and carry out the regulations of the Council as to store accounts, tenders for stores, and the ordering, issue, and condemnation of stores. In addition to this, the further duties of this committee are that, when the Council shall have resolved to execute any works without the intervention of a contractor, and shall have passed the necessary estimate of the cost of such works, the committee shall have power to contract, on behalf of the Council, for the supply of plant and material, provided that the amount of the contract does not exceed £500, and provided that no contract be entered into by the committee which shall cause the above estimate to be exceeded without the special authority of the Council, and provided also that no contract involving an expenditure of more than £100 shall be entered into except after public advertisement. On the motion of Mr. Westacott it was added that, on the completion of the works referred to the committee, they shall forthwith report to the Council that such works are completed, with particulars of the estimated and actual cost thereof. This wise provision was not, it must be observed, embodied in the General Purposes Committee's recommendation to the Council. Further, separate accounts of liabilities entered into in connection with each work have to be kept, and information of every liability entered into reported upon to the comptroller of the Council. The committee have to undertake the preparation of the schedules and the consideration of the tenders for all goods supplied to the Council, and consider all questions as to contracts for general repairs.

This committee is to consist of 15 members, 12 elected from other committees, one from

remnants of verdure-clad houses. No. 12 represents an "Old Parsonage Farm, Eastbourne," a greystone wall covered by thick clematis foliage, save an old Gothic doorway, at which a woman with child in her arms stands, every detail being rendered with that conscientious fidelity to nature and that instinctive love of the beauties of rural life which always entitle this lady's work to rank as poetical. In this and an "Isle of Wight Cottage" (177) we see more than a close and literal transcript; the work is sympathetic, as if the painter wanted to make us feel the true beauty and charm of the scene. In a stronger and more masculine mode of expression, Robert W. Allan paints his grand "Summer Day in the Highlands" (15), a broad valley through which a silvery rivulet meanders and sparkles, the hillsides wild and treeless, with a grey mountain in the distance. The warm brown and greys of the landscape are forcibly painted. Mr. Allan's other works are a landscape in "Sussex" (79), solidly handled, with much depth of tone; "Rothenburg, Bavaria" (96), vigorous and dark masses of foreground, and reflected light in the water; and a strongly-coloured view of "Kirkwall Harbour" (182). Several pleasing subjects are sent by Tom Lloyd—perhaps a little tame sometimes. His "Sunrise on the Marsh," cattle crossing a bridge (16), cleverly depicts the rising mist over the meadow. "A Breezy Haytime" (39) is a companion subject; we have the river bordering the hayfield, and the figures are pleasingly drawn. Another sunny landscape is 86, a cornfield, and a fourth is "The Close of a Midsummer Day" (167); the rising mist and reflection in river are feelingly painted, but we like his "Tea in the Garden" (21), a smaller study of figures and flowering plants, displaying much delicacy of handling and colour. Thomas M. Rooke is another large contributor. His old houses, Dinan (22), "Knitting Women, Vitre" (41), "Castle of Fourgères" (268), and "Mont St. Michel" (279) are picturesque subjects drawn with the artist's usual sharpness, but lacking repose in some cases. We admire Chas. Gregory's "Caudebec," a street scene, and his springlike "May Morning" (289). One of the best works of Albert Goodwin is "Canterbury," a bird's-eye view of the city; another is his "Oxford from Radcliffe," a delicately and well-drawn view representing the quadrangle and the city under a veil of evening mist. R. Thorne Waite is prolific in landscape, haymaking, cornfields, and marshes are his subjects. Many of these exhibit breadth and artistic grace. "Carting Corn" is a large drawing of cornfield by the sea, a loaded waggon being full of the ripened grain. The horses and labourers are vigorous and full of life. "Romney Marsh" (118) is broad, and the light and colour admirable. Various other sketches are exhibited on the screen, all full of true poetical feeling, and admirable in grouping and colour. Miss Clara Montalba charms by her beautifully soft melodies of pearly greys. Her Swedish sketches (29) and coast scenes (47), "Early Morning" (162), are most captivating colour studies. W. Eyre Walker (74) has a fine study of sycamores and some other tree studies. William Collingwood contributes a splendid mountain peak tipped by rosy light, "Monte Rosa" (52), and other mountain studies of exquisite colour. Walter Crane sends a clever sketch for a decorative subject, "Neptune's Horses" (38).

Mr. Arthur H. Marsh (85) sends by far the best figure subject, "The Messenger," a picture full of pathos, and of masterly drawing. It represents a cottage home by the sea. A young fisherman is knocking at the door, while a number of villagers, women and men, are standing anxiously in front awaiting the sad message which the young fisherman has brought to the hapless

inmates. The expressions of sympathy and expectation are visible in the women's faces, and the figure of an old fisherman keeping back the too-eager and gossiping friends is excellent. This work is given a place in the centre of gallery, and its merits as a composition entitle it to honour. In the corner, E. R. Hughes's "The Poet Gringoire" (64) has also much of the pathetic in the seated figure of the handsome young man who has two children under his cloak. On the other end of gallery is a choice collection of designs of imaginative and Scriptural subjects. The principal design is "Gloria in Excelsis" (249), illustrating that noble ancient hymn of the Church, which is supposed to belong to the first century. The painter represents here in pre-Raphaelite minuteness the vision of the heavenly hosts, including the Saviour, with the Bethlehem shepherds rising from their slumbers below. The figures in the vision are not all obvious, and may be open to criticism, yet there is something grand about the conception from a decorative point of view. "The Impetuous Neighbour" (250) is more representative of Mr. Holman Hunt's genius; his interesting portraits in silver point of "Christ Before Pilate" and "The Hidden Treasure" (245) are valuable examples. The President, Sir John Gilbert, R.A., has only one subject (160), a fine "Study of Trees" in a forest, the trunks being vigorously painted in Sir John's best manner. The study has an oil-like depth of tone. E. Burne Jones, A.R.A., has a charming study of a head for "The Golden Stairs" in brown crayon, on the screen. Ernest A. Waterhouse sends two or three subjects. "Over the Sand-hills," with its sunlit crest of hills and sheep, is the best. A corner picture of much power in drawing and colour, is R. Beavis's No. 104—

"Green Sussex fading into blue
With one grey glimpse of sea."

—a fine rendering of Tennyson's verse; the oxen-drawn plough is a strong piece of drawing and colour. We may also notice J. Henry Henshall's "No Compromise," Miss E. Martineau's "Sketch of Hastings" (110), S. P. Jackson's coast scenes (111), A. Hopkins's "Sea Study" (120), Sir Oswald Brierley's fine studies of marine subject and seascapes (209), and his fine Venetian subject (282). Birket Foster is still full of that sense of natural beauty and finished execution which delighted a past generation. His "Bridge over the Cluny" (147), "Water Mill" (154), "On Hambleton Common" (185), "Near Bonchurch" (303), are delightful in drawing and colour. George A. Fripp sends several very beautiful studies of coasts. His "Coast of Sark" (157) is a delightful rendering of stratification of rock and of luminous colour. Mr. Alfred W. Fripp has one fine drawing of the Lion Rock, Dorset (164), and Charles E. Fripp several sketches and drawings of foreign subjects of interest. H. G. Glindoni has a large figure subject entitled "Billeted" (215), an interior of tavern in which a number of soldiers and drummers are seated, drinking and playing dice, a scarlet-coated captain good-humouredly chucking under the chin the daughter of the host, who looks indignant at the familiarity. E. K. Johnson's "Birthday Ode" is a cleverly-drawn garden scene. We see also some good work by J. W. North (170); Edward F. Brewtnall; Robert Little (143), a graceful figure-study; some characteristic sketches by William Callow, "Barnard Castle" (121); and a very clever study, "Domestic Troubles," by John Burr; and others by R. Thorne Waite, and pen-and-ink sketches by Du Maurier on the screens.

THE SOCIETY OF ARCHITECTS.

THE second ordinary meeting for the present session of the Society of Architects was held on Tuesday evening at St. James's Hall, Picca-

dilly, when there was a large attendance of members and lady visitors. Mr. William Allport, F.S.I., member of council, occupied the chair. Three nominations for membership were announced, and the following eleven new members were elected:—Frank Eumley, Johannesburg and Pretoria, S.A.R.; William Cecil Jackson, Skellington, Grantham; Jowett Kendall, Calverley-chambers, Victoria-square, Leeds; Edwin Fewster Waugh Liddle, 24, Collingwood-street, Newcastle-on-Tyne; Arthur Newsome, Queen's-square, Middlesbrough; Henry Charles Portsmouth, Castle-buildings, Swansea; Ernest Ryley, Imperial-chambers, Albert-street, Derby; Lewis Frederick Shove, 49, Apsley-road, Clifton, Bristol; Percy Bertram Stradwick, The Corner, High-street, Bromley, Kent; Joseph Swarbrick, A.M.Inst.C.E., 44, Brazenose-street, Manchester; and Thomas George Williams, 3, Cable-street, Liverpool.

The Chairman said he regretted to state that Mr. G. W. Usill had been unable to prepare his promised paper on "Architecture and Landscape Gardening" owing to ill-health. Their energetic secretary, Mr. G. A. T. Middleton, had, however, been good enough to come forward at short notice, and would give an illustrated lecture on

SOME TEMPLES IN GREECE AND SICILY.

MR. MIDDLETON said he thought we were rather apt to overlook the claims to our attention of the many temples erected outside Greece, and he had therefore thought that an attempt to compare the Classic work in Greece itself with that executed in one of the Greek colonies, could hardly fail to be of interest to many, even though the materials for comparison had been hastily compiled. He proposed, therefore, to show that evening, by the oxy-hydrogen light, between 20 and 30 views of temples in Athens and Sicily, reproduced from photographs taken this summer by Mr. Soames, a London architect, and kindly placed at his disposal. Of the Doric temples in Greece, the lecturer continued, the best known are undoubtedly the Theseum and the Parthenon. The latter has been exhaustively described already before this Society, in a paper read by Mr. Stanley Peach, on April 13, 1886, and then illustrated by restored plan and side elevation of this most refined and dignified of Doric edifices. It stands alone as an octastylar Doric temple, and this fact, neglecting its many wonderful refinements, gives it a breadth which is to some extent lacking in the more usual hexastylar form. Even in its ruined state—for its one-time use as a powder-magazine had a somewhat damaging effect upon it—it still remains as a wonderful monument of genius, a fit crown to the height of the Acropolis at Athens. Its beautifully delicate, graceful, yet masculine sculpture, has been renowned through all ages. The Theseum, standing in the plain close by, and finished as early as B.C. 465, is, upon the contrary, a typical and not an exceptional example, and serves the better as a type that it still remains almost perfect. The proportions of its order are very similar to those of the Parthenon, but the rake of the pediment is considerably greater, and its sculpture, to judge from that in the British Museum, is bolder and less refined. If it be in Greece, however, that we find the most finished examples of this order, it is rather in the provinces that we find those of greatest interest. Athens was built only between two great wars, and the period of building extends therefore over a comparatively short space of time. In Sicily, on the contrary, there are noble examples of much earlier date, and although it is most difficult in many instances to state with any degree of precision when the temples were erected, there yet appears to be a regular succession of examples from the earliest Doric times—in the estimation of some as early as 800 B.C.—until the island was overrun by the Carthaginians in B.C. 407-408. This exceedingly early date is given to the temple at Solunto, and, without accepting this to the full, it is borne out to some extent by the sturdiness of its proportions, by the lower third of the column being unfluted, by the flutes when they occur being sixteen in number (found in some other Sicilian examples also, as at Paestum and Girgenti), and by the very much compressed echinus to the capital. Upon the other hand, there are enrichments, such as the leaf and dart, carved upon some of the mouldings, and the spacing of the columns is so widely apart that two triglyphs appear between each pair of shafts. The

Temple of Neptune at Paestum (or Poseidonia) is one of the best-known examples, for its shell remains almost intact, and it is mainly remarkable for its greatly projecting echinus, a feature which some authorities consider to be characteristic of provincial work, forgetting that such a widely different example as that at Solunto exists close by. The fact that, being a hexastylar temple, it has fourteen columns on each flank, is scarcely an eccentricity, seeing that various examples differ considerably in this respect. At Selinus there are the ruins of several great hexastylar temples, evidently destroyed by earthquake, for the columns of that by the seashore have fallen outwards in all four directions. The result of their destruction has been to bring the details within easy reach of inspection, and the great capitals, with flat and widely-projecting hyperbolic echinus, can readily be examined. The triglyphs, too, show an appreciation of the values of small refinements which is worth notice, in the wave form of the terminal stops to the sinkings; and the sculpture, ascribed to any date between 628 and 450 B.C., is worth comparing in its early vigour with that upon the Parthenon. At Lepanto, there remains the shell of an unfinished temple, having no cella, authorities differing so widely as to the time of its erection as to name the date of its relinquishment as either 580 or 609 B.C. Its heavy proportions (for the entablature is half as high as the columns) seem to bear out the contention for the earlier date; but the historical events would rather lead us to believe that the latter was the more likely. It will be noticed that there is no stylobate, its place being taken by a flat circular drum of stone at the base of each column, somewhat larger in diameter than the column itself. That the columns were not fluted was possibly due to the fact of the work being unfinished; but the evidence in support of the contention that flutes were commonly cut *in situ* is scarcely complete, and there is distinct proof that the contrary sometimes obtained. This is afforded by an unfinished capital intended for the Temple of Concord at Girgenti (Agrigentum), where the shallow sinkings for the flutes can be distinctly seen. The shell of this temple still exists, and the semi-circular arches in the side walls of the cella will be noticed with interest.

There are other temples at Girgenti, each of interest—that of Juno for its great massiveness, and that of Castor and Pollux for its many unusual points of detail. The stops to the flutes appear rather as festoons below the echinus, which latter is deep, and with comparatively little projection. The leaf and dart again appears carved upon the bed-moulding to the cornice, and the topmost member of the pediment cornice is the ogee in place of the usual oval, with a very small carved bead above it to divide it from its fillet—an exceedingly beautiful and rare combination. The Doric order was undoubtedly the favourite of the Greeks, and was employed by them, both at home and in their colonies, in all their more majestic buildings. It was to the Ionic, however, that they turned whenever they desired a gem of more than usual elegance; and it is well to bear in mind that at Athens, at least, the two orders were employed contemporaneously. It is there, too, that the two most perfect Ionic works are to be found—a third, the Temple on the Ilyssus in the plains, having existed also so recently as to be fully described in Stuart's book. Of the two existing examples, the earlier is that known as the Temple of Wingless Victory, existing in Stuart's time only in scattered fragments, since pieced together by Rosso Schuberl, and re-erected on its original site just without the Propylæa of the Acropolis. It is so beautiful, and so little known, that a few words of description may not be out of place. It is quite small, measuring but 28ft. by 17ft. externally, stands upon a stylobate of three steps, is tetrastylar and amphi-prostyler. The base consists of a narrow roll, a side shallow cavetto, and another deeper roll above, each member separated from the next by a fillet, and the upper roll richly fluted, and this base is carried round the cella, as well as being used to the columns. The columns themselves are of the usual Ionic form, and the volute of the capital drops far below the level of the fillet, which separates capital from column, being generally deep in character. Round the cella three plain off-sets lead to an abacus, similar to the very slight one over the capitals. Above, the architrave is in three stages, and this is surmounted

by a sculptured frieze, only part of which has been found, all superincumbent work being missing. The other Athenian example of an Ionic temple, the Erechtheum, is much better known. This triple temple was erected within the walls of the Acropolis, and is generally ascribed to so late a date as about 450 B.C., a former temple upon the same site having been destroyed a few years earlier. As the Parthenon has been generally considered to be the greatest example of Doric, so has the Erechtheum of the Ionic. It exhibits more variety of outline than, perhaps, any other Grecian building, with ample carved enrichment placed exactly where it would be most effective. No sculpture is more beautiful than that of the caryatid figures to the altar-porico; no carving is more exquisite than the honeysuckle ornament upon the frieze of the largest Ionic building, the Temple of Diana at Ephesus. The remains are fragmentary, and but recently discovered; but those which are in the British Museum are of wonderful beauty. The great Ionic capitals show how even this enriched order is capable of being treated so as to express majesty, and may be well compared with the rich Corinthian capital, destitute of volutes, from the same building, while the carver and the sculptor will find there many a model worthy of protracted study.

Mr. GEORGE BAINES proposed a vote of thanks to Mr. Middleton. This was seconded by Professor HENRY ADAMS, who observed that their versatile secretary had shown them that neither in Athens nor in Sicily could modern conditions of building operations have prevailed when these temples were erected. There was manifestly no working by piece, no penal clauses limiting the time for completion, and no clients desirous of obtaining a building for half its proper cost.

Mr. FREDERICK JOHNSON, formerly a judge in Jamaica, supported the vote of thanks, remarking that to those accustomed only to the modern reproductions of Greek art, such as was seen at St. Pancras Church, Euston-road, these photographic views came as a pleasant surprise, while the Society was to be congratulated on having a secretary who could without warning put the points before them in so clear and graphic a manner. The vote was heartily accorded, and duly acknowledged.

THE L.C.C. AND THE ALBERT PALACE.

THE future maintenance of the Albert Palace at Battersea as a free place of recreation is assured, the London County Council having agreed at their meeting on Tuesday to apply to Parliament for power to accept the palace provided the freehold of the building and grounds is handed over to them free of expense.

The matter came before the County Council in the form of a report from the General Purposes Committee, who submitted the conclusions at which they had arrived with reference to the acquisition of the palace and grounds as a place of recreation for the public. The Vestry of Battersea had passed a resolution agreeing to contribute the sum of £5,000 towards the purchase of the building on the following conditions:—(1) That the Council should contribute not less than £5,000, and should maintain the whole of the premises free of cost so far as the vestry was concerned; (2) that the amount necessary to complete the purchase and pay costs should be contributed by either public or private subscription. The committee had also been informed that, in addition to the £5,000 offered by the vestry, a most generous offer, first of £10,000, and afterwards of an additional £3,000, had been made by Mr. J. Passmore Edwards, the proprietor of the *Echo*, the *Weekly Times and Echo*, the *Building News*, and other journals, making altogether £18,000 towards the purchase-money. They had further been given to understand that, provided the Council would undertake to maintain the palace, efforts would be made to raise by public or private subscription the remainder of the sum required to complete the purchase, and to put the building into a fair state of repair. They thought such an opportunity of securing for the people of London a building like the Albert Palace should not be lost. Should the Council decide to accept the charge of the palace and grounds, they were of opinion that they could be more economically managed and maintained as part of Battersea Park. They had had a report on this basis from the architect of the Council, and his estimate was £4,700. For the information of the Council, they gave

the following particulars with regard to the palace. The cost of the building was, they understood, over £100,000, apart from the value of the site. Including Connaught Hall, it covered three acres of ground. The building was divided into two portions, one, on the north, of iron and glass after the manner of the Crystal Palace; the other, on the south, of brick and quarried stone. The organ in the palace was considered to be the largest and finest in England, and cost £5,000. There was also a large picture gallery specially built for the purpose. The committee recommended: "That, subject to the Albert Palace, together with the grounds attached thereto, being handed over to the Council free of expense and in good repair, the Council do apply to Parliament in the next Session for power to accept the gift, and to manage and maintain the palace and grounds as a place of recreation for the public."

Mr. John Burns, M.P., explained that the palace cost about £100,000, and was within a few feet of Battersea Park, with which it could be connected by an underground passage. Seeing that the vestry had contributed £5,000 and Mr. Passmore Edwards, after giving £10,000, an additional £3,000, and since last week a further sum of £2,000, making £15,000 in all, the Council ought surely to undertake the cost of maintenance. As to what they would do with the palace, it would become, practically speaking, a winter-garden, a palace of physical recreation, a small park with a roof. He wanted this palace as a rendezvous for 'Arry and 'Arriet as a counter-attraction to the public-house, the low beershop, and many other things which were demoralising to the labouring poor. After a long discussion, during which the recommendation of the committee was considerably amended, it was ultimately adopted in the following form:—"Subject to the freehold of Albert Palace and the ground attached thereto and the organ contained therein being acquired and handed over to the Council free of expense and any encumbrance and the building in good repair, the Council shall apply to Parliament in the next Session for power to accept the gift and manage and maintain the palace and ground as a place of recreation for the public; that provision be made in the Bill that the Council shall be free from the payment of local rates in respect of the Albert Palace and ground, and with power to the Council to make from time to time such reasonable charges for admission on such occasions as the Council shall think fit, with power to let all or part at a rental from time to time."

THEATRES.—XIII.

By ERNEST A. E. WOODROW, A.R.I.B.A.

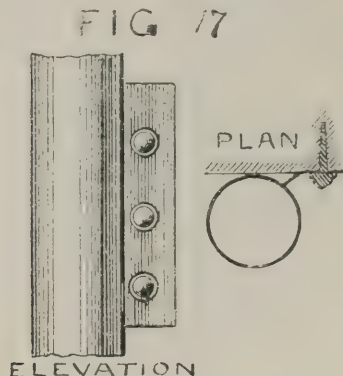
NO review of the opinions of experts upon theatre panics would be complete without a full reference to Sir Eyre M. Shaw's views on the subject. Speaking especially of staircases, which is the point we must still further consider in this chapter, he says: "The auditorium proper cannot itself be subdivided, but the audience can be, and each portion ought to have a separate place for entrance and exit according to price, so that, in case of an alarm, or of anything happening which would require a sudden clearing of any part, there would be no obstruction at the immediate point of exit from the seats. It would be desirable that each portion of the audience should leave the building altogether by different passages, stairs, and doors, but this is not absolutely necessary for safety. If the several portions can leave their seats without obstruction, they may, without much danger, be allowed to join at some little distance; but in this case they should not be allowed to meet in a common passage either end on, or, if it can be avoided, even at right angles. It is much safer for the two streams to take the general direction of the common passage before they enter it."

The views of the L.C.C. as expressed in their tenth regulation differ somewhat from this, for therein two separate exits are demanded for every division of the audience, as already explained in a former chapter.

The London County Council's regulations require that staircases "shall be supported and inclosed upon all sides by brick walls not less than 9in. thick, to be carried down to the level of the footings." The actual wording in the present issue of the regulations is *footways*, but this is evidently a misprint. Mr. Nevill took great exception to a similar rule of the late Metro-

88. Lead pads to wall hooks:—

Where pipes are fixed with hooks a piece of lead is to be placed between the pipe and the



hook, and care is to be taken that the hook is not driven in so tight as to injure or contract the pipe.

89. Direction and inclination of pipes:—

All pipes to be laid to the direction and with the falls required, and all the falls are to be in the direction of the flow.

90. Bottom length of vertical pipe:—

The bottom lengths of all vertical pipes are not to be fixed until the work above them is completed, in order that all obstructions may be detected and removed before they are fixed.

BENDS.

91. Radius of bends:—

All bends to have wide sweeps, and the bore of the pipe to be kept full size throughout, and the lead of equal thickness. Dummies, and not bobbins and followers, to be used where possible in forming bends.

SOIL-PIPES.

92. Size of soil-pipes:—

Table of conditions under which 3½ in. or 4 in. soil-pipes should be used*:—

Diameter of soil pipes.	Number of w.c.'s to be served.	Class of trap under w.c.	Diameter of anti-siphonage pipe.	Height of top of soil-pipe above drain.	Height of top of vent-pipe above drain.
3½ in.	Not exceeding 4 tiers of single closets.	Anti D	2½ in.	Under 50ft.	Under 75ft.
Ditto	Not exceeding 2 tiers of double closets.	Ditto	2½ in.	Ditto	Ditto
4 in.	Exceeding 4 tiers of single closets.	Ditto	3 in.	Above 50ft.	Above 75ft.
Ditto	Exceeding 2 tiers of double closets.	Ditto	3 in.	Ditto	Ditto
Ditto	Exceeding 4 tiers of single closets.	Round trap or any trap other than anti D trap.	3 in.	Ditto	Ditto

* For buildings of great height, I should recommend that the height should be divided into sections, each division containing not more than four tiers of closets, and each division being fitted with a separate soil-pipe. This would prevent the traps of the lower closets being siphoned out by the momentum of the discharge from the top closet. This momentum would be very great in a building of eight or ten stories. In this arrangement the soil-pipes of the lower closets would act as the vent-pipe of the upper closets (See Fig. 18.), or separate vents might be provided for each soil-pipe.

93. Weight of lead soil-pipes:—

The soil-pipes, unless otherwise specified, to be of 8lb. lead.

94. Soil pipe inside of house†:—

Soil-pipes fixed inside the house to be of 10lb. lead.

95. Curved pipe at foot of soil-pipe:—

At foot of soil-pipe put a curved pipe next to curved channel in inspection chamber (see Fig. 19).

† Soil-pipes should not be fixed inside a house, unless it is absolutely unavoidable.

WASTE-PIPES.

96. Direction of waste-pipes and bends to do:—

Waste-pipes from all flushing-tanks and sinks,

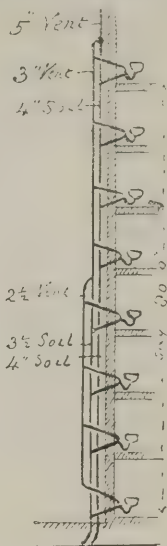


FIG. 18

baths, &c., to be carried downwards in as direct a line as possible to gullies, drains, &c., and all necessary bends to be as easy as possible.

97. Wastes and traps of equal diameter:—

The wastes and traps of laboratory basins to be

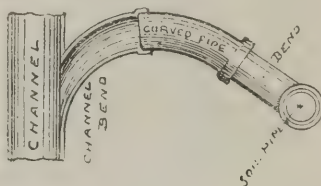


FIG. 19

of one diameter—viz., 1½ in. traps and 1½ in. branch wastes.

98. Waste-pipes to discharge vertically into trap:—

All waste-pipes from flushing cisterns, sinks, baths, &c., to discharge vertically over the standing water in the gully.

99. Waste-pipes connected with gully:—

All waste-pipes from sinks, baths, &c., unless otherwise specified, to be fixed at foot into socket of oblique arm of gully.

100. Pipes discharging into heads:—

Waste-pipes discharging into open heads to be

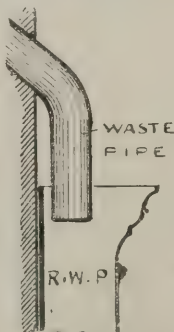


FIG. 20

carried within 1 in. of the bottom of the head (see Fig. 20), and to discharge vertically into the pipe.

101. Wastes entering traps above standing water:—

All waste-pipes to enter traps above the level of the standing water.

102. Bath waste:—

Put 2 in. lead waste for bath.

OR. Put to Bath a 3 in. lead waste.*

* This should be used only to baths which have a correspondingly large outlet.

EXTENSION OF THE PUBLIC RECORD OFFICE.

THE designs of a new building intended as the first of a series of additions to the Public Record Office have just been prepared by the permanent staff of H.M. Office of Works, under the direction of Mr. John Taylor, F.R.I.B.A., surveyor of Her Majesty's Works and Public Buildings in London. The foundations will be completed in a few days, and tenders are now invited for the superstructure. The foundations are of Portland cement and gault bricks. In digging, the workmen came across several pieces of old pottery, which have been lodged at the Office of Works. The main, or Chancery-lane, front of the building will be Gothic in style, and faced with Portland stone and Kentish rag, harmonising with the existing building by Sir James Pennethorne. A second block to be built three years later will involve the demolition of Rolls House and connect the structure now in hand with the portion built some years ago. Subsequently, a third block will be constructed on the south side extending towards Fetter-lane, and the whole range of buildings will then form a quadrangle 40ft. wide. A considerable space will be left open at each end of the building. An arched roadway will give entrance from Chancery-lane to the quadrangle and thence to Fetter-lane. The north wing of the Record Office will be carried upon arches over the Rolls Chapel, and the shell of that 13th-century building, with its interesting monuments and its rich stained glass, will thus be preserved, and possibly utilised for the exhibition of some of the most remarkable documents in the possession of the Record Office. Rolls House will be taken down to make way for the north wing of the department; but a fireplace, some cornices, and the memorial standing in the wall over the seat formerly occupied by the Master of the Rolls when the building was devoted to legal purposes will be removed and preserved. The block now being built will cover a site 225ft. long and 65ft. wide in its broadest part, and consist of a basement and three lofty floors. The northern portion of the new building will be used for the reception of records and State papers, the southern part being reserved for the officers of the department. Elaborate precautions are being taken against fire, and the building will be as nearly as possible fireproof construction. The flooring will be fireproof; iron and stone are to be used for the staircases; the windows are to have stone mullions and iron lights, and the roof will be exclusively iron. There will be exceedingly little wood of any kind in the building. The repositories, entered in every case through iron doors, are to be about 17ft. by 24ft., and paved, for the better preservation of the papers, with oak blocks, closely sealed upon the concrete floor. Hydrants and other necessary appliances for fire extinction will be provided on each floor, and fireplaces will be erected only in the rooms of the officials; but the southern division of the building containing these apartments will be shut off from the other portion by iron doors. The remainder of the rooms will be heated by hot water obtained from boilers in the basement. Electricity will be the sole illuminant, gas not being introduced into any part of the building.

On Saturday, the consecration of the new chancel which has been added to the Gravesend parish church at a cost of £1,200 was performed by the Bishop of Rochester. The church was licensed for Divine service in 1497, and consecrated by Bishop Fisher in 1510.

Major-General Hutchinson, inspector of railways, was engaged during the whole of Friday inspecting the deviation railway No. 5 (Liverpool and Manchester), between Flixton and Urnston, accompanied by Mr. W. G. Scott, engineer of the Cheshire Lines Committee; Mr. E. Leader Williams, chief engineer of the Manchester Ship Canal Company, and the members of their respective staffs.

The fresh works added to the Museum of the Luxembourg on its reopening include M. Detaille's "Reddition de Huningue," Paul Baudry's "Portrait de Peyrat" and "La Vérité"; Meissonier's "L'Attente" and "Jeune Femme Chantant," left to the Luxembourg by the artist himself; a landscape by Pelouse, M. Carrière's "Maternité," a "Jeune Fille au Piano," by M. Renoir; M. Besnard's "La Femme qui se Chauffe," and M. Fantin-Latour's "Un Atelier aux Batignolles," with portraits of Manet and Zola.

CONTENTS.

The New Works Department of the London County Council	761
Architect-Specialists	763
Royal Society of Painters in Water-Colours	763
The Society of Architects	764
The L.C.C. and the Albert Palace	765
Theatres.—XIII.	765
Draining and Plumbing Specification.—II.	766
Extension of the Public Record Office	768
The Building News Directory	XIII
Our Illustrations	769
Wayside Notes	788
Obituary	788
The Old Revolution House, Whittington	789
Echo in Buildings	789
St. Philip's Church, Stepney	789
Notes from Paris	789
Competitions	790
Architectural and Archaeological Societies	790
Building Intelligence	791
Correspondence	791
Intercommunication	792
Legal	793
Legal Intelligence	793
Water Supply and Sanitary Matters	794
Our Office Table	794
Meetings for the Ensuing Week	795
Trade News	795
Stained Glass	796
Tenders	796

ILLUSTRATIONS.

THE NEW CITY OF LONDON GIRLS' SCHOOL.—ST. PHILIP'S CHURCH, STEPNEY.—COTTAGES AT LONGFORD.—A HOUSE AT WEYBRIDGE.—HOUSE NEAR WINDSOR FOR THE DUKE OF SUTHERLAND.—AN OLD HOUSE IN ROUEN.—SOUTH PORCH OF THE CHURCH OF ST. GILLES, ROUEN.—HOSPITAL FOR INFECTIOUS DISEASES AT KEIGHLEY.—THE OLD REVOLUTION HOUSE, WHITTINGTON.—CHURCHES OF ST. MARY MAGDALEN AND ST. GREGORY-BY-ST. PAUL, CITY.

Our Illustrations.

CITY OF LONDON SCHOOL FOR GIRLS.

This school owes its origin to the founder, Mr. William Ward, of Brixton, who died in October, 1881, leaving the sum of £20,000 to the Corporation of the City of London for the purposes of establishing a high school for girls to correspond with the City of London School for Boys; the school to be built upon land belonging to the Corporation at the time of the bequest. Considerable difficulty arose in obtaining a suitable site to answer this condition, but finally the Court of Common Council, upon the recommendation of the City Lands Committee, decided upon the site on which the new building is now being constructed, and situated on the east side of the middle road, not yet named, between the Victoria Embankment roadway and Tudor-street, and adjoins on the southern side the Guildhall School of Music. The site, which has an estimated market value of £10,000, has a frontage of 71ft. 6in. and a depth of 51ft. 6in., giving an area of 3,683ft. superficial. Owing to the nature of the ground it has been necessary to go down to a depth of 26ft. to obtain a solid foundation; the concrete is to be of Portland cement, and the brickwork of the basement will be carried up in cement. On the basement floor, the ceiling of which will be 3ft. above the level of the pavement of the street, will be placed the cloak-rooms, lavatories, and recreation room, as well as boiler-room, &c. On the ground floor there will be an entrance-hall, the lady principal's room, the secretary's office, and two class-rooms. The two floors above will have five class-rooms each, and on the third floor four class-rooms, each floor with a small lavatory and w.c. The rooms on the third floor will be provided with sound-proof doors of communication, enabling two or more rooms to be used together at once. On the fourth floor is arranged a luncheon-room, 70ft. by 28ft. 6in., and 16ft. high, with kitchen, &c. On the attic floor will be rooms for the housekeeper. A small lift will be provided for raising coals. The class-rooms will be 22ft. by 17ft., with two smaller rooms, 16ft. 6in. by 13ft. 6in., the height 13ft. in the clear. The floors will be of Homan and Rodgers' fireproof construction, with boards and joists over. The basement floor will be of asphalt on concrete. The warming will be by means of Boyd's ventilating stoves and hot-water radiators, fresh air being introduced to them; the extraction of vitiated air will be effected by valves opening into channels over the corridors, which will be connected with a shaft in communication with the furnace. The elevation to the street will be in the Anglo-Italian style; the material Portland

stone. The stairs will be wholly of oak. The architect is Mr. Andrew Murray (the City Surveyor); the builders are Messrs. Atherton and Latta. Accommodation is provided for 400 scholars at a cost of £16,000 for the fabric and a further £2,000 for the furnishing.

ST. PHILIP'S CHURCH, STEPNEY.
(For description, see page 789.)

COTTAGES, LONGFORD, KENT.

THESE cottages have been erected for Mrs. Tapping, at Longford, Kent, facing the main road from Sevenoaks to London, by Mr. Edward Bevan, builder, under the superintendence of the architect, Mr. Thomas Potter, of Sevenoaks. The materials used are, viz., for walls, good sound bricks, with light red facings, a slightly darker red tile for the weathertiling, and brown tiles for the roof, all supplied from the Danton Green Brickyard, close to the site.

HOUSE AT WEYBRIDGE.

THIS house was erected last year on the banks of the Wey, from the designs of Mr. J. Steward Taylor, A.R.I.B.A., at a cost of about £1,500. The materials are red brick and Broseley tiles. The cornice outside is of wood. The dining-room walls are panelled up to the ceiling. The work was extremely well carried out by the contractor, Mr. Albert Monk, of Lower Edmonton.

NEW HOUSE NEAR WINDSOR FOR THE DUKE OF SUTHERLAND.

THIS house is now in course of erection on a site abutting on the river between Windsor and Maidenhead. The materials used externally are red bricks and Winsley Ground stone, with carved brickwork at the bays, and porch in main front. The roofs will be of brindled tiles, supplied from the duke's tilery at Blurton. The interior of the hall will be panelled from floor to ceiling, and the dining-room will likewise have high panelled dado and ingle nook. All the ceilings of principal rooms are treated in simple manner of Elizabethan panelling and enrichment. The other portions of the house do not require description. The builder is Mr. C. F. Kearley, of Uxbridge and Kensington. The sanitary and hot-water work will be executed by Messrs. Bolding, and the whole will be carried out from the designs and under the superintendence of Mr. F. Lovell-Lee, of 14, Gray's Inn-square, for the sum of £4,613.

OLD HOUSE, ROUEN.

THIS is a good specimen of the old time domestic architecture to be met with all over Normandy. It is situated in a narrow street just outside the Booksellers' Court, which leads to the north porch of the Cathedral, and either formed part of the collegiate buildings or has been built on the site of them, and probably with their materials. Indications of pointed arches, now walled up to meet present necessities, may be seen in more than one place. Our illustrations are from original photographs kindly contributed by Commander Gladstone.

SOUTH PORCH OF ST. GILLES, CAEN.

It is somewhere stated that the Church of St. Gilles was originally founded by William and Matilda as a mortuary for the poor. If this be so no part of the original structure remains, and the porch shown in the picture is late fifteenth-century work. The church, as may clearly be seen, is disused, and more or less in ruins. The porch and its surroundings form a picturesque bit, heightened by the grass and wild flowers growing out of the crevices of the masonry. The church is situated close to the Abbaye aux Dames, which it faces.

HOSPITAL FOR INFECTIOUS DISEASES, KEIGHLEY.

THIS design was submitted in open competition, there being thirty competitors, and was placed second, receiving the first premium. The buildings are designed to accommodate thirty patients, divided over three pavilions, both sexes being equally provided for in each block. The administrative block provides for matron, doctor, six nurses, caretaker, &c., and the laundry block includes a two-stalled stable and ambulance, and near to, but isolated, is placed the mortuary. The entrance to the site is at the highest point, and the several buildings have been disposed so as to take advantage of the natural levels of the ground, which is situated on the side of a hill, and at the same time to be easily worked from the administrative blocks. The drainage would be disposed

of by subsoil irrigation on the Corporation land adjoining. Messrs. Marshall and Dick are the architects.

CHURCH OF ST. MARY MAGDALEN, OLD FISH-STREET, WITH ST. GREGORY-BY-ST. PAUL.

THIS parish church, which was rebuilt by Wren after the Great Fire of 1666, stood at the corner of Old Change and Knightrider-street. The name of Old Fish-street appears to have become obsolete. In the autumn of 1886 the church was again attacked by fire, which destroyed the roof, galleries, and internal fittings, leaving the external walls, which, being very substantially built of brick, faced with stone ashlar, remained comparatively uninjured till October last, when the work of demolishing the roofless and dismantled church was commenced, the site having been let on building lease by the Ecclesiastical Commissioners. The sketch shows the building as it stood in 1891. The tower stood at the north-west angle, and could be well seen from Lambeth-hill. The east front (towards Old Change) had three windows (the centre one blank) and an entrance-door, all similar to those on the south side. The church contained a monument to the Rev. R. H. Barham, author of the "Ingoldsby Legends," and Canon of St. Paul's, who was rector of the parish from 1824 to 1845; also a curious brass tablet, dated 1586, with the figure of a man and the following lines in black letter:—

"In God the Lord put all your truste,
Repente your former wicked waies,
Elizabeth, our Queene most juste;
Bless her, O Lord, in all her daies.
So Lord, encrease good counselors
And preachers of his holie worde,
Mislike all papistes desiers,
O Lord, cut them off with thy sworde.
How small soever the gift shall be,
Thank God for him who gave it thee:
If penie loaves to III poor foulkes,
Geve every Sabbath day for aye."

Both these monuments were fortunately saved from the ruins in 1886, and I am informed by the Rev. E. Hoskins, rector of St. Martin's, Ludgate, will be eventually placed in his church, with which parish St. Mary Magdalen is now united. Milizia, in his "Lives of Architects," says: "It has a nave and two aisles, and is 60ft. long, 48ft. wide, and 30ft. high. It is well-proportioned, and lighted by circular-headed windows."—CLARKE ASHWORTH.

ST. GREGORY-BY-ST. PAUL.

UPON the south-west side of Old St. Paul's Cathedral stood the parish church of St. Gregory, over which was the Lollards' Tower—"infamous, like its namesake at Lambeth, for the ill-treatment of so-called heretics." The church and tower are shown in the accompanying sketch, from a wood engraving of Old St. Paul's by Hollar, who was buried in St. Margaret's, Westminster. The exact site is marked by the present statue of Queen Anne, as will be seen by reference to the sketch plan, taken from Timbs' "Curiosities of London." The church was not rebuilt after the Great Fire, the parish being united with St. Mary Magdalen, Old Fish-street.—CLARKE ASHWORTH.

CHIPS.

Mr. Francis Braid, chief sanitary inspector, burgh engineer's department, Edinburgh, has received the appointment of sanitary inspector for the burgh of Kirkcaldy.

Plans have been prepared for the rebuilding of the Metropolitan Opera-house at New York, recently destroyed by fire, and it is hoped that the new edifice will be ready for the season 1893-4.

A feature of the forthcoming winter exhibition at the Royal Academy will be a selection from the water-colour drawings and designs of the late Marchioness of Waterford, including some of those exhibited last summer at the residence of Earl Brownlow, 3, Carlton House-terrace.

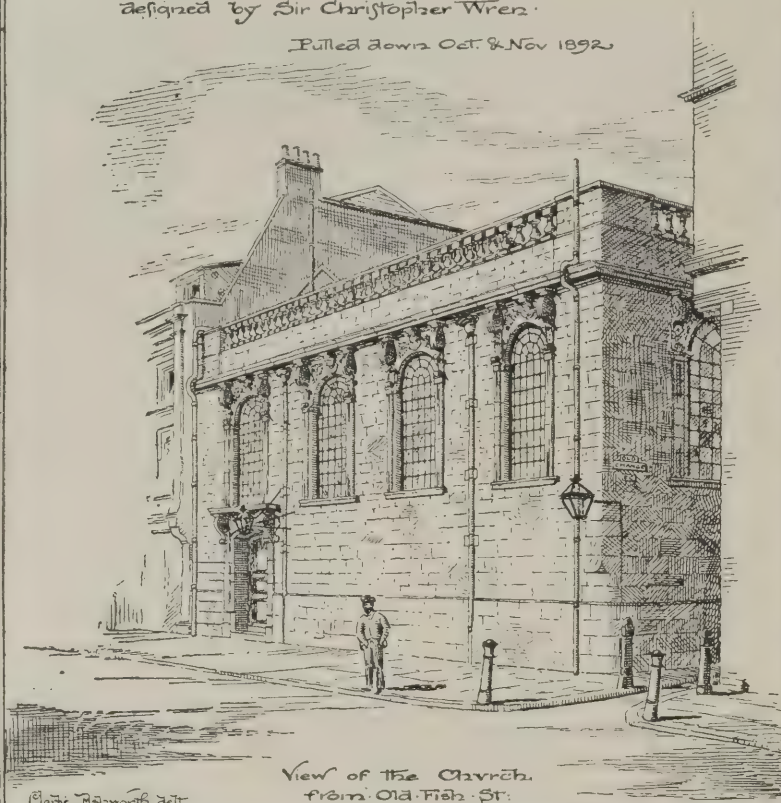
At a recent meeting of the Anthropological Institute, Major Temple drew attention to the new field of exploration offered by the caves of Burmah, which are rich in wooden carvings, glazed tiles, and images as well as tablets in terracotta, marble, alabaster, and other materials. These relics illustrate the ancient and modern phases of Buddhist worship.

The corner-stone of a new parochial hall for All Saints', Paddock, near Huddersfield, was laid on Saturday. The new hall will be Late Gothic in style, and is being erected from plans by Alderman Stocks, architect. The cost is expected, with furnishings, to be £2,000.

Ch. of St. Mary Magdalen: Old Fish St.
with St. Gregory and St. Paul

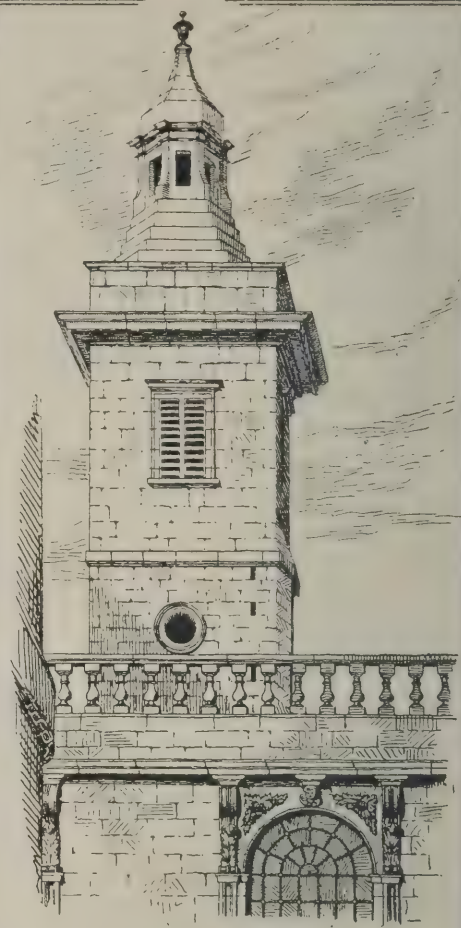
designed by Sir Christopher Wren.

Pulled down Oct. & Nov. 1892.



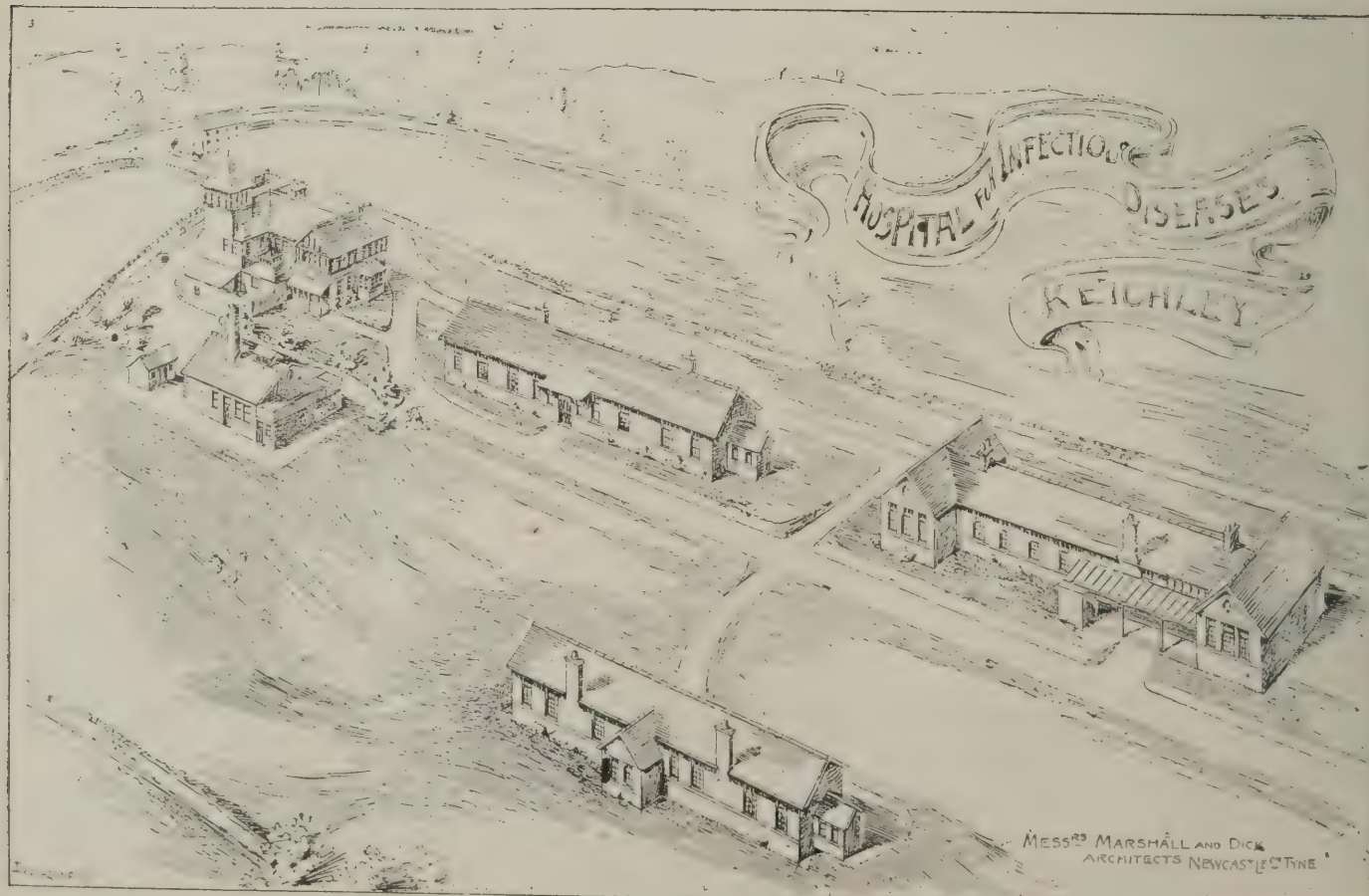
Clare Plummer del.

View of the Church
from Old Fish St.



View of Tower
from Lambeth Hill.

J. E. Langley sc.

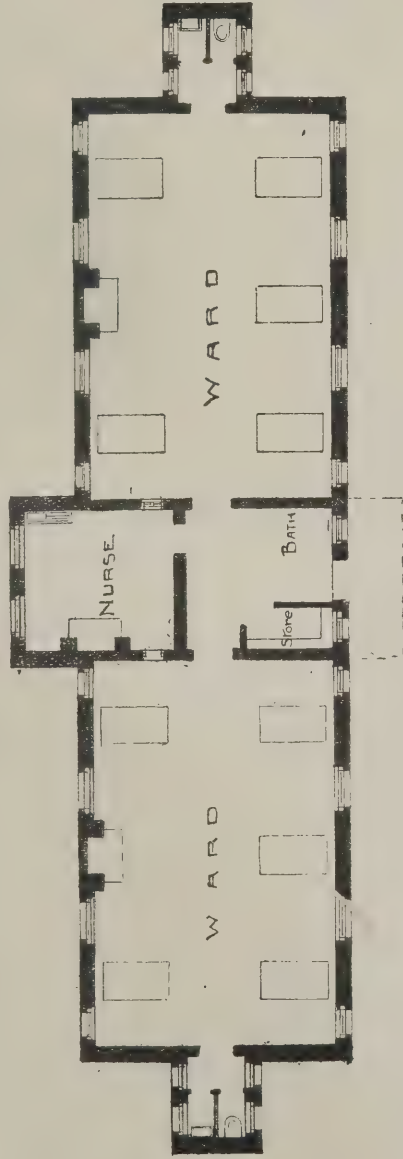


MESSRS MARSHALL AND DICK
ARCHITECTS NEWCASTLE-ON-TYNE

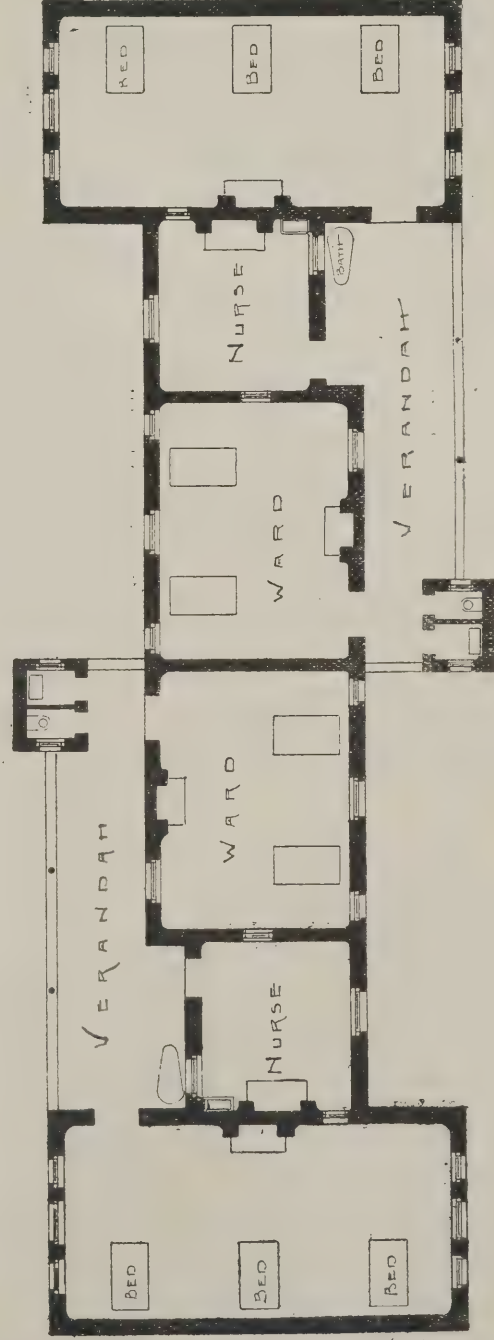
HOSPITAL FOR INFECTIOUS DISEASES AT KEIGHLEY -

MESSES MARSHALL & DICK ARCHTS

SCARLET AND TYPHOID WARD



ADMINISTRATIVE BLOCK



SMALL POX PAVILION



LAUNDRY BLOCK

WAYSIDE NOTES.

FROM a bath-house to a polytechnic institute, and back again to baths. What will be the next move of this very volatile Erixton building?

The new Tate Gallery will be placed upon the site, or a portion of the site, of Millbank Penitentiary. According to a statement made by Mr. Shaw-Lefevre, M.P., two-and-a-half acres will be devoted to the picture gallery. Another portion of the Millbank site is to be utilised for the purpose of new barracks, a portion of the barracks behind the National Gallery being then moved to Millbank, thus leaving room for an extension of the National Gallery. This latter building, therefore, is destined to become greatly enlarged when the National Portrait Gallery is completed, and the contemplated further extension carried out. As to the remaining portion of the Millbank site, it has been offered to the London County Council, between whom and the Government negotiations are now pending.

In receiving a deputation of the unemployed on Monday last, Mr. Shaw-Lefevre gave an interesting *résumé* of the expenditures now being made by the Government in public works. There is the third new post-office, larger than any of the other buildings, now being erected at a cost of £200,000; and a new story on the old post-office is costing £25,000; while in Clerkenwell there is in course of construction a new parcel-office at a cost of £75,000. On the Admiralty extension £300,000 is to be expended; on an enlargement of the Patent Office and Record Office, £125,000 and £70,000 respectively. In addition, there are numerous minor works in progress. The deputation of the unemployed received a very considerate hearing from Mr. Shaw-Lefevre, who stated that he would endeavour to expedite new works immediately contemplated by the Government.

I fear that the increase of building works is not likely to remedy matters very much, it being shown that the depression and distress is less in the building trade than other industries. Shipbuilding is again reported in a depressed state, men from more yards being discharged on account of slackness of work.

"Cut-and-cover-in" puzzled us the other day. The originators of the term would seem to wish to be understood to mean thereby the excavation of a cutting in which the tube of a tunnel is constructed, the earth being subsequently filled in and rammed.

A very sensible suggestion has been made that, if instead of large sums of money being annually expended in promoting Channel tunnel and bridge schemes that have no chance of getting through Parliament, a small amount were devoted to the purposes of harbour improvements at Calais, the Channel passage in rough weather would be rendered less fruitful of discomfort to passengers who are not the best of sailors. There are two Bills for tunnelling or bridging the Straits to be laid before Parliament next session.

When the "House" meets, by the bye, it will not know itself. In preparation for the opening of Parliament, I understand that the Office of Works has pushed forward and completed sundry alterations in the two chambers. The House of Lords has been thoroughly redecorated, and the celebrated frescoes are being touched-up by Mr. Cope, R.A. No structural alterations have been effected in the House of Commons, but a large expenditure has been made on the lobbies, a new refreshment bar having been fitted up in the central hall on the site of the post-office. A lift for ladies from the Speaker's-yard into the corridor leading to the ladies' gallery is included in the improvements.

Among the mottoes of the competitors in the competition for the new Government buildings at Victoria, B.C., as printed in the *Victoria Daily Colonist*, I see "Ta-ra-ra-boom-de-ay." If we continue to be Americanised in competition mottoes as in matters, we may expect in the competitions of the near future, "Knocked 'em in the Old Kent-road" and "Up I Come with My Little Lot"—very suitable the latter.

In his "Fortunatus the Pessimist," recently

published by Messrs. Macmillan, Mr. Alfred Austin alludes to the "dim religious light" in—"Cathedrals where unfaltering twilight dwells, Subduing souls to sympathy and prayer."

It was perhaps a good instance of the truth of the position that over-refining of works and essays may take away much of their freshness, that it happened that a hurriedly prepared paper by Mr. Middleton on "Some Temples in Greece and Sicily" should prove most delightful hearing. Mr. G. W. Ussill being unable to read his paper on "Levelling and Contouring," Mr. Middleton at short notice was fortunately able to fill the threatened gap. I was sorry when the lecture came to an end, as with excellent lime-light views of grand old buildings, and the pleasant discourse thereon, one could have desired its extension to double the length. I always come away from a lecture on Classical architecture with a strengthened opinion that it has been left for a nineteenth century of supposed enlightenment to crystallise "orders" out of the architectural remains of Greece and Rome.

Herr Schwerzsch, a young sculptor of Vienna, has discovered that a small torso among the Parthenon fragments in the British Museum does not pertain to the piece of sculpture commonly imagined, but forms part of the boy who stands leaning against the statue of Leucothes in the west pediment. Ultimately, perhaps, the true nature of all the Parthenon fragments at the museum may be determined. One Museum mason has succeeded in properly locating nineteen fragments.

A paragraph in the last *Athenæum* is so much to the point, that I reproduce it completely in these pages:—"A startling appeal for £20,000 is now being made by the Chapter of Lichfield for what they are pleased to call 'the needful reparation' of their cathedral church. As this scheme includes the entire renewing of the roof upon what the architects believe to have been the 13th century lines, while the present roofs are thoroughly sound and excellent of their kind, we are astonished at the audacity of the language which the Chapter have sanctioned. The roofs and other parts of the church that it is now proposed to sweep away are chiefly due to the energy and skill of the great bishop of the Restoration period—Bishop Hackett. It is a monstrous thing to try to blot out this page of history as told in the fabric of Lichfield Minster."

So I think. The use of the term "needful reparation" is deceiving. Surely the idea of restoration back to a certain date has been long relegated to the past, along with other barbarous notions! We have advanced further than this, and are surprised that cathedral chapters or architects can be found to advocate such a plan. I trust that wide notice will be taken of this proposed "needful reparation" of old Lichfield Cathedral. As the *Athenæum* says, it is monstrous.

Winter gardens are most excellent institutions, and I am glad to see that the Brighton Corporation propose to erect such a building. In this climate, with its damp, cold, winter days and purely theoretical springtime, it is something for the people to be able to repair to some cheerful shelter, such as that afforded by winter gardens. Iron and glass being cheap in these days, there should be no excuse for seeing so few buildings of this class. That they are a source of great pleasure may be taken as certain, when we reflect that most men who build large mansions nowadays include a spacious winter garden. There should be more in London, and one at least in every town. I am glad to see that the County Council are taking over the Albert Palace for the use of the people. As the building has been generously offered to the Council if they will look after its maintenance and management, there should be no other course than that of accepting it. It will be a welcome resort for the inhabitants of Battersea. Similar institutions in other districts of London might well be brought into existence. They would have to be municipal affairs, as past experience has not shown glass houses of this kind in a favourable light as commercial speculations.

The annual dinner of the Society of Engineers will be held at the Holborn Restaurant on Wednesday week, the 14th inst.

OBITUARY.

WE regret to announce the death of Mr. Hugh Barclay, senior member of the firm of Messrs. H. and D. Barclay, architects, 245, St. Vincent-street, Glasgow, which took place on Friday night suddenly at his residence at 6, Buckingham-street, Hillhead, Glasgow. He was 64 years of age, and had been in the profession for 47 years. Mr. Barclay was a member of the Glasgow Institute of Architects, and acted on the Council of that body for a number of years. With his brother, Mr. David Barclay, who survives him, the deceased was the joint architect of the Greenock Municipal Buildings, built in 1879-82, at a cost of £120,000, the Glasgow Academy, and several churches and schools in Glasgow and Govan. A year ago he was predeceased by his wife, and leaves a family of two sons and three daughters. A portrait and biography of Mr. Barclay appeared in the *BUILDING NEWS* for July 4, 1890.

The death of Mr. James H. Bisset, of Aberdeen, builder, took place at his residence, Burnside House, on Thursday in last week, from heart-disease. Deceased was the only surviving partner in the firm of Messrs. P. Bisset and Son, builders. While a young man he emigrated to New Zealand. After his return to this country he took charge of the business which his father had founded, carrying out many important contracts in the city, among them being the building of Gilcomston Free Church, Rosemount Parish Church, Aberdeen Jute Works, and Rosemount Provision Works, and the laying out of Duthie Park. He was the first to use concrete in Aberdeen, and constructed the theatre in that city of that material. Mr. Bisset was a Liberal in politics, a justice of the peace for the county, and an elder in Free John Knox Church. Mr. Bisset was twice married, and was 55 years of age.

CHIPS.

The City and South London Electric Railway Company have given formal notice to the Lambeth Vestry of their intention to begin the construction of their extended line from the present terminus at Stockwell to Clapham-common, under the powers obtained by them under the Act of 1890.

Sir Frederick Leighton has received a memorial from the Sunday Society, bearing the signature of the President, Lord Brassey, and many past presidents, including Lord Rosebery and the Duke of Westminster, praying that the General Assembly of Academicians will take into consideration, on National grounds, the desirability of opening the Gibson and Diploma Galleries of the Royal Academy on Sundays.

A deputation of gentlemen waited upon the directors of the Midland Railway Company at Derby, praying that the company will construct a branch line from Padley Wood, on the Dore and Chinley Railway, to Millersdale, via Eyam, Hucklow, and Tideswell, a distance of nine miles, and so place Sheffield within twenty miles of Baxton. Mr. Turner, the Midland Company's manager, promised that an engineer should survey the route and report thereon.

The American School of Athens will shortly resume its excavations at Sparta, and at the Heraeum of Argos.

The operation of doubling the Somerset and Dorset line between Shepton Mallet and Binegar, which has been in progress for two years past, is now practically complete, and the new line was opened for traffic on Monday.

At the Llandudno Police-court last week Edwin Turner, described as an architect and builder, was fined the nominal penalty of 1s. and costs for obstructing the streets by leaving timber in front of a building in course of erection in Church-walk, Llandudno. The defence was that the practice was common in the town, to which it was replied that in future the commissioners would enforce their by-laws.

The dinner to the Worshipful Company of Plumbers is arranged to be given by the Lord Mayor as Master on Wednesday, the 14th inst.

A large block of livery stables in Silver-street, Bury, Lancs, was formally opened on Wednesday. The stables are two stories in height, will house 70 horses, and are fireproof throughout, the floor being of concrete. Messrs. Maxwell and Tuke, of Manchester, were the architects, and the contractors were Messrs. Thompson and Briery, of Bury.

A boot and shoe warehouse and offices, covering an area of quarter of an acre, have just been built in Mill street, Stafford. Mr. N. Joyce, of Greengate-street, Stafford, was the architect, and Mr. J. Jarvis, of County-road, in the same town, the contractor.

The "Old Revolution House"

Whittington

as Restored

W. Martin Ashmore
ArchitectTHE OLD REVOLUTION HOUSE,
WHITTINGTON.

THE village of Whittington, situate on the main road from Chesterfield to Rotherham, and about two miles from the former, possesses a few simple specimens of Old English domestic work. One of the least pretentious of these is the subject of the illustration. This cottage is a small portion only of the old Cock and Magpie hostelry, at one time an important wayside inn in these parts, and from time out of mind traditionally known also as the Old Revolution House. Here, we are informed, the Earl of Devonshire, the Earl of Danby, and Mr. John D'Arcy met on the eve of the memorable Revolution of 1688 to discuss important movements in furtherance of the plot for the overthrow of King James. For precise information as to where this meeting was held we are mainly indebted to the authority of local tradition, but that such a meeting took place at Whittington there appears to be ample written evidence to prove, the most authentic account being the references made by the Duke of Leeds himself (formerly the aforesaid Earl of Danby) in the introduction to his "Letters," printed in 1710, and quoted by the Rev. Samuel Pegge (afterwards Dr. Pegge), rector of Whittington at the time of the centenary celebration. Great demonstrations and rejoicings took place at Whittington in 1788 in celebration of the centenary of the Revolution, full accounts of which are recorded by local historians. Four years ago (1888) the bicentenary was celebrated on similar lines to its predecessor. At this time a generous offer was made by the owners to give the cottage to a committee of local gentlemen on condition that it be thoroughly restored and preserved as a relic of local antiquity. Lack of funds kept the project in abeyance for a long time, but at length the committee have taken the matter in hand, and the cottage has now been put into a substantial condition of repair, a considerable amount of restoration having become imperatively necessary, owing to the ruinous condition into which the place had lapsed in later times, a state of things not likely to recur now that the custody of the building has fallen into the hands of an interested and enthusiastic executive. It is to be hoped they will be followed by worthy successors, who will do their utmost to hand down to posterity this humble reminder of the great historical event with which it has become inseparably associated.

W. MARTIN ASHMORE.

ECHO IN BUILDINGS.

IN buildings of oblong form reflection or echo is often found due to the end wall and ceiling, and the angles formed by the walls and ceiling. Direct echo from the end walls, says Mr. H. C. Kent, M.A., in a paper read before the Sydney Architectural Association, "can be obviated by making the end wall elliptic, and by breaking it with recesses, or with a deep-stepped gallery, or by using absorbent materials, such as draperies; while secondary echoes can be greatly obviated by cutting off the angles with a curve, as well as by slight breaks in the side walls which will prevent the conduction of the waves along their surface." Deep square recesses in the walls, except in the end opposite the speaker, and deep square openings in the ceilings, such as lanterns, should be avoided, as these breaks serve to set up vibrations of a conflicting kind. Wood lining is recommended for the walls and ceiling by most writers; but Mr. Kent thinks it increases resonance and detracts from clear definition of speaking. The author thinks simple harmonic proportions desirable in buildings intended for music, such as the ratio 2 to 3 to 5, or 2 to 2 to 5, the first of these being that of the Free Trade Hall, Manchester; the second that of the old Surrey Music Hall. The Sydney University Hall has the dimensions 135ft. by 45ft. by 68ft. high, and these are found to give satisfactory results.

ST. PHILIP'S CHURCH, STEPNEY.

THIS cathedral-like church, erected at the cost of the vicar, the Rev. Sidney Vacher, was opened a few weeks ago, though the tower has yet to be built. The building was commenced in 1889. Mr. Arthur Cawston, A.R.I.B.A., is the architect; Mr. T. Higgs was the clerk of the works; and Messrs. A. Bush and Sons are the builders. The accompanying sheets of illustrations show some of the general drawings of the church, and we shall follow them up by a series of views and working drawings. The aim of the vicar was to build a perfectly useful building capable of seating a great congregation gathered in from his crowded and populous parish, situated to the rear of the London Hospital, Whitechapel, and the architect was instructed to design a structure worthy of Divine worship, making it bright and interesting as a refuge from daily toil and a bright spot 'midst squalid surroundings. The

nave is narrow, and the choir is short; but the wide double aisles afford ample space. Over the narthex in the tower there is a deep gallery. The morning or Lady-chapel is in the orthodox place to the east of the sanctuary, and its design somewhat corresponds with the plan of the similar chapel at Wells. This is an accident, however, as Mr. Cawston was unaware of the coincidence till after he had made his design. The centre pier is of Hopton Wood stone, supporting the vaulting, and the walls are faced with Sussex stone from Three Bridges, with the masonry in small scantlings. Common stock bricks are used for the general facing of the walls of the church, which are relieved with Bath stone dressings. Ancaster stone is used externally, with red brick for the walling. The cloister and chapter-house-like arrangement south of the church, makes a great feature in the plan, adding much to its interest and dignified approach. The lofty proportions and refined detail of the church may be readily judged by the scale drawings, which we now publish for the first time. The seating is mainly by chairs. The font is handsome, and has a spire-like cover suspended from the baptistery roof. The cost was, we understand, about £40,000.

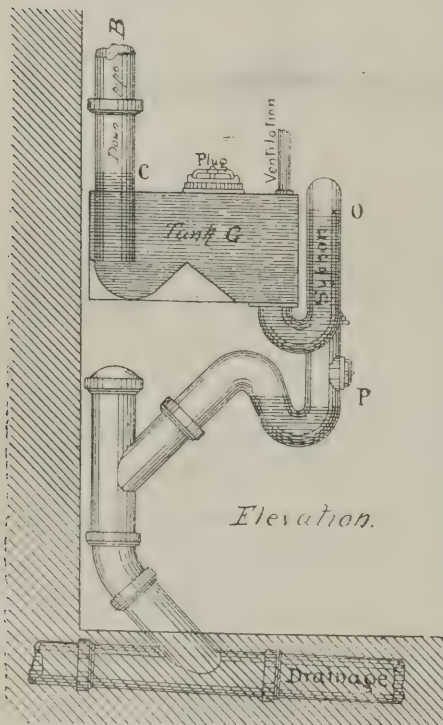
NOTES FROM PARIS.

AS I remarked in my last letter, the question of sanitary improvements at Paris is much talked over.

The "tout à l'égout," or system of total drainage, is that which will most probably be adopted. Unfortunately several trials which have been made in a rather incomplete fashion have turned the Parisian public against this system, but further successful trials will surely turn the opinion in favour of the adoption of the "tout à l'égout." The soil and matter from Paris will be drained into the country as far as Aubervilliers, where it will be converted and used for industrial purposes. The important question at present is to efficiently flush the system of drains, with the least possible waste of water, for Paris at the present moment is very scantily supplied with water, and especially potable water. For this reason a number of ingenious apparatus destined to avoid as much as possible the waste of water have been submitted to the sanitary authorities. That which seems to be most

certain in its working, and which has as far as present been approved of by the Municipal Council, is a system invented by Monsieur Lafforgue, architect; and as this may interest some of your readers, I subjoin a sketch drawing of the apparatus.

It works automatically, and by means of compressed air, and, according to the inventor, will save nearly 70 per cent. of the water now wasted in drainage of water-closets. The apparatus is exceedingly simple in arrangement, and, what is a great thing in the eyes of house proprietors, may be adapted to the system of closets at present in vogue. The down pipe B falls into a tank G of general dimensions about 20in. by 16in. by 14in. This tank, which is hermetically sealed, is furnished with a siphon of large diameter (5in). The tank is fed by a service pipe of very small diameter, allowing a very small quantity of water to gradually fill the tank. Rain and slop water may also be allowed to run into the tank. The soil, &c., falls by the down pipe into the tank, and there mixes with the water contained in the tank. The air in the portion of the siphon between O and P is compressed to a more or less degree. As soon as the level of the water in the tank attains the point C the air in the pipe between O and P becomes compressed to a great degree, and this pressure overcoming the water-seat P forces the water into the drains, and starts the siphon O, the whole contents of the tank being rapidly and forcibly drawn away into the drain pipes. This takes place each time that the water attains the level C. This apparatus has been tried in several



houses, and works very satisfactorily. Of course, as far as the science of sanitation is concerned, it can hardly be called a step forward, but still the adoption of such a contrivance is absolutely necessary for the present at Paris, where water is so scarce.

Since the cholera scare the "Assistance Publique" has been making great strides in the improvement and enlarging of the general hospitals. At the Hospital Cochin a large number of isolated buildings are being rapidly constructed, and in a new material about which I should like to speak later on.

The Pantheon is beginning to show signs of great deterioration in different parts, and the immediate attention of the council has been asked, in order to take the necessary steps for repairs. The first stone of this immense building was laid in 1764 by Louis XV., and the peristyle, with its twenty-two columns, supporting a triangular pediment, was considered a *chef d'œuvre*. The work in the pediment by David d'Angers has for subject "The Country Distributing Palms to its Great Men," and contains figures of Fénélon, Lafayette, Carnot, Voltaire, and Rousseau, and

other great men of the past day. A short while ago an immense block of stone, forming a portion of the sculptured work fell, and other portions are in imminent danger of following.

The works at the Buttes Montmartre are being recommenced; the gardens are nearly completed, and the large grotto over which will fall the water of a large waterfall is finished. The artificial rocks and rustic stairways are being rapidly formed. A large sum of money has been voted by the town for the full completion of these works, and it is said that these gardens will form one of the great curiosities of Paris.

The Minister of Fine Arts has named M. Roger Ballu inspector of fine arts at home and abroad; M. Armand Silvestre taking the place of M. Ballu as inspector. M. Delair is named "conservateur" of the Museum of Sculpture at the Trocadero.

At the Ecole des Beaux-Arts the prizes and medals for 1892 have been awarded; the Grand Médaille d'Emulation to M. Desperthes, who also carries off the Prix Abel Blouet.

In the concours of this past month, the subject being "A Prefecture for a Maritime Department," there was no first medal. Second medals were taken by MM. Durand and Bertrand, students belonging to the studios Redon and Gaudet. The subject for the sketch designs was "A small dock for gondolas in a park surrounding a sumptuous dwelling." Two medals were awarded for their sketch designs to M. Hulot and M. Pille.

The sketches for the interior decoration of the entrance rooms of the Salle de Fêtes of the Hôtel de Ville have just been exhibited at the Palais d'Industrie. The decoration comprises the walls, ceilings, and friezes of the two entrance rooms, the prize for the winning artist being about £2,500; there are also two other premiums of £120 and £80. Three hundred artists offered to compete, but only fifty sent in sketches for exhibition. The subjects chosen by the different artists were most varied. Mythological subjects abounded. There were several designs representing the friendship of France and Russia, a certain number contained views of Paris, the Madeleine, Champs Elysées, &c. Six artists are chosen to compete in the second degree of the competition. These are MM. Bonis, Danger, Delance, Ferry, Martin, and Simas. This final competition will be adjudged in April next.

It is the intention of the authorities to construct a Columbarium near the crematory furnace in the cemetery of Père La Chaise. The idea is to unite in one group all the services necessary to cremation, and form a kind of necropolis reserved for incineration. The monument, after the drawings of M. Fornigé, will present a double portico, divided longitudinally by a wall to contain the urns. This portico will surround the crematorium. The estimate for the building is nearly £30,000. Perpetual leases will be granted for £14 each urn, a fifth of this sum being devoted to charities.

The Union Syndicate of French Architects have decided to participate collectively in the Chicago Exhibition. The works will be represented by photographs, and divided into four sections—public monuments and schools, &c.; churches; private buildings, hotels, and smaller work; and industrial buildings. Casts are being taken from the finest of the architectural casts in the Trocadero Museum, representing French architecture, and these are being sent to the Chicago Exhibition.

The Association of French Architects has just sent in a petition to the Senate asking the Government to allow a free competition amongst French architects for the proposed new Opera Comique if, perchance, the design which has already been adopted should for any cause be put aside. The design submitted to the Theatre Commission, as far as present adopted, is due to MM. Duvert and Charpentier, architects. The adoption of a design not sent in in competition is much commented on here. The Parisian architects have thus decided to send in the petition, asking for a general competition, as was done for the Grand Opera in 1860. The building will be constructed on the site of the old Opera Comique, which was burnt down. The façade will not be on the Grands Boulevards. The total surface occupied will be about 16,000 square feet; a large amount of iron will be employed in the construction. The new theatre will have 1,514 places, instead of 1,598 in the old building, and will be entirely fitted with the electric light.

I hear since that the Provincial Societies of

Architects are also sending in a petition asking for a general competition for the Opera Comique. In July last, just before the closing of the Senate session, a vote was carried approving the reconstruction of this theatre by means of a financial combination proposed by four well-known contractors. The estimate for the building was about £140,000, the State allowing about £50,000 of the amount, the remainder being borrowed from the contractors, and repayable by the rate-payers in 76 years. M. Guillotin, the principal contractor, ordered and sent in designs which have been accepted by the Senate. The French architects are therefore justly annoyed at this manner of doing things, instead of either choosing a thoroughly qualified and well-known architect to get out the plans and design, or making the theatre a subject for competition.

ARTHUR VYE PARMENTER.

COMPETITIONS.

GATESHEAD-ON-TYNE.—The Gateshead School Board selected on Wednesday the designs in the competition for new schools at Shipcote. Nineteen plans had been sent in by architects practising in the counties of Durham and Northumberland, undistinguished by either name or motto, and each of these was marked by the clerk to the School Board with the name of a county. They were then hung for public exhibition during the past fortnight. At Wednesday's meeting the first place was awarded to Mr. Stephen Piper, M.S.A., County Chambers, Newcastle-on-Tyne, who was appointed architect of the schools; the plans by Mr. John Thompson, Newcastle, being placed second, and those by Mr. Pritchard, of Darlington, third. The schools are for 1,000 scholars, in three departments, and the cost was restricted to £7,000. The chief points in the selected plan were the skilful use made of the fall in site, left-hand and double lighting to every room, and compactness of arrangement. The basement of two departments is utilised as a gymnasium and cookery class-rooms, while a drawing class-room is placed in roof with north light.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

THE A.A. LYRIC CLUB.—The second concert for the present session of this social auxiliary to the Architectural Association was held at the old headquarters, the Mona Hotel, Covent Garden, on Friday, November 25th. Messrs. Percy Smith and C. O. Law were responsible for the programme, which included performances by Messrs. A. G. Turner, J. D. Butler, S. Richards, H. F. Hepburn, E. A. Lambert, C. O. Law, W. G. Churcher, H. Seton Morris, C. D. Imhof, and the A.A. String Band. The next concert will take place on Friday in next week, the 9th inst., and will be arranged by Mr. A. W. Earle. The club's annual Cinderella dance will be given at the Portman Rooms, Baker-street, on Wednesday, February 8th.

CHIPS.

A stained-glass window, presented to Esrick Church, near York, by Mr. and Mrs. J. G. Menzies, of Esrick Park, in memory of the late Duke of Clarence, was unveiled last week.

In recognition of the public services of the late Viscount Hampden, it has been resolved to place in the County Hall, Lewes, a copy of the portrait by Frank Holl, representing Viscount Hampden in his robes as Speaker of the House of Commons, and hung in the Academy of 1885. The cost will be defrayed by a county subscription.

A Bill for powers to construct an electric railway from Brighton to Rottingdean will be introduced into Parliament next Session. This railway, which will be nearly four miles in length, will commence near Preston Park, Brighton, and proceed along the beach and foreshore to Rottingdean. From the termination of the railway a jetty is to be constructed 200ft. into the sea.

A memorial rood screen was dedicated at St. Alban's Church, Leamington, last week. It is in 14th century style, and consists of a series of five cusped main arches, the centre one being much wider than the two on each side. Over the arches are canopies, with carved crockets and finials, and open tracery surmounted by an embattled cornice. The work has been executed in wainscot oak by Messrs. Cornish and Gaymer, of North Walsham, from the designs of the architect, Mr. William Bassett-Smith, of John-street, Adelphi, London.

Building Intelligence.

BEDMINSTER, BRISTOL.—St. Paul's Church, Bedminster, built in 1831, was reconsecrated on Wednesday week, a new chancel having been added to it. Formerly the church, although a large one, had as chancel a space of only a few feet, and the work just completed has lengthened the church eastward for a considerable distance, and provided a minister's vestry on the north side and an organ-chamber in the south of the addition. This alteration has been accompanied by a reseating of the edifice, open varnished pitch-pine pews being substituted for those formerly in use. The new chancel has a dark timber roof and a large eastern window, below which is a reredos. The organ has been shifted from the east end of one of the galleries into the organ-chamber, and the choir have seats in front of it. Mr. A. Barnes, of Bristol, was the architect, and Mr. Humphreys the builder.

EAST BARRY.—The ceremony of laying the corner stone of the new St. Paul's Church, East Barry, was performed on Tuesday. The church is designed in the 14th-century character, and to seat 530 persons. It is to be built of Catbybrook brick, both inside and out, with Bath stone dressings. There will be a nave, 70ft. by 24ft., with north and south aisles 10ft. in width, chancel 32ft. by 20ft., together with a south chancel aisle, organ-chamber, and vestries. The arcade is of pitch-pine, with traceried spandrels and octagonal shafts. The roof of the nave is an open-timbered one, and that of the chancel a barrel one, with moulded ribs. The tower is placed at the west end, and is open to the nave by a high arch. The roofs will be covered with Welsh green slates. The present contract is for the nave, south aisle, and heating-chamber, at a cost of about £2,000. The architects are Messrs. Kempson and Fowler, Llandaff, and the builder is Mr. Wm. Richards, jun., of Barry.

MOLD.—The new English Presbyterian church, Mold, was opened last week. The style is Gothic, and the church measures internally 53ft. 6in. by 45ft., and has accommodation for over 450 persons. The plan is arranged with circular pews, which incline towards the pulpit, and are constructed in a gallery form at the sides and back. The building is designed in one span. At the rear are the school buildings, which consist on the ground floor of a schoolroom measuring 28ft. by 27ft., to accommodate 200 persons, and three classrooms. A lecture-room, seating 250 persons, is constructed over the latter, and also forms an additional schoolroom. The walls are built of stone. On the west side of the front façade, and occupying the angle of site, is a tower with spire. The organ-chamber is formed in the side transept, and projects from the main building, and the walls are finished in a gable. The principal roof timbers are exposed and varnished. The interior is fitted up in pitch-pine, with pitch-pine wainscoting and pulpit. The church and schools are heated with hot water on the high-pressure (small bore) system. The builder is Mr. Roberts, Mold; the clerk of works Mr. Roberts, Ruthin. The architect is Mr. T. G. Williams, Liverpool.

We are requested by Mr. Archer to say that he was assisted in the completion of Hyde Park Court, illustrated last week, by his partner, Mr. Francis Hooper, A.R.I.B.A. As to this illustration, we omitted to state that the large spiral staircase, so elaborately detailed in our description of the building, the balcony railing, verandahs, and a portion of other ironwork were all supplied, to special designs, and fixed by Messrs. Steven Bros. and Co., of 4, Upper Thames-street, E.C. The spiral stair in question is 7ft. in diameter, and is the largest of the kind in London, with the exception of the one erected at Messrs. Steven Bros. and Co.'s own showrooms at 4, Upper Thames-street, which is well worth inspection.

On Saturday, the last link in the direct overland communication between England and Gibraltar was completed by the formal opening of the Algeiras-Bobadillo Railway, the final section of which, that between Rhonda and Algeiras, opposite the peninsula of Gibraltar, has now been finished. Mr. James Ffiorde is the engineer of the work, by which the journey from London to Gibraltar has been reduced to sixty hours.

A scheme is being promoted for the construction of a line from Tollesbury, a fishing village at the mouth of the Blackwater, to join the branch of the Great Eastern Railway from Witham to Maldon.

Correspondence.

THE INSTITUTE AND ITS ASSAILANTS AND APOLOGISTS.

To the Editor of the Building News.

SIR,—In a work recently published, "Architecture a Profession or an Art," I find that an address to the Royal Institute of British Architects, which I signed, is placed at the head, as a sort of text for an attack on the Institute.

When I signed this document a serious attempt was being made to obtain legislation for what is termed "closing the profession." The Institute was petitioning the House of Commons against it, and it is a step to which I see very great objection. I signed in all good faith with the Institute, and I think that I might have been consulted before my name was used so as to appear hostile to it.

With regard to the Institute examinations, I feel sure that the healthy stimulus they give to exertion and study is very decidedly advantageous. Before they existed no means were available by which to ascertain whether an applicant for admission had any real qualification for his work. Surely it is a step in the right direction to encourage men to study, and show that they have done so to some effect.

I should be glad to see another step taken, by which the Institute would become a teaching body. For the present, it has taken the line of assisting the ever vigorous Association in the work of education, and perhaps they will work together on broader lines than if they work singly.

There seems to be no reason why the Institute should not assist in the education of designers and artificers of all classes connected with architecture; but that happy time will be more speedily brought about if those who desire it use their influence to promote it, instead of holding aloof, with the apparent object of driving the Institute into narrow ways.—I am, &c.,

Cambridge, Nov. 28. W. M. FAWCETT.

"SEASIDE ARCHITECTS."

SIR,—It would be interesting to learn if the letter under the above heading, in your issue of the 18th inst., is intended to be taken seriously, or as an unwitting sarcasm on the writer himself. Whatever are the ways or customs of "the profession," it is quite evident that "young architect, fresh from a first-class office," has quickly adapted themselves to their modes and manners, as I will prove. In the first place, I may say that I do not object to advertising, but I do detest any posing under a false attitude, or acting the part of a Pharisee; let us have a truthful statement of the honest facts.

As to the merits or demerits of advertising, I will not enter, as in this locality we are compelled, in self defence, to adopt methods which may appear strange to our southern brethren. But the most amusing portion of the letter is the reference to the "sheet of elevations," as the producers of that have only been in practice between twenty and thirty years, and have only acted as the architects for the Manchester Exhibition, Blackpool Tower, and sundry other small jobs. This assumed indignation is even greater than the usual pretence we are accustomed to from young architects; but I will vouch that if that gentleman had erected any buildings worth showing he would have acted just the same, or, probably, gone even further. When I finished perusing the afore-mentioned epistle, I went to view some property now being built under a certain "young architect," expecting to have a treat; but, "ye shades of Pecksniff," what did I see?

More prominent than anything, a huge advertisement—no, I beg pardon, I meant "information" board—with the same letters on it that form your last week's correspondent's name. I suppose we all have a double, and therefore, that must account for the strange coincidence (to put it as mild as possible); but, all the same, I would strongly advise "young architect" to compel the double to destroy the advertisement, as it must be a vile libel, and just the opposite of the sentiments and views of the writer of the oracle afore-named. And it must be the double also (good old double) who put an advertisement—no, I mean "information"—paragraph (you must kindly excuse me, as in this country we call a spade a spade) in the local papers intimating—

well, just the usual thing—not, perhaps, "Plans prepared on the shortest notice, at so much per yard," but the same idea, only arranged in different form and words.

"Young architect" had better be looking up that "double," or it may bring a distinguished name into disgrace, and be the means of blighting the hopes of a first-class office, and of the public saying the "whitewash brush" has been extensively used.

And now about the building I have referred to. When I examined the elevation, I fully coincided with the last paragraph of "young architect's" letter—viz., "as regards the architecture, the less said the better." Perhaps, however, the public taste has not been sufficiently cultivated to appreciate the superior design of the building (especially the windows). By the way, I should be glad to know if it is intended that the joints of the bricks are to be used for ventilators, as they are "very fine and large," and also if it is correct that one person asked, when he saw the window jambs, "if that weren't an old bed-post petrified?" or is it to be a furniture shop, without any sign-board?

I will not trespass any further upon your space, but trust that in the process of "settling down," "young architect" will not be let down too low.—I am, &c.,

HENRY BANKS,
Head Assistant in Another First-class Office
in the North of England.
St. Anne's-on-Sea, Lancs.

RE PROPOSED NEW BATHS FOR CHELSEA.

SIR,—Wishing to compete for these new public baths, I sent the usual fee for the conditions of the competition; but finding that nothing was framed in the conditions to protect the competitors, I am obliged to withdraw from the competition.

The two principal points that I object to are contained in a letter just received from Mr. Henry Wright, the clerk to the commissioners, a copy of which I inclose, and trust that all architects who value their time and self-respect will at once withdraw from the competition.—I am, &c.,

R.

The Commissioners for Public Baths and Wash-houses in the Parish of Chelsea.—171, King's-road, Chelsea, 24th Nov., 1892:—

DEAR SIR,—I am directed by the Commissioners to acknowledge the receipt of your letter of 18th inst., and to inform you that the Commissioners do not intend to appoint an assessor. The Commissioners do not bind themselves to adopt any of the designs.—Yours faithfully,

HENRY WRIGHT,
Clerk to the Commissioners.

To "R."

Since then I have received the following letter from the Secretary:—

The Commissioners for Public Baths and Wash-houses in the Parish of Chelsea.—171, King's-road, Chelsea, 29th Nov., 1892:—

DEAR SIR,—I beg to acknowledge the receipt of your letter of 28th inst., and to return herewith your cheque. I may say that it was the intention of the Commissioners to appoint an assessor, but that being unable to obtain definite information as to the amount of the fee required, the proposal was abandoned.—Yours faithfully,

HENRY WRIGHT,
Clerk to the Commissioners.

To Mr. "R."

New Exchange Buildings have been erected at Newcastle-on-Tyne, and special attention has been paid to the ventilation, which is carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

Major-General Hutchinson, C.B., inspector from the Board of Trade, inspected on Tuesday the new line constructed between Huddersfield and Fartown, via Birkby, giving an alternative route to that part of the borough. The new line is $1\frac{1}{2}$ mile in length, and the new route is along John William-street, St. John's-road, Wheathouse-road, Birkby Hall-road, and Spaines-lane. The steepest gradients on the line are 1 in 12, 1 in 4-23, and 1 in 14-29.

Mr. Yates, coroner, opened an inquest at Crewe on Monday, on the body of Janet Vincent, wife of George Alfred Vincent, architect. The husband stated that on Wednesday last he gave up his house in Ridgway-street, Crewe, with the intention of going to Stockport. On the way to the station his wife was taken ill, and she had some brandy. As the railway officials considered her too ill to travel, they returned into the town, and about midnight both he and his wife were taken to the lock-up by the police. The next morning they were discharged. Dr. Moody was called in the following day, and found the woman dying. In his opinion, death was due to excessive drinking. The coroner severely questioned the husband, and adjourned the inquiry for further witnesses.

Intercommunication.

QUESTIONS.

[1901].—**Colouring Dirty Cement Stucco.**—I wish to colour some old cement stucco to match new. Is there any way of mixing Portland cement to form a permanent wash? If so, please state method.—**BUILDER.**

[1902].—**Measuring Walls.**—A dispute has arisen between an architect and a builder as to the proper way of measuring walls of various thicknesses. In the "quantities" the wall was stated to be so many perches, but nothing was said about the thicknesses or local customs. The walls were of various thicknesses, from 8ft. 6in. to 1ft. 6in. The builder now claims extra on quantities, and says the walls are to be reduced to a uniform thickness of 18in., according to local custom; but the architect will not allow it, and says that all walls must be measured superficially without considering the thickness. Will any reader oblige by giving his opinion as to the proper way.—**SOUTH WALES.**

[1903].—**Washable Distemper.**—Will some one please say how this is made and applied?—**BUILDER.**

[1904].—**Painting Roman Cement.**—Can Roman cement be safely painted sooner than Portland?—**SAP.**

[1905].—**Valuer's License.**—I should be glad to know through some of your correspondents what is my legal position with regard to valuer's or appraiser's license. I am frequently called in to make valuations for mortgages, and have up to a short time ago held such license, but am told that I have no necessity to do so, inasmuch as the valuation is not obligatory between parties. I may say that I have mentioned this matter to the Inland Revenue Officer, and he is not quite clear on it himself. I may also add that I do not have on my office sign the word valuer, but simply architect and surveyor.—**INQUIRER.**

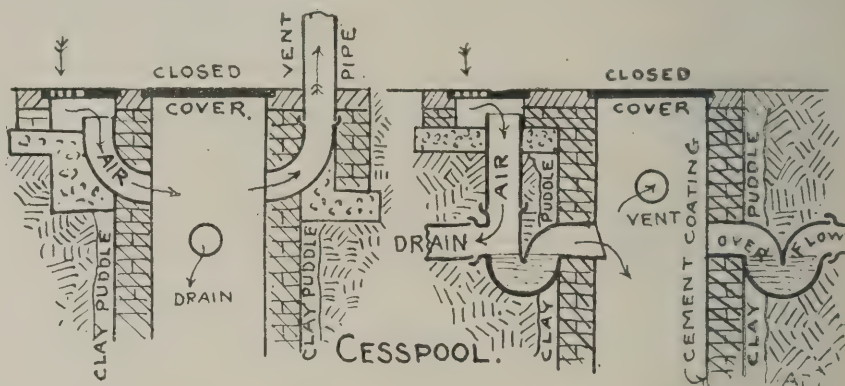
[1906].—**Chemical Burning.**—I shall be glad of some information as to the process of jointing leadwork which goes by the above name. What is the *modus operandi*? What is the acid which is used, and its price? How does the labour compare with soldering as to time occupied? Is the work a speciality—that is, is a workman entitled to anything over ordinary trade-union plumber's wages? Answers to these questions and references to textbooks will be esteemed a favour.—**W. X. Y.**

REPLIES.

[1873].—**Boasting.**—On the 21st Oct. "One Who Wishes to Learn" inquired what was "boasted" work, and on 28th Oct. N. Joyce replied that if he visited a freestone mason's yard he would see a broad chisel inch wide called a "boaster" in which faces and, in good work, beds and joints were finished. On Nov. 14th "One Who does not mind Telling" says "boasted" work means parallel lines about 10 to an inch on the face of the stone, vertical when well done, but if badly done at an acute angle, and that a boaster is a chisel 2in. or 2in. wide. On 11th Nov. "A Mason" really tells what boasting is or was as I knew it years ago when I often stood at the safe side of a banker. "Boasted" may be phonetic or local, but whether right or wrong as to the word, he is right as to the work, which is roughly preparing for a finer finished face. "The One Who Told" in this week's "B.N." takes "Mason" to task for correcting him with a horny hand rather than a kid glove, even if out at the finger-ends, and demands that "authorities" and "rebutting authorities" be quoted. This only shows that he knows more of books than bankers, and of boasting with a pen's point than with a mallet and tool. Still, his reference to authorities is not happy, for those he mentions that I have at hand do not support him. Parker's "Glossary" says "to boast is to block out for carving." "Nicholson" old ed., describes boasting as "paring the stone irregularly with a broad chisel and mallet, and in carving rough-cutting the outline," &c. Gwilt says, "In London the tools used to work the face of a stone are successively the point, the inch tool, the boaster (the operation of working with which is called boasting, as that with the point is called pointing), and the broad tool." This should be sufficient authority for "The One Who Told," who should not only be glad to be corrected by a practical man, but should not raise side issues on orthography, or on large or small areas, or the width of chisels (as to which he confounded a "boaster" with a "broad tool"), or fling authorities at the head of "A Mason," who possibly may be a better authority on the subject than all the authorities mentioned rolled into one. But all this is beside the original query, "What is boasted work," which "A Mason" has answered, and "The One Who has Told" has only proved that he, like Goldsmith's schoolmaster, "even when beaten could argue still."—**M. M.**

[1873].—**Boasting.**—Your correspondents appear to have somehow got very much mixed on this subject, and I will try to help them out of the misunderstanding. It is now some 24 years since I worked as an apprentice stonemason, and the following is what I remember of the subject of inquiry: The process of "boasting" is the last effort of the working mason to finish a straight or even surface on the stone, and is usually done with a tool from 2in. to 3in. wide. No good or sensible mason would endeavour to use a boaster at right angles to the bed of the stone, nor would he on the other hand use it at anything like an angle of 45°. I never saw a specification which said that he should do so. The question of how the word is spelt is, I think, a matter of little moment; but I am sure that "boasting" is the word most in use and best understood by masons generally. I remember one or two masons in my life who always referred to the tool as a "booster," and the use of it as "boosting," and I believe that they hailed from the North Riding of Yorkshire, and probably your correspondent, "A Mason," is of that ilk. The process of tooling, which has so unaccountably become mixed up with boasting, is a different process altogether, and is simply of an ornamental character. The idea seems to have been to make each stone in a building look as if finished by one machine, and as scarcely any two masons could be found to tool exactly alike, it was usual to select one or more masons (according to the size of the building) to tool the exposed surfaces of all the stones worked by the other

masons engaged on the building. The process consisted in making a series of small hollows close together in the face, and always at right angles to the bed of the stone. Each separate hollow was made by one blow of a mallet on the head of a tooler, repeated as many times as would cover the full depth of the stone in hand, thus completing one hollow before commencing the following one. The tooler was usually 4½in. wide, and was made spe-



cially for tooling. It could not be used for any other purpose in masonry on account of its breadth and consequent weight. To insure even work the face of each stone was finished as straight and smooth as possible, and in many instances rubbing (with stone or iron and sand, with water combined) was considered necessary to make an even surface for the tooler to rest upon before being struck with the mallet. Tooling is now little used in this country, except for improving the appearance of the exposed surfaces of tooled flags, landing steps, and street kerb. This is done by men at the quarries in a very rough manner by making marks with a tooler about 2in. or so apart. I should recommend "The One Who Told" to find a mason of the old school who was at work, say, 35 years ago in any of the Yorkshire (West Riding) manufacturing towns, and take him as an authority. I am afraid that the Manchester mason who sampled the boasting must have been like the man who made Chrysores (as Galatea has it) "only a beginner." What I have written refers to sandstones generally, or hard limestones. The working and finishing of soft oolites or freestone is another matter.—**A BUILDER.**

[1873].—**Boasting.**—I have no desire to appear harsh, and perhaps your correspondent is justified in taking exception to the manner of my reply in your issue of Nov. 11th. I think it must have been caused by the title he took. As to his list of books and authorities, these are all very well in their way, but they are not of much use in instructing workmen. I will at once concede him the point of spelling "boasting." I have seen it used both ways, and it does not really affect the issue. I may add that many architects say "boosting," so I suppose I am in good company with regard to it. I maintain that the description of work he gave in your issue of Nov. 4th is "tooling" pure and simple, and an excellent description it is, except as to tool used for doing it. Boasted work is very different, and is nearly always done to an angle, and varies with the texture of the stone as the number of blows to the inch. A "tooler" is a tool 4in. to 5in. wide, and a "boaster" is 2in. to 2½in. I never said that a "boaster" was 4in. wide: the vertical lines or blows in tooling are usually done after the work is boasted. Sometimes on very excellent work it is rubbed before tooling. I may say that tooling is really done more as ornament, and requires to be done fine, whilst boasting is really a levelling of the surface, and the boaster often takes 1-16in. or so of the surface of the stone, thus in a manner dressing it. I think your correspondent cannot have read my answer very carefully, or he would not ask for an authority showing a boaster to be 4in. wide. This is a tooler, and is the one used to produce the kind of work he describes as boasting. I think that a discussion on paper on technical subjects is nearly always unsatisfactory, and would suggest that he takes the correspondence as it stands, and submit to the judgment of the Manchester district. As he appears to hail from the Manchester district, I would have no objection to meeting him, and to this end I enclose full particulars with the object of a friendly conversation on the matter. This is my last communication on paper. I am quite willing to abide by the judgment of the trade. As to custom in the North and Midlands, there may be some exceptions. I spoke generally.—**A MASON.**

[1886].—**Breaking Weight.**—In the multitude of counsellors there is wisdom, and two heads are better than one; but "Student" will hardly be able to perceive which of the three answers to his query is the correct one, therefore I step in as arbiter. "Essex" and "Sien Seng" have omitted to notice that the column comes under the denomination of short, and have not made the consequent correction. The answer given by Mr. R. J. Angel is the correct answer by this formula—viz. $BW = 116 \text{ tons or } 116 \text{ tons safe load}$, taking the crushing weight of red deal at 3 tons. This weight, however, is rather more than Mr. Hodgkinson obtained by experiment, his figure being 5,748lb. (see Stoney on "Strains," art. 30). Taking this as a low result, we have a safe load of 10½ tons on the pillar. "Student" will find an example worked out in Stoney (art. 337), and checked by Rondelet's and Brereton's rules. I have worked out the above by one of Gordon's formulae, and the result is 10½ tons safe load. I may point out that Mr. R. J. Angel has left out a constituent of "C," which is crushing strength of the material per square inch \times sectional area of column (see Moresworth, 21st edition, p. 112). This was probably a clerical omission, as he works out the formula correctly. To obtain the diameter of a short column when the height and load are given, it is not possible to invert the formula given by "Student,"

because that needs correction. He must adopt "Sien Seng's" suggestion: assume a section, and calculate what it will bear until the right one is found. With regard to the girder formula, the one given is correct for a uniform distributed load and fixed ends. Occasionally one-sixth of the web is included in the bottom flange, but more generally it is omitted. On this question see Stoney on "Strains" (arts. 78, 100).—**DEPUTY B.E.**

[1888].—**House Drainage.**—The cesspool should certainly be ventilated, otherwise the carbon dioxide, sulphuretted hydrogen, or whatever form the sewer-gas may take, will, owing to their expansive properties, force the very best trap ever constructed. Moreover, if the cesspool is kept hermetically sealed for the period stated by your querist, carburetted hydrogen will be formed, owing to the decomposing matter, which gas is highly explosive if a light be applied. The ventilation of the cesspool should, however, be kept entirely separate from that of the drain. The 89th section of the Model By-laws requires "that each cesspool shall be provided with adequate means of ventilation." I enclose a sketch.—**R. J. ANGEL, Town Hall, Birkenhead.**

[1898].—**House Drainage.**—In all cases in sanitary systems it is essential to guard against any accumulation of gases by efficient ventilation. In the case in point, the circumstance of the cesspool being charged with gas would be a source of danger. Should the generation of gas reach such limits as to cause a pressure greater than that of the atmosphere, the trap would undoubtedly be forced, and even if the pressure did not reach such a point the water in the trap, especially if not frequently changed, would pass the gas through. The cesspool should most certainly be ventilated. I shall be pleased to give any further information on the subject.—**HARRY G. ASSITER.**

[1893].—**Floor Boarding—To Drive away Rats and Ants.**—In the trade 1½ flooring would be 1½in., 1 flooring would be 1½in., from the fact that 9in. deals and 2½in. battens, &c., lose a portion of their thickness in sawing and planing. Replying to "Subscriber" re rats, an infallible remedy is chloride of lime, as they flee from its odour as from a pestilence. Replying to "Bothered," to drive away red ants, place sprigs of ground-ivy where they are found.—**R. LOWE.**

[1899].—**Damp Walls.**—The best remedy for damp walls is to coat them with the patent solution, composed of silicate of soda and chloride of calcium in separate washes.—**R. J. ANGEL, Birkenhead.**

[1900].—**Stoneware Pipes.**—Stoneware and earthenware pipes are not made from the same clays. The clays from the Lias formation are mixed with powdered and calcined flint, and burnt in domed kilns. This produces stoneware. Earthenware articles are made from ordinary clays. Both are glazed in the same way with chloride of sodium.—**R. J. ANGEL, Birkenhead.**

CHIPS.

Mr. J. Passmore Edwards has, through Mr. W. C. Plant, chief librarian and clerk, handed over to the Shoreditch Library Commissioners the sum of £4,250, being the amount paid by them for the purchase of the library buildings, librarian's house, and a large plot of ground adjoining. By this munificence, and a further grant resolved upon last week by the City Parochial Foundation of the sum of £250, the Commissioners will be enabled to have two libraries instead of one for the densely-populated parish of St. Leonard's, Shoreditch.

Additions have recently been made to Redhill Cottage, Chislehurst, for Mr. C. C. Chapman, consisting of new servants' offices and outhouses, and additional sitting-room and bedrooms. The drainage and sanitary arrangements have also been entirely reconstructed. The work has been carried out by Mr. F. Wood, of Chislehurst, from the designs and under the direction of the architect, Mr. John Rawlinson, A.R.I.B.A., London.

The technical school committee of the Birmingham corporation have recommended to that body the acquisition of a freehold site for the proposed Central Technical School with a frontage in Suffolk-street, and extending rearwards to Summer-street, which can be purchased for £12,000. The land has an area of 2,762 square yards.

Good progress is being made with the building of the new technical schools at Aston. Mr. George H. Cox, of Birmingham, whose design was selected in competition in February last, is the architect, and Mr. F. N. Stephens, of that city, is the builder.

Legal.

SURRENDER OF TENANCY.

THE surrender of a lease should be by a deed in which the lessor accepts that surrender, and so the lease is properly and legally determined. But there can also be a surrender or determination of a lease or tenancy by operation of law, based upon the mutual consent of the parties, as shown by their acts. This frequently occurs when a tenant, desiring to get rid of a house for some reason or other, takes the key to his landlord. But, of course, this alone is not enough, and unless the landlord either expressly or impliedly accepts possession by keeping or using the key, there is no determination of the tenancy. The mere fact of a lessor or landlord allowing the key to remain in his possession will not of itself be conclusive, but if the landlord avails himself of the key to go into the house and repair it, or puts up a bill to let it, that will amount to such evidence of an intention on his part to determine the tenancy as to be practically conclusive against him.

In the recent case of "Smith v. Roberts" (*Times*, 17th November), these principles were applied to a curious state of facts. It appeared that the defendant was tenant of the upper rooms of a house in London for a term of five years from 1889. In 1890 notice was served on the defendant to repair a wall that was bulged, as being dangerous. This was sent to the plaintiff as owner. Ultimately a magistrate's order was made to do the work, and the plaintiff applied to the defendant for permission to send his men upon the premises for this purpose. The tenant answered that he could not prevent it, but would not consent, and should treat it as a disturbance, and he removed his furniture, and withdrew from possession, sending the key to the plaintiff, and stating that he determined the tenancy. The landlord replied, refusing to accept such a surrender of the holding, but he retained the key, sent his men to do the work ordered, did other repairs, and then offered the key back again. He now sued for a quarter's rent, as if the tenancy was still existing. The Judge who tried the case found for the defendant, and the Court of Appeal have just confirmed this ruling. They did this upon the conduct of the parties, and especially upon the facts that the plaintiff had really rendered the house uninhabitable, and had acted as if he agreed to determine the tenancy.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by *Tuesday* morning to insure answer same week.

X. Y.—BUILDER.—EXTRAS.—CLAIM.—The builder can only claim for such extras as were authorised by the architect under the contract. But as the account of the building does not appear to be closed, his claim should be gone into, and settled upon this basis. If necessary the work so charged for should be measured up by the architect.

W.—BUILDER.—ARCHITECT.—PENALTIES.—The architect should prepare final certificate in the usual way when the works are quite completed, drawing the building owner's attention to the delay and the penalties incurred under the contract, and leaving him to enforce them if he thinks proper.

LEGAL INTELLIGENCE.

THE BUILDERS AND THE FLORIST.—Messrs. J. W. Wyatt and B. Corber, builders, sued W. G. Hodge, florist, of Plymouth, at the Devonport County Court last week for £20 balance due for work done. The plaintiffs contracted to erect two greenhouses at Crown Hill in April last for £184, and in accordance with a stipulation the contracts were mulcted of £20 for four weeks which they were delayed after the arranged date of completion. The action arose out of the allegations that defendant delayed them a week in starting operations, and the further hindrance was occasioned by Mr. Hodge entering into a separate contract with a Mr. Wyatt to do some work to the houses. Defendant denied these pleas, and affirmed that he had to throw away £30 worth of cucumber plants in consequence of the non-completion of the works. His Honour reserved judgment.

UNFENCED MACHINERY.—Messrs. Wm. Thomas and Co., builders, of Cardiff and Pontypridd, were summoned at the Pontypridd Police-court on November 23rd by Mr. Augustus Lewis, H.M. Inspector of factories, for having neglected to properly fence a flywheel upon their works at Pontypridd. Mr. Thomas said that, owing to a

change of foremen, his attention was never called to the matter until the 1st of November, when the fencing was at once put up. The defendant was ordered to pay the costs of the case.—A similar charge was preferred against Mr. John Henry James, builder, Berw-road, Pontypridd, at whose works a boy had been killed. Defendant was fined £1 and costs.

RE J. G. ROGERS.—This case, that of a builder, of Timpson-road, Landport, and formerly a member of the Portsmouth Town Council, had been adjourned for the production of a trading account. The Official Receiver said, at the hearing on the 19th Nov., the accounts submitted to him were unsatisfactory. They were inaccurate, and made on a wrong basis; but if taken as they stood, the accounts showed a deficiency of £2,000, instead of a surplus of £4,000. Under those circumstances, he must ask for amended accounts, and should adjourn the case until Dec. 19.

IN RE GEORGE NEWMAN AND CO. (LIMITED).—Mr. Buckley, Q.C., appeared before Mr. Justice Wilkins, on Friday, on behalf of Mr. C. J. Steward, official receiver and provisional liquidator of the London and General Bank (Limited), (now in liquidation), in support of a petition by the bank, as creditors, in respect of about £90,000, for a compulsory winding-up order. The company were builders and contractors, and had been brought down by the fall of the Liberator Building Society. No opposition was offered, and the Judge made the usual winding-up order.

CONVICTION OF A BANKRUPT BUILDER.—Frederick Banyard, better known in Sussex as Frederick Stevens, builder and contractor, of East Grinstead, surrendered to his bail at the Central Criminal Court, on Friday, on a charge of removing and concealing large quantities of property belonging to the trustees of his bankruptcy when a member of the firm of Pearse and Banyard, at Kensal-green, in April, 1892. The prisoner failed again recently at East Grinstead, in connection with the collapse of Head's Bank, and his examination in connection with this affair led to his identification as Banyard, and to the disclosure of the facts of the proceedings of more than ten years ago. The jury returned a verdict of guilty, and prisoner was sentenced to two months' imprisonment.

AN ARBITRATOR'S AWARD UPHOLD.—In the Chancery Division on Tuesday Mr. Justice Romer heard arguments in a dispute between the Conservators of the Thames and the London, Tilbury, and Southend Railway Company. When the Railway Company required land for a station at Thames Haven, in the parish of Fobbing, Mr. Littler, Q.C., was chosen arbitrator, to decide the amount to be paid to the Conservators, and in December, 1890, he awarded £2,158. The Railway Company endeavoured to set aside this award, on the ground that it was made upon a wrong basis—that of the Thames Conservancy Acts in lieu of the Lands Clauses Consolidation Act. But the Judge held that it could not be impeached, and decreed specific performance.

THE MODEL WINDMILL SKY-SIGN CASE.—The London County Council and Messrs. Carwardine and Co. appeared at the Worship-street Police-court on Wednesday last for a readjudication of a summons taken out by the Council against Messrs. Carwardine for keeping and maintaining a certain erection over and above their premises—viz., a model windmill—the same being a sky-sign within the meaning of the Act. The whole question was argued before this Court last spring, when Mr. Rose dismissed the summons, deciding that the structure was not within the Act. On appeal by the Council, however, to the High Court, the case was ordered to be reconsidered by the magistrate, and hence the reappearance of the parties. It was now said that the letters had been removed, and the advertisement painted out. Whether the erection was to be demolished is to be a matter for further argument, Mr. Burton applying for further summonses against Messrs. Carwardine. Mr. Rose imposed a fine of 20s., no costs being allowed.

AN ARCHITECT CONVICTED OF ASSAULT.—On Saturday, at the Dorking Bench, William J. Shearburn, architect and surveyor, Dorking, was summoned for assaulting and beating Arthur Reigate. Complainant, a butcher, struck the defendant's dog for chasing sheep he was driving, whereupon defendant snatched the stick away and gave the complainant three or four sharp blows. He was ordered to pay a fine of £3 and costs, 14s. 6d.

ARBITRATION AS TO MAIN ROAD MAINTENANCE.—Mr. Thomas Codrington, C.E., an inspector of the Local Government Board, attended at the Municipal Offices, Burton-on-Trent, the other day, for the purpose of arbitrating upon the difference which had arisen between the Burton Town Council and the Staffordshire County Council as to the amount of expenses which should be paid by the County Council for the repair of the main roads for the year which ended March, 1890. The County Council had paid £1,500 on account, and the question was to what extent they ought to be called upon to contribute towards the watering, scavenging, and repair of the main roads, which,

in fact, are the old turnpike roads. The Town Council called as witnesses the borough surveyor (Mr. Swindlehurst), Mr. Hooley (county surveyor of Nottinghamshire), Mr. Eayrs (surveyor of West Bromwich), and Mr. Harley (who formerly had the management of the Staffordshire roads). On the other side the only witness called was Mr. Moncur (chief road surveyor to the County Council). After a full investigation, the case terminated, and Mr. Codrington will make his report to the Local Government Board.

INFRINGEMENT OF BY-LAWS.—At the Wallasey petty sessions on the 16th ult., George Robinson, builder, Massey Park, Liscard, was summoned by the Wallasey Local Board for having contravened the building by-laws by erecting a house more than two stories high, the walls of which were less than 14in. thick. For the prosecution it was stated that the plans indicated a building of two stories; but the manner in which it was built made it one of three stories, what was originally intended for a bathroom having been made into a bedroom. Evidence was given by Mr. Salmon, surveyor to the board, and the Bench imposed a penalty of 40s. and 11s. 6d. costs.

IN RE W. R. PARKER, CARDIFF.—The first meeting of the creditors of Mr. Councillor W. R. Parker, contractor, of Station Approach, Cardiff, and Marine Parade, Penarth, was held at the office of the Official Receiver in Bankruptcy on Thursday in last week. In regard to the estate of W. R. Parker and Co., the statement showed unsecured liabilities, £7,994 3s. 2d.; partially secured creditors expected to rank against them £2,351 14s. 9d.; making the total liabilities to £10,345 17s. 11d. The assets, after deducting for preferential creditors, were £3,536 10s. 6d. and left a deficiency of £4,979 6s. 4d. The surplus, after payment of the personal estate, will go to the credit of the preferential claims under the partnership estate. With regard to Mr. Pedrette, there was a deficiency of £1,132 14s. 11d., and the liabilities amounted to £1,700. The debtors offer a composition of 7s. 6d. in the pound, payable as follows:—4s. within six months hence, and 3s. 6d. within twelve months. No security was offered. Several creditors thought an offer of 10s. should have been made, and after much discussion the meeting was adjourned to enable him to submit a fully-secured offer of composition.

RE A. E. WARD.—Alfred Ernest Ward, of Eccles New-road, Weaste, builder, underwent his public examination at the Salford Bankruptcy Court on Monday. The bankrupt's statement of affairs showed liabilities to unsecured creditors £1,098, and contingent or other liabilities £40, making a total of £1,138, and assets nil. The bankrupt alleged as the cause of his failure "transferring his property to another person, who promised that all debts should be paid; also contracting debts for other parts of a speculation into which he had entered, being all the while promised that everything should be paid." In January, 1891, the bankrupt, with three other persons, embarked in a building speculation, and became joint purchasers of 28 houses, and 11,000 or 12,000 yards of land at Weaste. In July, 1891, bankrupt and the other parties to the speculation dissolved partnership, and he took over the property and the liability. All his present liabilities, he said, arose out of the partnership. The examination was adjourned to the 19th December, the bankrupt being directed to furnish amended accounts.

CURIOUS ACTION BY AN ARCHITECT-AND-CONTRACTOR.—At the Llandudno County-court last week, Edwin Turner, architect, sued William McGrath, of Llandudno, and late of Birmingham, for £25 for professional services. The plaintiff, it was stated, had been an architect in Llandudno for the past 20 years, and the defendant was a stranger who had come into Llandudno some time ago and built a house, which he did not like. He saw plaintiff, who showed him over the house of Mr. T. T. Marks, the former surveyor to the local authority, and defendant agreed to the building of a house of the kind with certain modifications. He then instructed Mr. Turner to draw out plans and specifications. These plans were submitted on two or three occasions, and there was some conversation about cutting down the expenses. Mr. Turner then offered to build the house for £1,300. This was agreed to, and Mr. Turner communicated with a Robert Roberts to sublet him the masonry. The sum of £80 had been set aside for chimneys and mantelpieces. The plaintiff said he would have the grates and mantelpieces from the wholesale house he dealt with, because he had based his estimate for the work upon the idea that he would get the little profit of the trade by way of discount. The defendant said "Oh! those grates will be supplied from my own firm in Manchester. I am entitled to the discount." Mr. Turner insisted upon having the discount. Thereupon the defendant left, and they did not have any transaction together after that. The plaintiff was called and confirmed counsel's opening statement. First of all, the cost was not to exceed £1,250, and

£60 was set for grates and chimneys. Ultimately the defendant got another person to finish the house, which had cost him double the money. Cross-examined, witness said he had Mr. Marks' house in his mind as being one which would be suitable for Mr. McGrath. Witness sold the house to Mr. Marks for £1,300, and he supposed it cost a little less than that to build. Witness said that at first he was architect, and after a time he became contractor, having told defendant he would build the house. If he had gone on with the contract he would simply get £1,300, and on that he would have had his profit. His Honour said the question was, whether the position of architect at first occupied by the plaintiff became merged in the contractor. He was an architect at first, but elected to become a contractor, and he could not go back to his old position. Mr. T. T. Marks, C.E., was called and asked what was the custom regarding the purchase of grates and mantel-pieces for new houses. The witness said he had never been in that position, and therefore could not answer. If he was a contractor, he would try to get the purchase of the articles so as to have the discount, but as an architect he would have nothing to do with it. His Honour: If the plaintiff had stuck to the original rôle of architect, he would have been entitled to his fee. Mr. Porter argued that the plaintiff made no plans, and that they were simply copies of those of Mr. Marks' house. Wm. McGrath, the defendant, spoke as to the negotiations which took place between him and the plaintiff, who volunteered to build him a house. He looked upon Mr. Turner as a contractor pure and simple. The house had been built from other plans, and placed in a different position on the field. His Honour said it was evident that the plaintiff started as architect, but when he undertook to build the house, from that moment he became the contractor. It was practically giving up his right as architect, and then he could not come on as before. Whether he was contractor from the first, or became contractor afterwards, the original position of architect had been broken, and undoubtedly he could not hark back into the position of pure architect. Mr. Turner's character as contractor predominated over that of architect. There would be judgment for the defendant.

EXEMPTIONS UNDER THE BUILDING ACT.—The secretary of the Regents' Canal and Railway Company was summoned before Mr. Horace Smith at Clerkenwell under the Dangerous Structures clauses of the Building Act, 18 and 19 Victoria cap. 122. The solicitor to the London County Council called Mr. Henry Lovegrove, district surveyor, to prove his certificate as to the condition of an ancient timber building in Graham-street, City-road, and, after hearing arguments by a solicitor on behalf of the company, decided that the Canal Company was not exempted by the third section of the Act, and the case was adjourned for 28 days to give time for the removal of the building. Another summons was then heard, taken out by Mr. H. Lovegrove, against the Canal Company, for erecting a building without giving notice. The district surveyor stated that the building in question was occupied by a firm of woodchoppers, and was not only erected without notice, but was irregular. The magistrate decided that the exemption clause did not apply, and fined the company £1, with costs £1 3s. The solicitor to the Canal Company asked the magistrate to state a case.

A new Masonic Hall at Moffat, N.B., was opened last week. It is plain Grecian in style, and has been reconstructed from plans by Mr. F. I. G. Carruthers, P.G. Architect of Dumfriesshire.

St. Luke's parish church, Prestonville, Brighton, is being heated by a hot-water system (low-pressure). The contractor is Mr. John F. Phillips, of Richmond-buildings, Brighton. The work is being superintended by Mr. C. E. Hewitt, surveyor, of Prestonville, Brighton. In removing the old furnace, it was found that a part of a 6in. iron flue-pipe, about 18in. in length, was completely destroyed, and that the floor above (which is a wooden one covered with tiles) was considerably charred. The wonder is that no fire took place, as the naked pipe was only about 1ft. from the joists. An iron church on the same site was burned down about the year 1870.

A very large Cambridge-quarter clock, showing the time on four external mosaic dials, 11ft. each in diameter, and striking the hours and quarters upon five bells of the total weight of 5 tons 1qr. 10lb., with dropping arrangement, and Lord Grimthorpe's double, three-legged gravity escapement, 1½sec. compensation pendulum, with cylindrical-shape bob weighing 450lb., and all the latest improvements, has been presented to the city of Liverpool, and fixed in the Jubilee tower of the Liverpool University College, and was set going by the donor on the 15th November. The clock also drives three large dials inside the building by an electrical arrangement attached to the clock movement, and the whole were supplied and fixed by Wm. Potts and Sons, of Leeds.

WATER SUPPLY AND SANITARY MATTERS.

BRUTON WATER SUPPLY.—The Wincanton Rural Sanitary Authority have had under their consideration a scheme by Mr. A. P. J. Cotterell, A.M.I.C.E., of Bristol, for the supply of water to the town of Bruton, Somerset, and, after consideration, have given instructions to proceed with the necessary plans. The water will be obtained from two springs, one of which will supply the eastern, and the other the western portion of the town. Both springs come from the lower oolitic formation. Covered service reservoirs will be placed near the springs, and the water will gravitate thence into cast-iron distribution mains to all portions of the town. The eastern and western service pipes will be connected so as to increase the pressure in the western portion in case of fire.

EVESHAM SEWAGE WORKS.—A Local Government inquiry was held on the 11th ult. at the Town Hall, Evesham, by Mr. Herbert Tulloch, A.M.Inst.C.E., for sanction to raise a loan for sewage purification purposes. The Mayor and several leading members were in attendance, and Mr. R. Mawson, C.E., borough engineer, stated that the council had decided to adopt the International system of ferrocene and polarize in order to prevent pollution of the Stratford Avon. Mr. F. Candy, of Westminster, gave technical evidence as to the system to be used. There was no opposition, and it is probable that the works will be carried out without delay.

KEYNSHAM, SOMERSET.—The Keynsham Rural Sanitary Authority have instructed Mr. A. P. J. Cotterell, C.E., of Bristol, to prepare a scheme for the sewerage and sewage disposal of the town of Keynsham, near Bristol.

TORQUAY.—Torquay has admittedly one of the best water supplies of any town in England, both for quality and quantity. Yet it has been awkward for St. Raphael's Convalescent Home, which being two miles distant from the local storage reservoir, and practically on the same level, great inconvenience has been experienced thereby. The lady superior, very soon after taking up her abode as superintendent, had a scheme submitted to her, whereby she could do away with the very objectionable lift pumps, &c. To form a storage a large cast-iron tank, the capacity of which is 12,000 gallons, has been erected upon a unique two-story brick building, and resting upon steel joists, at such height so as to gravitate over the whole of the vast premises, which occupy some 16 or 18 acres. To supply the tank a 3in. cast-iron pipe, coated with Angus Smith's solution, is carried away through the streets to about a mile and a half distant and connected with a stand-pipe, which has its supply direct from the large Totteford reservoir eighteen miles away. The work has been carried out by the firm of William A. Gass, Torquay, engineer and contractor; Mr. C. E. Robinson, who has constructed several cliff lifts, being the consulting engineer.

POLLUTION OF THE YEO.—The Wincanton Rural Sanitary Authority have been threatened with an action for alleged pollution of the Yeo near its source by the discharge of sewage from the town of Milborne Port without proper treatment, called in Mr. A. P. J. Cotterell, C.E., of Bristol, to advise them upon a better system of disposal. His report was considered by a vestry meeting at Milborne Port, and was unanimously passed, and having since received the approval of the sanitary authority, instructions have been given to proceed. The sewage will be treated with ferrocene just before reaching the existing outfall tanks, whence, after deposit, the effluent will be carried in pipes to the Henover Meadows. Here 16 acres of ground will be prepared for irrigation, the ground being deep ploughed, and the surface formed into panes, or divisions, for intermittent filtration, and the purified water will thence be conveyed to the stream.

The Runcorn Board of Improvement Commissioners decided on Monday to build public baths for the town. It is proposed to erect the baths on land adjoining the town hall in Waterloo-road, and at the rear of the projected Technical Institute; and the plans drawn by Mr. Barker, the board's surveyor, show a building having a plunge bath about 60ft. long, and six private baths. Northwich Baths have been taken as a model, and the estimated cost is £3,000.

Mr. Justice Wills gave judgment on Saturday in an action brought by the Gas Light and Coke Company against the Metropolitan Railway Company, to test the right of the former to cut through the piers which support the railway bridges in order to lay their mains. An agreement was come to between the parties seven years ago under which this was allowed; but the railway company now desired this agreement to be rescinded, alleging that it was entered into by mistake. This, however, the Judge refused to do; but on other points gave decision in favour of the railway company.

Our Office Table.

A new school for the study of the civilisation of Ancient Egypt is being provided for London from the bequest of the late Miss Amelia Edwards, the well-known Egyptologist, who founded by her will a Chair of Egyptology in University College, the first endowment of the kind in this country. The council of the college have appointed Mr. W. M. Flinders Petrie to be the first Edwards Professor, and he will commence work early in the new year. The appliances for study will include a library complete in works of reference for the History, Language, and Antiquities of Egypt, and upwards of a thousand photographs of monuments, with paper impressions of inscriptions. In addition to the typical collection of Egyptian antiquities bequeathed to the college by Miss Edwards, Professor Petrie hopes to obtain the temporary loan of some valuable private collections. The scheme of operations is:—(1) Lectures on current discoveries, on history, and on the systematic study of Egyptian antiquities. (2) Lessons on the language and philology of Egypt. (3) Attendance in the library on fixed days for the assistance and direction of students working there. (4) Practical training on excavations in Egypt.

The total number of private Bills to be introduced in the House of Commons next session relating to or affecting England and Wales is 152. Of this number 41 are promoted by corporations, county councils, and other public bodies. Fifty-nine Bills relate to docks and railways and 20 gas and water undertakings, and of the remaining 32 some relate to tramways, piers, harbours, canals, bridges, electric lighting, and others are Bills promoted by companies for power to amend their articles of association. Of the total number of Bills 23 relate directly to or will contain powers affecting London, of which number the London County Council are responsible for five Bills of an important character.

An American contemporary, the *Engineering News*, gives a simplified formula to ascertain the safe load for bearing piles implanted in soft soil, where the pile never refuses to go further so long as the blows are continuous. The proposed formula consists in the equation $L = \frac{2wh}{s+1}$, in which

L is the safe load, w the weight of the hammer, h the fall of the hammer in feet, and s the "set," or small sinking of the pile at the last blow. L will be expressed in the same terms, whether tons, pounds, or kilograms, as w .

The Vicar of Arundel appeals for £1,000 for re-roofing the nave of his fine parish church. The circumstances are unusual. Most of the present roof was erected some eighteen years ago during the restoration by the late Sir Gilbert Scott, and according to the report of Sir Arthur Blomfield, there are no faulty timbers, or want of proper ventilation, the mischief solely arising from the ravages of the grub known as *Anobium tessellatum*, which bored its way from the old wood to the new portions then inserted. The only remedy is to strip the whole roof and examine every beam and board. The roof must therefore be overhauled and reconstructed without delay, and regardless of cost, as there are obvious risks lest the grubs should find their way into the seats and other woodwork of the church, and as the venerable Bishop of Chichester observes in his commendation of the appeal: "The peculiar circumstances of Arundel greatly increase the difficulty of obtaining the necessary funds for this indispensable work."

At Carpenters' Hall, London-wall, Professor Banister Fletcher, F.R.I.B.A., M.S.A., delivered a lecture on Friday on "Sanitary Building Construction." Health, he pointed out, was of the first importance if we were to enjoy life and happiness. And to secure health we must live in good houses. At the very outset, it would be well to avoid faddists who were in the habit of stating that, unless the latest approved article were used, houses could not be in a sanitary condition. This, of course, was simply fadism. At the same time, it was always necessary to have approved materials. Beginning at the foundation, Professor Banister Fletcher went on to remark that the best soil was gravel. When houses were put up on mere dust, composed of oyster shells, &c., dry rot would soon be visible

the building. The foundation, which was of the utmost importance, was next dwelt upon at great length. The site was then touched upon, the speaker, in conclusion, referring to the various matters to be borne in mind in connection with the erection of a thoroughly sanitary building.

THE Highgate Museum of Sanitary Appliances will be opened by the Lord Mayor of London on the 8th December. This museum contains a valuable and instructive collection of modern sanitary appliances. It has been established by the Hornsey local board, who, some two years ago, conceived the idea of bringing together a few specimens of the most improved fittings for the guidance of builders and others engaged in their district. With this object in view, a room with floor-space of 940ft. super. was erected, and manufacturers were invited to submit specimens of their sanitary goods. In order, however, to ensure the permanency of the museum, it was stipulated that all articles deposited should become the property of the board. The advertising element has been most carefully excluded. The principal manufacturers responded to the invitation, and it soon became necessary to provide more accommodation. The museum now consists of seven rooms, having a total floor-space of 4,900ft., and there are upwards of 1,000 exhibits. Accommodation has been provided for the instruction of plumbers, and in conjunction with the Worshipful Company of Plumbers and the Middlesex County Council, the board are making arrangements for holding classes in plumbing under the direction of skilled teachers. It is also intended to inaugurate courses of instruction in sanitary science—a rudimentary course for women, and a more practical course for builders, artisans, and others.

THE annual report of the borough surveyor for Walsall states that plans for 572 new buildings were approved in the year, as against totals of 199, 591, and 546 in the three previous years. Among the public works and improvements carried out are the erection of a public mortuary at Wolverhampton-street wharf, alterations and additions to the wharf, the laying down of the equipment for the electric tramways, and the erection of a generating station, the completion of the Free Library and Art Gallery, an improvement in the building lines of the Square and Digbeth, a part of the site of the old Woolpack Inn having been taken in; the purchase of a considerable part of the land required for the new cemetery at Coalpool, the addition of a strip of land to the road in Sandwell-street, and improvement at the corner of Pleck-road and Wolverhampton-road, the addition of piece of land to the road in Profit-street, and the widening of the road, the widening and remaking of Windmill-lane, and the straightening and widening of the mill stream between Tasker-street and Corporation-street. The Arboretum was extended and laid out, and at Reed's Wood much levelling was done as relief works.

AN Arts and Crafts Exhibition, containing an interesting collection of useful and ornamental articles of manufacture, has been opened in York-street Skating Rink, Sydney, under the auspices of the Sydney Architectural Association. It was opened by the Governor of New South Wales on the 2nd Nov., when the annual conversation of the association was given by Mr. Hurst Seager, the President, and the committee. Architectural drawings by Sydney, Melbourne, and Brisbane architects were hung, and the city board of water supply and sewerage made a display of sanitary appliances, while examples of gas and electric lighting and fitting, wood-carving, and many building appliances were on view. The exhibition was a novelty in Australia, and has been very successful.

AN election of one male pensioner on the funds of the Builders' Benevolent Institution was held at the offices, 35, Southampton-row, Bloomsbury-square, on the 24th ult. The result of the polling was as follows: Joseph Lestock Mould, aged 70, of 60, Muriel-street, Islington, builder (second application), 697 votes; John George Bishop, aged 65, of 21, Spencer-square, Ramsgate, builder (first application), 2,272 votes, including 250 votes in respect of his subscriptions to the institution. The successful candidate was, therefore, declared to be John George Bishop. The votes given to the female applicants were as follows: Sarah Elizabeth Drake, aged 60, Tilers' and Bricklayers' Almshouses, King Henry's-walk,

Balls Pond, widow of Francis Drake, late of Acton, builder (fourth application), 2,383 votes; Susanna Mansell, aged 68, of 20, Bridge-road, Hammersmith, widow of William Mansell, late of Hammersmith, builder (third application), 2,484 votes; and Mary Ann Healing, aged 62, of Curtain-road, Shoreditch, widow of Samuel Thomas Healing, late of Spitalfields, builder (second application), 189 votes.

A SPECIAL general meeting of the Builders' Clerks' Benevolent Institution, convened by advertisement, was held on Tuesday evening, November 29, at the offices, 21, New Bridge-street, E.C., for the purpose of electing a pensioner on the relief fund. Mr. Colin G. Patrick, who presided, gave some particulars of the case, after which the applicant, Mrs. S. M. Enright, was duly elected by show of hands, being the only candidate. Mrs. Enright is the thirty-fifth pensioner elected since the foundation of the Institution.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. "Some Problems of Town and City Developments," by Wm. C. Street. 8 p.m.
Surveyors' Institution. 8 p.m.
Society of Arts. Cantor Lecture No. III., "Generation of Light from Coal-Gas," by Prof. Vivian Lewes. 8 p.m.
Liverpool Architectural Society. "Bricks and Brickwork," by John Slater, B.A., F.R.I.B.A. 6.30 p.m.
Leeds and Yorkshire Architectural Society. "Vaulting," by A. Keen. 7.30 p.m.
TUESDAY.—Institution of Civil Engineers. Discussion on "The Manufacture of Small Arms." 8 p.m.
WEDNESDAY.—Society of Arts. "The Chicago Exhibition," by James Dredge. 8 p.m.
FRIDAY.—A.A. Lyric Club. Concert at the Mona Hotel, Henrietta-street, Covent Garden. 8 p.m.

The Architectural Association.—December 2nd. Third Ordinary General Meeting to-night (Friday) at 7.30 p.m. Paper by John Brett, Esq., A.E.A., on "Daylight in the Dwelling-House."

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CHIPS.

A bronze cast of Mrs. Guild's portrait bust of Mr. G. F. Watts, R.A., has been given by Mr. William Agnew to the Whitworth Institute at Manchester.

St. Simon's Church, Bethnal Green, has just been reopened after repair and restoration. Messrs. W. Rhind and Son, of Fulham-road, S.W., carried out the work.

The peal of eight bells in the parish church of Bury, Lancs, has been re-rung, after having been hung afresh, re-tuned, and in two cases recast. Messrs. Taylor and Co., of Loughborough, carried out the works.

The name of Mr. George Owen, of Oswestry, engineer of the Cambrian railways, has been placed upon the Commission of the Peace for the county of Salop.

On Wednesday a reredos, entirely of alabaster, designed by Mr. E. J. Tait, architect, of Exeter, was dedicated in the church of Bratton St. Mary, near Clovelly.

The directors of the London, Tilbury, and Southend Railway intend to finish the new line from Tilbury Docks to Romford by June next.

The foundation-stone of Kirkwall Free Church was laid on Monday by Mr. Stephen Muir, the oldest member of the session. The church, which is to accommodate 600 sitters, is estimated to cost £1,800.

The Special Committee of the Sheffield Town Council appointed to carry out a resolution recently come to for the widening of High-street, the main thoroughfare of the town, at an estimated cost of £263,000, have negotiated agreements for the purchase of nine out of eighteen properties required. These agreements will enable a commencement to be made with one of the most important street improvements in the history of Sheffield. The new street will be 80ft. in width.

At a mechanics' meeting held at Stockport last week it was decided to form a building trades' federation for the town and district, consisting of representatives of all branches of the trades.

A school at Calderbank was formally opened on Monday by the School Board of Old Monkland, N.B. The building accommodates 450 scholars at a cost of £2,700.

The German church in Bellevue, Edinburgh, has been reopened this week, after having been decorated by Messrs. G. Dobie and Son, of that city.

Trade News.

WAGES MOVEMENTS.

BIRMINGHAM.—A meeting of the Builders' Labourers' Branch of the National Union of Gas-workers and General Labourers was held at Bristol-street schools, Birmingham, on Friday evening, to consider the notice received from the master builders for a reduction in wages. It was unanimously resolved to send a counter-notice for an increase in wages of one halfpenny per hour, and an alteration of the working rules.—The Birmingham branches of the Operative Bricklayers' Society held a dinner at the Colonnade Hotel in that city on Tuesday night, for the purpose of presenting to Mr. T. M. Colmore (Stipendiary) an illuminated address in recognition of the services he rendered to the trade during the recent dispute. Mr. F. Freeman presided. Alderman Cook presented to Mr. Colmore an address conveying to him the thanks of the bricklayers for his services as mediator in the dispute which took place in the spring and summer. Alderman Cook said that the dispute in the building trade caused a considerable amount of irritation, and the termination of that dispute was due to the mediation of Mr. Colmore. Mr. J. Freeman proposed "The Birmingham Master Builders' Association," to which Mr. C. H. Barnsley responded.

DORCHESTER.—The important extension works in progress at the Dorset County Asylum have been stopped owing to a dispute between Messrs. Pethick Bros., the contractors, of Plymouth, and the bricklayers and carpenters. The amount of the contract is £60,000, and nearly 200 men are engaged on the work. The men refused to continue work on Saturday, a proposal of the contractor to reduce the working time by one hour per day during the winter months being the cause of the difference.

LEEDS.—The dispute between Messrs. Obank and Sons, the contractors engaged in the erection of the new Post-office at Leeds, and a section of their workmen, was, after lasting for over six weeks, brought to a satisfactory termination on Friday, by the intervention of the Leeds Board of Conciliation and Arbitration. By the settlement it is provided that in future no engineman shall be employed at the Post-office building in doing work usually performed by labourers. It was agreed that the works should be open until noon on Monday next, Dec. 5, for the return of such of the old hands as chose to avail themselves of the opportunity of going back, and for whom employment can be found. After that time the employers are to be at liberty to engage whom they think fit.

The adjudications in bankruptcy announced in Tuesday's *Gazette* include the name of Walter Sheridan Peckover, of Birmingham, architect.

Mr. Louis Fagan, Assistant-Keeper of the Prints, British Museum, is about to retire, owing to ill-health, from the post which he has held during the last twenty-four years.

The new temporary hospital, Otley, is being warmed and ventilated by means of Shorland's patent Manchester stoves, the same being supplied by Mr. E. H. Shorland, of Manchester.

The Earl of Derby has offered to contribute another £500 towards the completion of the Manchester Cathedral. The whole of the work, including several more stained-glass windows promised, will be completed before Easter next. The entire amount expended has been about £80,000, and Mr. J. S. Crowther, of Manchester, has been the architect.

In celebration of the marriage of Mr. John White, C.E., the Borough Engineer of Folkestone, the staff of employees in the service of the corporation presented that official on Tuesday week with a souvenir, in the shape of a marble timepiece. On that evening the entire staff, to the number of about 130, were entertained to a meat tea at the upper store in the corporation yard by Mr. and Mrs. White.

The Okehampton Rural Sanitary Authority having applied to the Local Government Board for sanction to borrow £2,500 for works of sewerage, sewage disposal and water supply for the village of Hatherleigh, Mr. Samuel J. Smith, C.E., held an inquiry into the subject matter of the application at the Assembly Rooms, Hatherleigh, last week. Mr. Appleton, C.E., the engineer for the proposed works, produced and explained the plans.

Mr. William Eve, F.S.I., having completed 21 years as representative of Stoke Newington parish at the Board of Works for the Hackney district, has been presented by his colleagues, at a dinner at the Holborn Restaurant, with a handsome silver tea and coffee service, as evidence of their appreciation of the valuable services he had rendered to the parishes during that period, for the past 14 years of which he has been chairman of the General Purposes Committee.

STAINED GLASS.

GLASGOW.—A stained-glass window is about to be erected in St. Andrew's Church, Glasgow, in memory of the late Robert Anderson, letterpress printer. The window has been executed by Messrs. Stephen Adam and Co. The design is based on the words of the Psalmist, "God hath anointed thee with the oil of gladness above thy fellows." As interpreting the text, the central part of the window is filled with angel-figures, typical of praise and rejoicing, with harp and lute. These figures are treated after the manner of Early Florentine mosaic work. In the upper part of the window is a free treatment of cherubic figures, scrolls, flowers, &c., while at the base is the inscription.

CHIPS.

The concluding sale of the Egremont collection of old masters fetched very poor prices when offered by Christie's on Saturday. The whole series of 134 pictures, chiefly by and after the old masters, only brought £2,324—the only prices worth noting being "The Entombment," by Albertinelli, 295 guineas; "The Betrayal of Christ," said to be by Vandyc, 810 guineas; and "The Rape of Europa," by P. Veronese, 195 guineas.

Before Lords Justices Lindley, Bowen, and A. L. Smith, on Friday, an appeal was heard by the Barry Railway Company against an order of Mr. Justice Kekewich, restraining the company from proceeding with a reference to the arbitration of their engineer of a dispute which had arisen between them and Mr. Jackson, the contractor for works they are constructing at the Barry Dock. The Court, by a majority, allowed the appeal, and discharged the injunction, Lord Justice A. L. Smith dissenting.

The theatre at Lincoln, an old building which had been frequently renovated and partially reconstructed to meet modern requirements, was destroyed by fire on Saturday. The damage amounts to about £3,000.

A monument is to be erected to the late Cardinal Lavigerie at Carthage. Signor Anderlini, the Roman sculptor, has been charged to execute the work.

The Clitheroe Town Council decided on Friday to apply for powers to borrow £20,450 for the construction of sewerage for the borough. Up to the present the town has not had any proper sewerage scheme.

The foundation-stone of the new Higher Grade School for Wolverhampton was laid last week. Mr. T. H. Fleeming, of that town, is the architect, and Mr. Henry Lovatt, also of Wolverhampton, is the contractor.

The bridge which carries the Midland Railway across the Avon just outside Bath Station is being reconstructed after 23 years' use. On Saturday the contractors, Messrs. Handyside and Co., of Derby, commenced operations on the arrival side of the bridge, and this is expected to be renewed in ten days. The other portion will not be dealt with until after Christmas. Relays of men work night and day on the job, electric lights being provided. The work is under the supervision of Mr. Meredyth, district engineer, Gloucester.

St. Peter's Hall, Church-street, Liverpool, was completely destroyed by fire on Sunday. The hall was formerly the home of the Liverpool Academy, and was the scene of many annual exhibitions of pictures. It was afterwards used chiefly for bazaars and public meetings, but latterly has been used as a billiard-room.

The Wesleyans have opened a new chapel at Wolverton, which has cost £2,500, another at Bideford, which has cost, with the site, £6,000, and a third at Upton Park, East Ham, which has cost £4,000.

At a special general meeting of the Royal Anglo-Australian Society of Artists, held on Tuesday, the following artists were duly elected members—viz., Colin B. Phillip, R.W.S.; F. W. W. Topham, R.I.; W. B. Wollen, R.I.; W. W. May, R.I.; Sutton Palmer, R.B.A.; G. C. Haité, and Allan Hook.

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TENDERS.

Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

CATERHAM.—For additions and alterations at Thornhill, Caterham, Surrey, for Mr. Andrew Lockie. Mr. Chas. H. Wiltshire, 13 and 15, Walworth-road, S.E., architect:—

Thompson £1,150 0 0
Hoskins (accepted) 1,093 0 0

ACTON.—For alterations and additions to the Priory Board Schools, Acton, W. Mr. Edward Monson, jun., F.R.I.B.A., Acton Vale, W., architect:—

Sole and Son, Richmond ...	£4,600 0 0
Flaw and Co., West Kensington ...	4,487 0 0
Tozer, F. R., Notting Hill ...	4,282 0 0
Bagge, T., Acton Green ...	4,261 0 0
Whitehead and Co., Clapham-road ...	4,250 0 0
Tout, W., Hendon ...	4,250 0 0
Billins, J., Hounslow ...	4,214 9 0
Jarvis J. H., Surbiton ...	3,975 0 0
Lascelles and Co., Bunhill-row ...	3,973 0 0
Martin and Co., West Croydon ...	3,947 0 0
Chapman, J. G., Hounslow ...	3,944 19 10
Martin, A., Battersea ...	3,895 0 0
Lyford, G., Shepherd's Bush ...	3,857 0 0
Akers and Co., South Norwood ...	3,750 0 0
Hooper, G., Acton ...	3,740 0 0
Bray and Clayton, Acton ...	3,736 16 0
Nye, T., Ealing ...	3,697 0 0
Tollinson, J. F., Teddington ...	3,560 0 0

* Accepted subject to the approval of the Education Department.

BATTERSEA, S.W.—Alternative tenders (a) for providing ceilings of fibrous plaster, and (b) for match-boarding twelve ceilings at Shillington-street school, Battersea:—

	A.	B.
Mowlem and Co. ...	£295	£236
Nightingale, B. E., Albert Embankment ...	292	165*
Charteris, D. ...	230	206
Holloway Bros. ...	229	260
Hammond, W. ...	228	244
Lathey Bros. ...	210	235

A.—Fibrous plaster. B.—Match-boarding. * Accepted.

BATTERSEA, S.W.—For fitting up the schoolkeeper's house at the Latchmere School, Battersea Park-road, as a cookery centre, for the London School Board. The Committee proposed that the house on the site, previously in the occupation of the schoolkeeper, should be adapted for this purpose. Tenders were accordingly invited for carrying out this work, but as only four tenders were received, the lowest of which was in excess of the architect's estimate, fresh tenders were invited from seven contractors, one of whom, however, was unable to submit a tender. The amounts of the tenders in the two competitions are set out below:—

A.—First competition:—	
Hammond, W. ...	£875 0 0
Derry, J. ...	863 0 0
Holloway Bros. ...	844 0 0
Garratt and Sons ...	810 0 0
B.—Second competition:—	
Parsons and Co. ...	£835 0 0
Kent, G. ...	254 0 0
Garrett and Sons ...	250 0 0
Barker, E. ...	250 0 0
Triggs E. ...	220 0 0
Humphrey, C., High-street, Fulham ...	199 10 5

* Accepted.

BIRMINGHAM.—For the erection of two houses in Livingstone-road, Handsworth. Mr. H. Hugh Allen, Small Heath, Birmingham, architect:—

Squires (accepted) £590 0 0

BIRMINGHAM.—For the erection of two houses in Tennyson-road, Small Heath. Mr. H. Hugh Allen, Small Heath, Birmingham, architect:—

Edmunds (accepted) £730 0 0

DORKING.—For building a private residence on the Holloway Estate, for Mrs. Randall. Mr. F. J. Dibble, architect:—

Edser ...	£1,377 0 0
Canter ...	1,339 0 0
Goddard and Sons ...	1,195 0 0
Colls and Sons ...	1,275 0 0
Hamblin Bros., Dorking (accepted) ...	1,225 0 0

DUDDINGTON.—For erection of new schools and out-buildings at Duddington, near Stamford, Northamptonshire. Mr. J. B. Corby, F.S.I., Stamford, architect:—

Hipwell, S., Wisbech ...	£885 0 0
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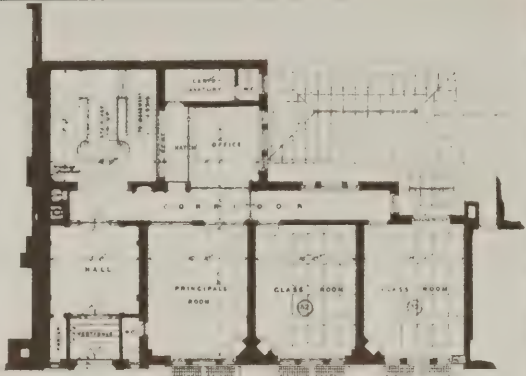
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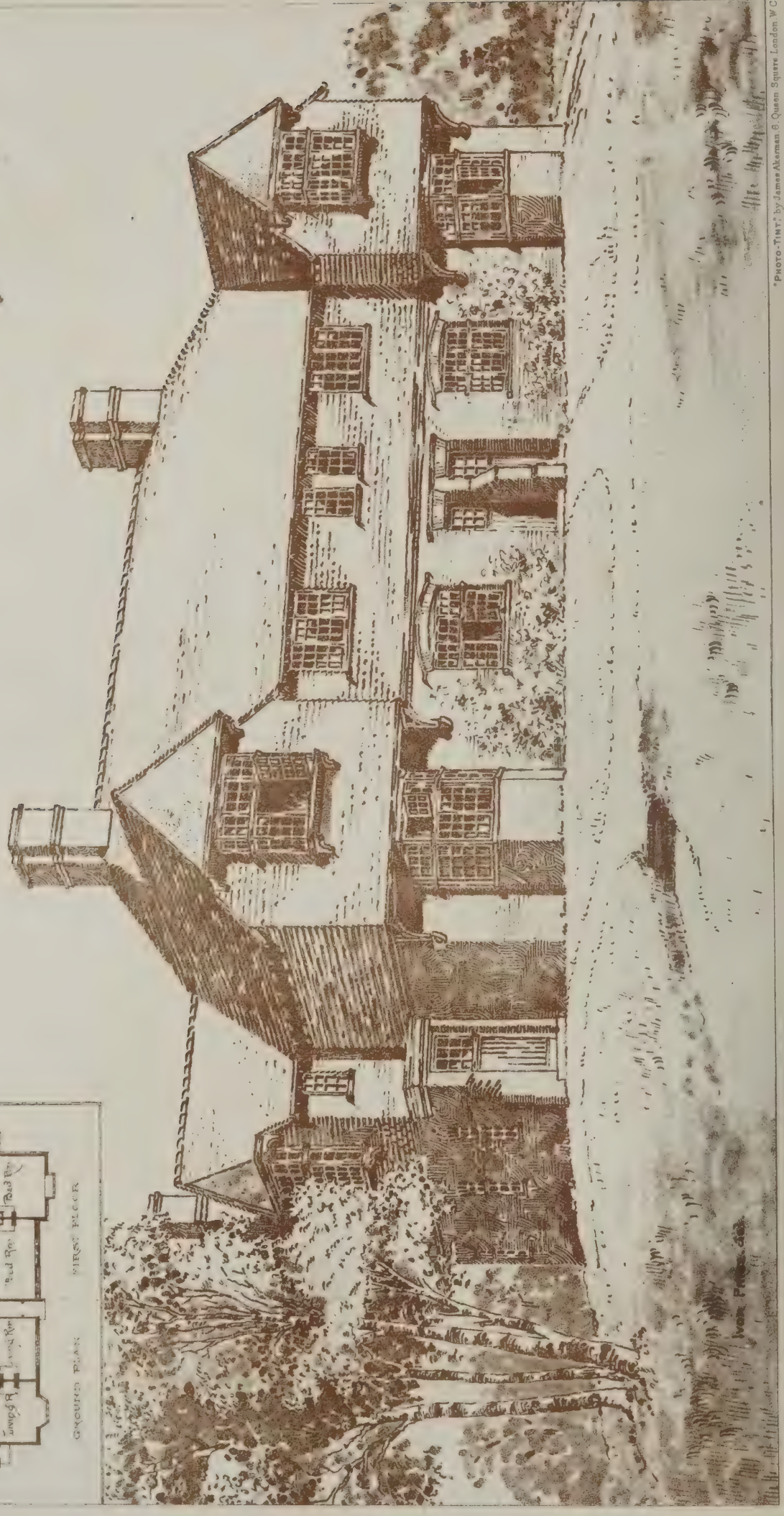
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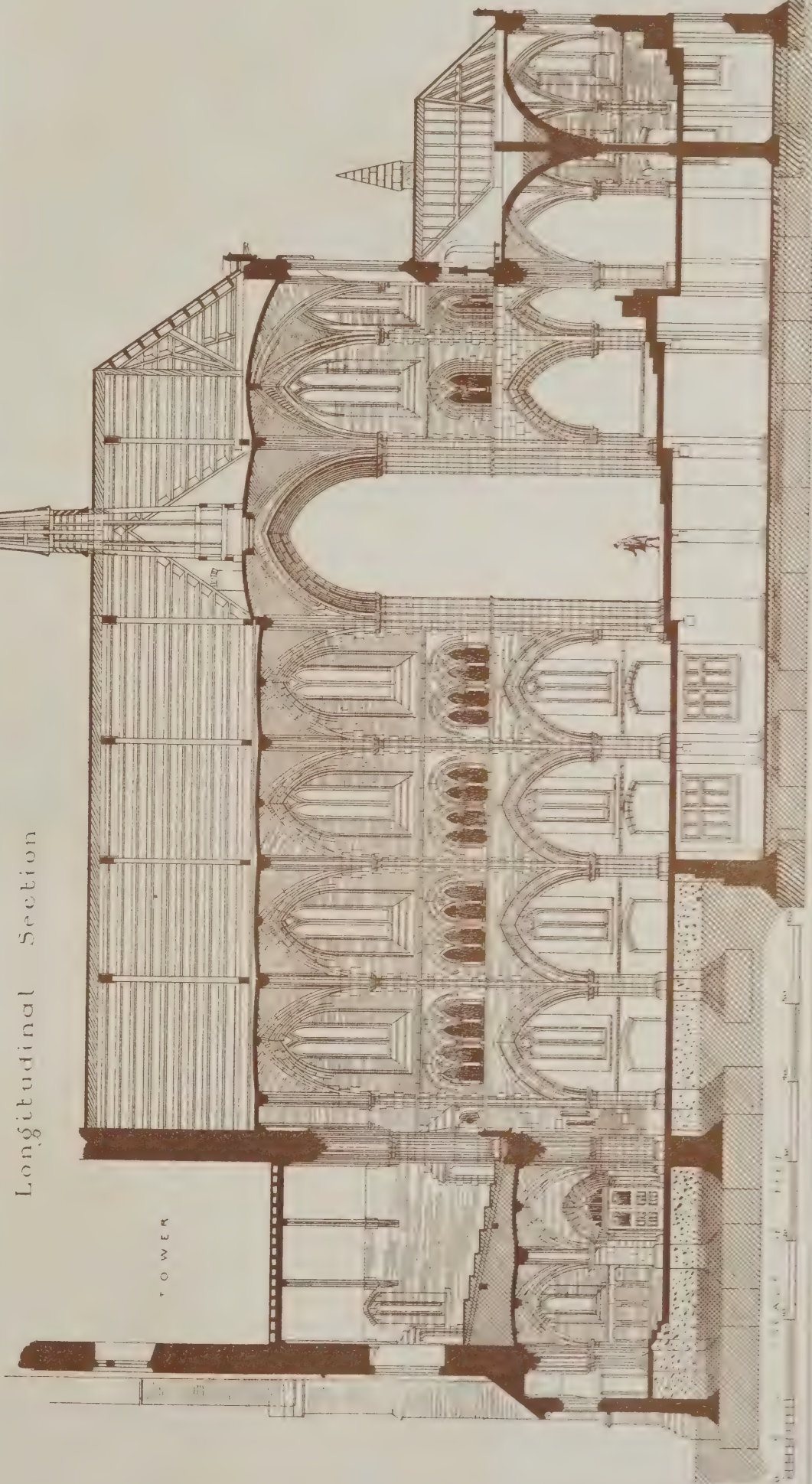


THE BUILDING NEWS, DEC. 2, 1892.

S · PHILIP'S CHURCH
STEPNEY

Arthur Cawston
Architect

Longitudinal Section



A House at Weybridge.

MR. F. STEWARD-TAYLOR A.R.I.B.A. Architect.



Ground Floor Plan

House near Windsor
for his Grace
The Duke of Sutherland, K.G.



Ground Plan F. Lovell Lee Architect





AN OLD HOUSE IN ROUEN.

FROM PHOTOS BY COMMANDER

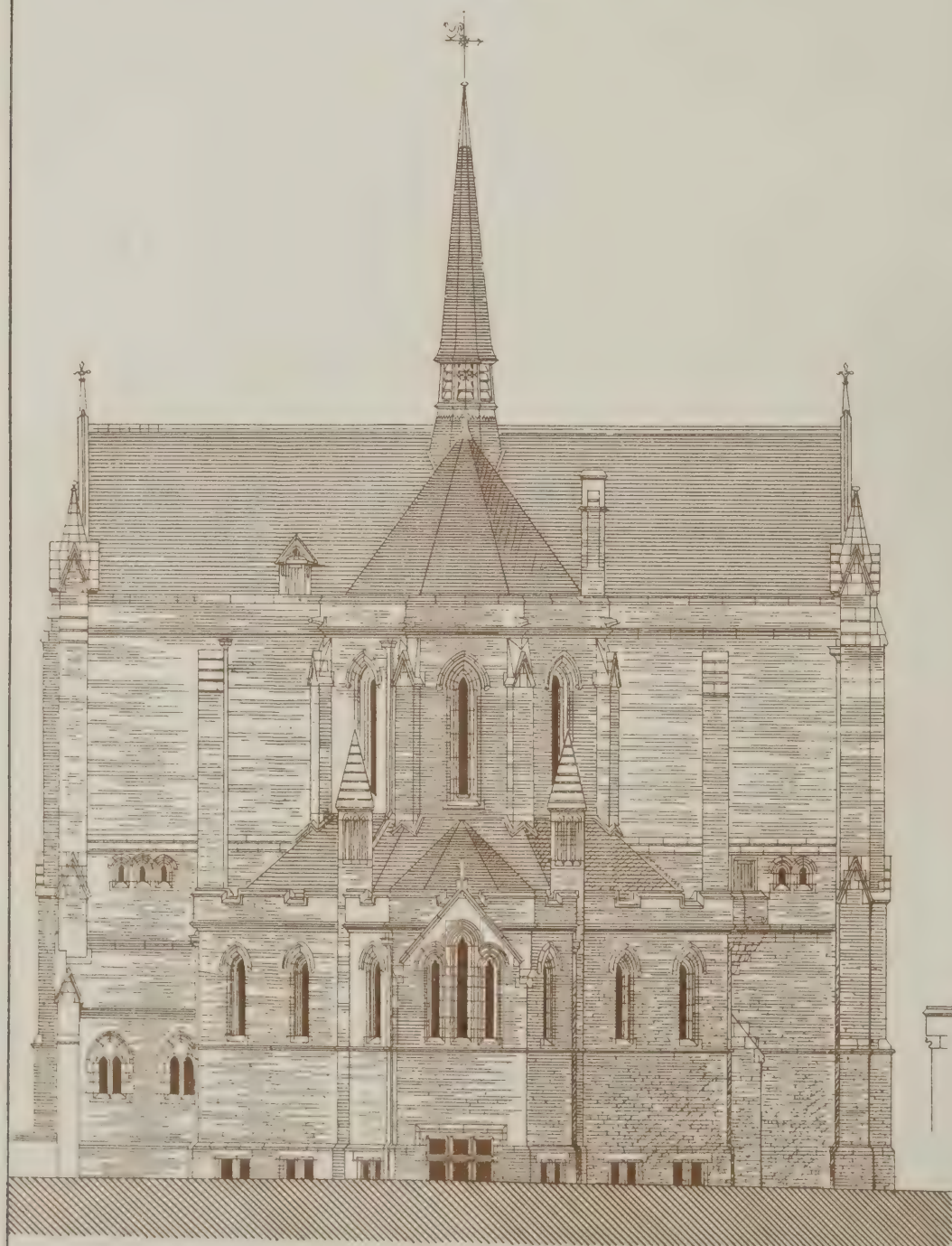
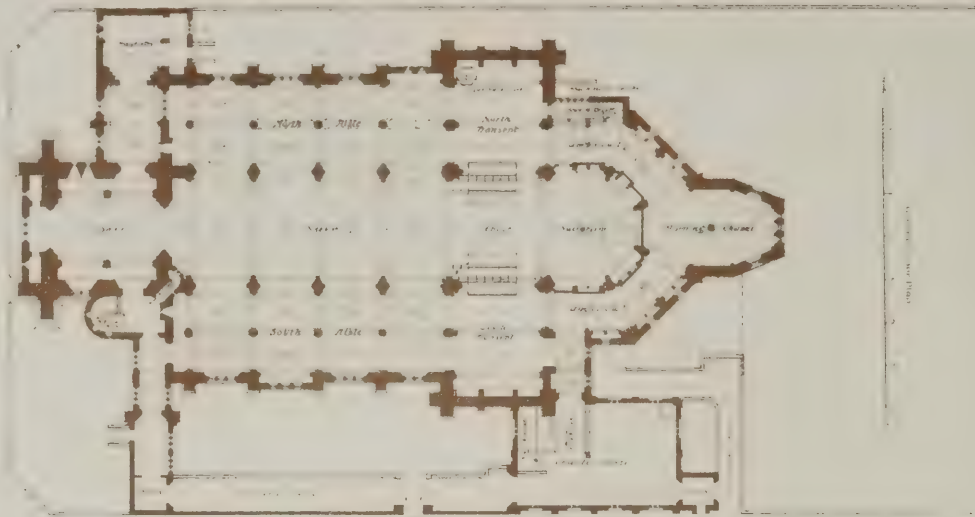
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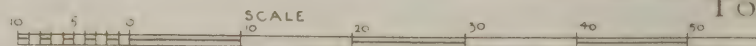
PHOTO-TINT by James Akerman Queen Square, London, W.C.

AS. E. GLADSTONE. R.N

SOUTH PORCH OF THE CHURCH OF ST GILLES CAEN



East End



To

S · PHILIP'S CHURCH STEPNEY

Arthur Cawston Architect



THE BUILDING NEWS

AND ENGINEERING JOURNAL.

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FRIDAY, DECEMBER 9, 1892.

UNSOLVED PROBLEMS.

THERE are some things which baffle the resources of the architect, or of those who desire to erect buildings which shall satisfy all scientific requirements, and yet be amenable to certain canons of good taste which we call artistic. Quite true it is that the greatest effort of skill in architecture, as in engineering, is required in satisfying apparent irreconcilable requirements; in short, that it is the conquering of what seems to be an insuperable obstacle that constitutes the greatest merit in a work of art. Whenever the problem is easy and smooth the mind is apt to relax its effort, and to fall into commonplaces. It thinks what has been so often done before will do again, and the design, whatever it may be, becomes a repetition of one type or building. The domestic architect who has a large practice in house-building will need little more effort than an ordinary share of skill. The requirements are much the same; walls and roof admit of no new departures, and no new materials have to be introduced. The man who has a large business in designing commercial premises seldom has anything very novel to carry out; probably his chief *crux* is the necessary disguising of the iron girders and columns, if he troubles about them at all. The church architect, again, has seldom any problem to solve, if he adheres to the Mediæval model—one reason why so many churches are characterless copies. It is only, indeed, when he seeks to introduce a new feature or adopt another way of doing something—such as a narthex or baptistery or treatment of chancel, or eastern termination, that he overcomes the temptation to follow some old model and the inertness of commonplace. We have conspicuous examples of this freshness in the late Mr. Sedding's work, and in churches erected by the late Mr. Street, Mr. Pearson; in the new churches of St. Philip, Stepney, All Saints', Dulwich, and others. With these exceptional instances there has been an easy compliance with the dictates of style and fashion; it has been simply the following of a formula. But when any new departure has to be made, the architect has to set aside his formula and begin to discover a mode of construction that will give the required result, he has to exercise his artistic power on a new problem, and it is then that his real ability as an architect is seen.

We will endeavour to point out one or two directions in which new building problems present themselves. Let us take an exhibition or market building which has to provide a large covered area. The mere builder may assume that any huge shed will do; but such a solution is not architecture. Then the roof must be of iron, of stability enough to resist the vertical pressure due to weight and the stress of wind; it must be constructed to admit light. Its form and construction must be determined by the shape of the area covered. A precedent may only hamper the designer by excluding from his mind any original idea. We have plenty of instances where genius has been stifled in the initial stage, leaving a costly blunder as a warning for all time. For constructional ingenuity and skill, probably the experiments now being made at Chicago for the Columbian Exposition buildings have not been surpassed; but the immense spans of the roofs have led rather to a display of *tours de force* than good design. The Liberal Arts building, with its huge trusses of braced steel of 368ft. span from centre to

centre of pins, and of 205ft. rise, is a fine example of trussing; the main building of the Machinery Hall is another immense rectangle about 850ft. long, and nearly 500ft. wide, covered by three parallel rows of circular shaped lattice arches or ribs, each of 130ft. span and 57ft. rise, the springing line 36ft. above the floor. Each arch is pivoted at the springing and crown, which allows for the rise and fall due to temperature. These three parallel rows are crossed at the centre by a transept of three low circular domes, each of 130ft. diameter, with lanterns over each. There is here the germ of an architectural structure of metal if only better proportions had been given to the domes. We hear one exclaim, Can any architecture be got out of steel? We must boldly take the bull by the horns and make something of these skeletons of iron. If we can only give them agreeable proportions, and put them in the right position to form a good roof, one step of the problem has been taken. The second is how to improve the details of lattices and bracing. In the design of these structures, the setting out of plan—that is, how to dispose the roof—is the main thing, and no doubt to preserve certain ratios between the length and width, the distances of the roof trusses apart, and the heights of the different parts of the inclosed area contribute towards the result. But architects have thought too much of adopting ornamental trusses and accepting old plans of buildings of very different materials and objects than to trouble about thinking of a new problem, so much easier is it to vary and elaborate old forms than to design something original.

Another bugbear of the architect is the acoustical building. A most careful study of the theory of acoustics does not help him one iota. He may be told that certain buildings are almost perfect in this respect, and he adopts their proportions, only to find that some other conditions to success are wanting. The most costly, handsome, and architectural interiors are bad both for speaking and music, while some temporary or plain apartment has admirable acoustic properties. No one can explain why the most commonplace hall or lecture-room in the town is so good for speaking in, while the costly and recently-built town-hall, designed by an eminent London architect, has been denounced by all speakers and musicians. But the fact remains. All the architectural expedients of groined coves, elaborate panelling, lanterns, have added nothing to the acoustical qualities of the room, but have rather broken up the sound and created noisiness and echo. All the angles of the new town-hall are rounded, the platform end has been made curved, but still the voice is not clearly heard at the other end. The old room with its plain walls rectangular shape, and flat ceiling of ordinary height, is in every way superior for meetings and lectures. The fact astounds the architect. His study of acoustics and his theories about forms have not borne any fruit. Why? Because he has been satisfied with designing his plan and section first, before studying those properties and details which have been found to give the best results acoustically; contented if he tries in matters of detail to satisfy the requirements of certain laws. In plain fact, the acoustic conditions are not discovered and applied to a room or building from the first, but are sought to be worked back to, or introduced afterwards, by cutting off the angles of room, by making the platform end circular, or confining the sound within the orchestra by a lower ceiling. The result is remedial, not constructive. The problem is to design the room so that it may comply with the laws affecting the propagation and transmission of sound, and at the same time be architectural in shape and details. But the architect stands aghast at such a problem, instead of

boldly attacking it. How can the form and proportions of a trumpet or violin be applied to a room; how is the important law of sympathetic vibration to be fulfilled in the construction? Again, the fact is well established that a room that is good for speaking may be bad for music, and *vice versa*, so that there is another initial difficulty here, for it is known that the vibrations which produce musical sounds are periodic and regular in their intervals, while those which are unperiodic and irregular produce noise, and in the latter category is speech. Dr. Robert Hooke, in fact, a century ago, showed that musical sounds could be produced by the teeth of wheels made of equal size; but for vocal sounds they had to be of unequal size, so as to produce unequal strokes. But how are these two laws to be applied to our churches, chapels, concert-halls, and lecture-rooms? If it be a fact that sound can be reinforced by setting up a vibration in bodies which will vibrate to the same note, how can this rule be applied to a church, where both vocal and musical sounds are produced? We can easily illustrate this law by the simplest experiment with a tuning-fork applied to a sounding-board or organ-pipe, to prove the value of sympathetic vibration in a room destined for musical performances. If the architect can regard his building as an inclosed space of air, a reinforcing body, then it seems to follow that he may give it such ratios of length, breadth, and height as will insure the production of musical sounds. This, at least, is the conviction of many, and the burden of some interesting remarks lately made by Mr. H. C. Kent, M.A., before the Sydney Architectural Association.

For speaking purposes a circular or horseshoe form of plan is supposed to give the best results, the dimensions of which are limited to a distance in front of the speaker at which he can be heard, and to a distance on each side and behind him. Wren gave 50ft. in front of the speaker, 30ft. on each side, and 20ft. behind; Saunders has given 92ft. in front, 75ft. on each side, and 31ft. behind; but these dimensions are approximate, and cannot be always relied upon when so much depends on the materials, and especially on height. The latter should be limited if undue resonance, absorption, and reflection of sound are to be avoided; and it is generally considered that the space behind the speaker should be contracted in width and height, and partake rather of the trumpet form. But for buildings for orchestral performances, harmonic proportions of simple ratios are the best to reinforce the musical sounds. The ratios of two to three to five or six have produced successful results, or a height of 52ft., a width of 78ft., and a length of 130ft. For buildings adapted for music height does not seem to be destructive or prejudicial, as our lofty cathedrals and churches afford good examples of the value of a body of resonant air to give support and richness to the tone. Very little will be done, however, till architects begin to think out for themselves the solution of this and other cognate problems in architecture, so as to arrive at some definite type of structure, rather than being content to follow old examples. Careful experiments of transmission of sound in different buildings, both for speaking and music, would lead to some valuable results from which principles might be deduced.

WINDOW DESIGN.

LITTLE attention is given to the modes of setting out and spacing window openings. We find architects following a certain style with a blind adherence to some example rather than pursuing a definite principle in the design of their elevations. The rule of studying plan and elevation

simultaneously hardly appears to be followed. An elevation is sketched out after the plan has been made, and the openings are left to take their chance. Lucky if they fall into anything like order or good spacing. The amount of light and the height and width of each opening are questions that first demand the thought of the designer, as upon these points the relation of opening to wall space will be regulated. If the rooms are of some depth from front to back, the windows ought to be proportionately large or high; but if shallow, they may be made smaller. Our remarks here, however, concern the design of windows in a façade as one of the means of expression, and this, it must be confessed, is a subject that has given way largely to question of mere style. There are, it appears to us, two main causes of failure in the design of our façades: first, the crowding of small windows, and second, the want of distinctive character in their design.

A number of equal-spaced windows in a front is distracting and unsatisfactory, and is generally the mark of inferior design. The second fault has arisen mainly from the idea that an elevation is a given space which has to be filled with windows and pilasters and other decoration without any regard to solids or voids. The lesson for the designer to learn is the effect of altering the proportion of opening to solid walling, for if he once understands the result of the alteration, he can bring the resources of his art to the problem. Let us for a moment consider the subject in an experimental way. Suppose there are three windows, the two intervening wall-piers being each, let us imagine, equal to the width of opening. Let us further imagine the windows to be perfectly plain openings in a flat wall, and, say, of the proportions of double squares. Above these openings are three others of similar size and proportions. The effect upon the eye is that there is as much solid as void, the windows look what they are, simply openings, and there is no design worthy the name of architectural in such an arrangement. A wall pierced by oblong apertures at regular intervals can have no design except mere mechanical division. There is enough of the wall to be recognised as such. We may surround each window with a moulding or architrave, which will tend to disguise the hole-in-the-wall idea a little; but this framing does not alter the effect. But let us introduce a pilaster or a column in each of the two intervening solids, and the interest will be immediately centred on the piers. A little importance may be gained for the windows by placing pediments upon them, and converting their jambs into pilasters; but still the piers will retain their prominence, and the façade will be visibly enriched by the change—be made, in fact, architectural, the whole effect heightened. Any Italian Renaissance façade illustrates this kind of design. We may widen the piers, making them one and a half of the windows, but still they will not lose the essentially pier character, but if we widen them still more—say, to three-window widths—the wall character will return.

On the other hand, let us make the piers narrower. They will assume more and more of the mullion character. So that by this little trial we have learnt two things: First, by planting a column or a pilaster on a pier between windows we can change entirely the character of the design, and convert the wall into a pier, altering entirely the hole-in-the-wall look of the front, and by narrowing the pier we may give it a mullion character; secondly, by widening the intervening wall-space we give the wall importance. Now let us consider the matter from the window point of view, instead of the pier. By narrowing or emphasising the pier the window assumes less importance architecturally and its hole-like character totally

disappears; on the contrary, when the piers or wall spaces are widened the window becomes a feature, and attention is centred upon it more or less, according as it is pronounced by ordinances or decoration.

This general and broad division of the subject, therefore, naturally suggests, first, attention on the *window* opening, and, second, on the *pier* or *mullion*. When the window area is, therefore, reduced in comparison with the wall, the eye at once is arrested by it, its form and decoration, but when it occupies a large area proportionately, the solids come into notice. This consideration may help architects to decide when they ought to pay attention to the external decoration of their windows, and how they might give some character and expression to their designs by taking into account the disposing of their piers and mullions. At present we see very muddling arrangements; some architects appear to think that there is no art in window distribution, that it makes little difference whether they are near one another or far apart; they imagine that close-set windows ought to have as much decoration as those with considerable wall space around them. Two things are pretty evident—namely, that in commercial buildings in which large windows or open fenestration is necessary the design of the elevation will be mainly in the distribution and arrangement of the piers or mullions; but when the apertures are small, these apertures require the chief consideration, and a large amount of ornamentation may be lavished on them. The window may be looked upon as a point of interest—like a framed picture on a wall. In the Italian Renaissance, it may have the usual ordinances of engaged columns, entablature and pediment, with plinths, and balustrade below; or the Palladian decoration, consisting of a pediment supported on consoles outside the architraves, which we may see in the Banqueting House at Whitehall, or the rusticated forms we see at Greenwich Hospital. All these are so many different ways of framing the window and making it a distinctive feature on the decoration of the façade; the wall in this case is neutral, and appears simply as a background to the windows.

We see buildings where the apertures are so distributed that no distinctive feature is made of them, and the wall space is frittered with pilasters and other ornament. These designs fail, because neither the pier nor the window has any distinctive character in the design. Many of the hotels in Northumberland-avenue have been spoilt by non-observance of the simple rule, and the result is a confused arrangement, the eye is distracted by a multiplicity of small openings and details instead of being led to the windows or the piers.

The effect of spacing and distribution of window openings is one of the most powerful in the limited means of the phonetic in architecture. A building pierced by a few small apertures, like a fortress or a prison, has all the heaviness and gloominess characteristic of those structures. On the contrary, the open fenestral façade awakens sentiments of precisely the opposite character. Even the ignorant in architecture are affected variously by the proportion of wall to window. There is something austere and repellent in the crenellated and machicolated keep, gay and attractive about Henry VII.'s Chapel, or the King's College Chapel, Cambridge. The relation of solid to void appeals to our sympathies, and is one of those elements of the poetic in architecture which must ever be recognised.

In London, Manchester, Leeds, Glasgow, we have opportunities of studying the two kinds of fenestral composition referred to—the former the mullion treatment, and the latter the pierced wall. Contrast Barry's noted Reform Club-house in Pall Mall with that of the Army and Navy

and Carlton Clubs; or, to refer to more recent examples, let us take Mr. Norman Shaw's New Scotland Yard front and St. Stephen's Club-house: one has the solid wall pierced by apertures, the other is made up of piers and mullions. In the commercial parts of the City, and in Manchester and other towns, the window has gradually become to mean an arrangement of voids divided by mullions, the wall disappearing in the demand for glass. Sometimes this style of façade assumes the appearance of a framework made up of uprights and transoms, the apertures being all windows. We have many other examples of this sort to be seen in Oxford-street and in the City, in which the windows constitute large open panels divided by strips of masonry.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the meeting of the Institute, held on Monday evening, the President, Mr. J. MacVicar Anderson, introduced to the members, in a few cordial words of welcome, Mr. William Emerson, who was at the business meeting held a fortnight previously unanimously elected honorary secretary, in succession to Mr. Aston Webb, resigned. Mr. Emerson briefly returned thanks.

The President stated that the Council had awarded the Ashpitel prize of books having the value of ten guineas to Alfred Charles Houston (pupil of James Edmeston), he having, in the opinion of the examiners, most highly distinguished himself in the examinations in architecture during the past year. High commendation had been given by the examiners to Harold Brakespear, of Manchester, and the Council had, therefore, awarded him a special second prize of books value five guineas.

SOME PROBLEMS OF TOWN AND CITY DEVELOPMENT.

Mr. WILLIAM C. STREET read a paper on this subject illustrated by several diagrams to large scale, including Sir Christopher Wren's original plan for the rebuilding of London and a sketch, prepared by himself, of a radial or spider's web plan for the ideal development of a town on the bank of a river. This gridiron sketch might possess some merits of economy and convenience, but was forbidding in effect, and was received with general disfavour. Mr. Street argued that in the extension of any large city, architects and public authorities should show more consideration for the surroundings and requirements of the population, and should work in accordance with an approved plan for future development. A great enemy to any such beneficial development had been the land-grabber who, having purchased land in the outskirts, planned as many streets as possible for the sake of the ground-rents. Good main thoroughfares, with ornamental open spaces at convenient distances between them—the minor streets being sufficiently wide—were to be desired. In certain cities regulations existed to prevent the building of dwellings outside certain limits until the intervening spaces were filled up in accordance with an agreed-upon scheme. Such stringent regulations might at first frighten those who looked upon so-called natural developments alone as being beautiful; but that was an open question. A square or rectangular development, as of American cities, the author thought, was unnatural, the tendency in all cities being for the traffic to pass and repass upon lines radiating from the centre where the principal business was conducted. The impression given by such radial development was far from unpleasant. Mr. Street considered the separation of the classes neither healthy nor natural. In laying out a district it was better for the health of the dwellers in the main avenues that in the minor streets adjacent the buildings should be less in height than those in such avenues, the air at the back of the higher buildings being open to the circulation of currents at a lower level, and not so stagnant and unhealthy as when the space was inclosed on all sides by lofty buildings. In laying out open spaces, the dank, circumscribed, and prison-like look general to London squares should be avoided; and the provision of large parks, stiff, flat, and uninteresting, was not at all what he intended. Having quoted 45 Vic. cap. 14, sect. 14, with reference to air-space round buildings, the lecturer said the provision of practically a strip

of open space 10ft. wide at the rear of a building, while it might be sufficient for some buildings, would be manifestly inadequate if the building was of very great height, and, any regulation in regard to open space should have reference to the height of the buildings. The revised regulations of the proposed General Building Act might, he thought, be that no building whatever should hereafter be erected of a greater height than the width of the street, and that every building in the rear thereof should have a strip of land belonging to it of a minimum width equal to one-fourth the height of the building; the height of the one-story building to be allowed in the open space should also be limited, 12ft. to the eaves being the extreme limit. By the London County Council (General Powers) Act, 1890, no building was to be of greater height than 90ft., and in the draft suggestions for a new Building Act, that maximum height was reduced to 75ft., and might, he thought, be further reduced with advantage. Under those suggestions, when streets 50ft. wide ran in parallel lines, and the buildings were 40ft. deep, there would be two 40ft. front buildings, and two 12ft. 6in. open spaces; the distance between cross-streets being 105ft., or 150ft. from centre to centre. A blot on that arrangement would be that houses in the main thoroughfare would hinder the access of air to the space at the back of the houses on the cross streets, and, therefore, there should be a minimum width of 25ft. between the backs of houses in the main road and the sides of those in cross-streets. The Model By-laws recommended a minimum width of 25ft. for all houses of a height of 35ft., or more, and if that were generally adopted air-space around buildings would be liberally provided for. As to street improvements, the width of 40ft. seemed to be fixed for subordinate developments, and in some thoroughfares recently constructed the width of 70ft. had been adopted. Subways should be constructed under all main streets, and the several gas, water, electric light, telegraph and telephone companies paying rent for the space occupied by their mains would practically repay the cost of construction. Mr. Street turned to the question of dwellings for the labouring classes, and deprecated the erection of large blocks of these buildings. London, far from being overcrowded, did not accommodate one-eighth of the number of people that was possible on a similar area, as 400 persons could be housed in block buildings on one acre, allowing an average of 2,000 cubic feet to each person; at present the proportion was 54.4 per acre, and if the erection of lofty blocks was at all likely to bring about such theoretical limits, that of itself ought to be a sufficient reason for discontinuing their erection. Small tenements might be expensive as compared with blocks, but there might be advantages to counter-balance that of cheapness.

A discussion followed, in which Messrs. WILLIAM WOODWARD, LEWIS ANGELL, of West Ham, ARTHUR BAKER, HENRY DAWSON, H. MACLACHLAN, P. GORDON SMITH, architect to H.M. Office of Works, BOND, late surveyor to the Charity Commissioners, and THOMAS BLASHILL, superintending architect to the London County Council took part.

ARCHITECTURAL ASSOCIATION.

THE fourth meeting for the present session was held on Friday evening, the President, Mr. H. O. Cresswell, in the chair. The following five new members were elected:—W. E. Sedgwick, W. R. Davidson, H. C. Trimnell, C. Perks, and A. J. R. Ley.

DAYLIGHT IN THE DWELLING.

Mr. JOHN BRETT, A.R.A., F.R.A.S., read the following paper on this subject:—In inviting a painter to read a paper to you this evening, your committee do not necessarily imply that a painter can be an authority on architecture; but that he may, perhaps, know one or two things about the lighting of a house that are not usually learned in architects' offices, but which yet may have some practical importance. No other profession in the world has such control over the destinies of men in general, but specially of painters, so I feel sure you will good-naturedly consider their wants before you put in your windows. We shall all readily admit that the first requisite for a dwelling-house in this climate is that it should keep out the weather, and it can

easily be shown that the next essential quality is that it should let in the daylight (when there is any). I propose to explain in the first place what good lighting means, and how the windows should be placed so as to enable you to see things well inside the house. My next endeavour will be to show how the daylight, having been admitted, can be economised and utilised by reflection, and that the artistic treatment of the interior largely depends upon reflected light and on the quality of the reflecting surfaces. You can have a very comfortable life in a tent, and a considerable portion of mankind for generations have found tents quite good enough for common purposes—to eat, to sleep, and to die in. But civilised man has a want which a tent cannot supply—viz., a place for the exhibition of his treasures, especially the treasure of beauty, for which stability, permanence, and good daylight are wanted. He also requires a base of operations for his enterprises, a museum for his archives and trophies, and, above all, for the convenient arrangement of his intellectual resources—for his books and his pictures. He may also require means for the entertainment of his neighbours and his children, and for seeing them to the best advantage. If you can admit that a painter knows anything, you may be sure he knows how to light a picture so that its merits may be well seen, and I think the lighting of pictures is an excellent criterion of the lighting of the house—indeed, a very crucial test of it; but it is evident from our daily experience that many architects have never heard of such a principle, and will exclaim with certain disciples of old, "This is a hard saying. Who can hear it?" Now, it is not practicable to build for a single individual; you must build also for his guests and for the public. Your client may be the most ignorant vestryman in the three kingdoms, but he will not owe you any thanks if you work down to his own personal level. Even if he devotes his whole life, say, to the choosing of bacon or cheese, he will still like to leave behind him when he dies such a house as shall have the approval of the more cultivated men of his day. Therefore you must provide for the housing of works of art, although they are not mentioned in the specification. When you have done your best the house is sure to have defects. Some of these will probably carry with them compensating advantages, and some can easily be lived down by a philosophical tenant; but defective lighting you will find very difficult to deal with, and in most cases incurable. Daylight is more or less necessary for our physical health, for cleanliness, for the preservation of our possessions from damp, from mildew, and other enemies, but it is indispensable for the seeing of beauty. A large quantity of daylight is not the chief consideration. A glass house or a lantern is eminently unfit for a human dwelling, since snugness is a most desirable quality, and for your banquets artificial light is better than natural daylight, as I will explain later on. The most common form of beauty harboured in houses consists of pictures. I use the word pictures in a broad sense, comprising all such beautiful things as can be shown on the walls. I do not refer to the great art of sculpture, because that is considered by many of us as an essential part of architecture. The daylight under which pictures can be well seen may be either direct or reflected. If direct, it should *not* fall normal to the surface. It may come from the right or the left, or from the top; but it must not come from behind the spectator, for two simple reasons. The first reason is that his own shadow will fall on the field of view, and the second that the surface of the picture will shine; so that the wall opposite the window is not a picture-wall. The aspect of the window is not of much consequence, for although direct sunshine kills delicate colour, and is not adapted to show anything well, it can generally be diffused sufficiently for most purposes by a blind of fine texture, and the architect is not much concerned, because the exigencies of the site and the plan will already have determined the aspect for him. The subject of skylights may be put aside for the moment, and windows taken to mean perpendicular openings in the wall. The placing of them should be decided simply on utilitarian grounds—that is to say, how the most wall space can be well lighted. External appearance need have no weight in the argument, for a man who cannot make any possible windows compose well in the elevation is not an artist at all, and, therefore, not an architect. I may even go so far as

to say that the more irregularly, unsymmetrically, and arbitrarily they are placed, the more scope there will be for developing a picturesque building. From an outside point of view—that is as far as the public are concerned—picturesqueness is the happiest attribute to be hoped for in a domestic building, since it will seldom be large enough to have any claim to sublimity or impressiveness. But there is this to be said on the other hand, that there is no worse form of affectation than the effort after picturesqueness for its own sake. In streets or terraces there is not much room for choice in the placing of the windows, so we generally find such houses comparatively well lighted. It is where the phantasy comes in, as in the country house or the villa, where your architect is rampant, that you may expect to see some artistic flourishes, constructive mistakes, and incurable lighting. If you design your house strictly from the inside, and on merely utilitarian principles, a good external effect is inevitable, or can only be missed through a singular degree of ignorance or meanness. Of course, if you are ignorant of construction, or if you want to produce a more gorgeous appearance than you can honestly afford, there is no redemption for you; you are bound to fail and to wish that you had never been born, for a mean building is usually destined to encumber the earth, and to disgrace your name for at least ninety-nine years. Let us at once assume that your client or his heirs will have some beautiful things to grace the inside of their dwelling, and we should not overlook the circumstance that his daughters may be comprised in this category, so we must be careful to light carefully this living sculpture, no less than the flat surfaces of the wall pictures. A happy expression on the human face is largely dependent on reflected light, which concerns surface treatment rather than construction; but the fundamental consideration and root of the whole art of lighting depends on having only one single aperture in the wall, so that the direct rays may all enter parallel, and not in conflicting directions. In artists' studios you will always find this rule carried out, and I will now attempt to explain the reason for it. Let us suppose you have to draw a portrait. A single high-light on the head involves a shade in exact proportion to it which you, as a draughtsman, can supply without any chance of error. The cast shadow likewise will have a known, well-defined and inevitable relation to the shade. The simplicity of light and dark enables you easily to grasp the form, and to appreciate its undulations without uncertainty or confusion; whereas, if you have two sources of light allowing rays to enter in two different directions, not only will you get on your model two high lights in inconvenient rivalry, but all your shades will be complicated and put out of their normal relation to their lights. The unity and simplicity of one shadow will be marred by the intrusion of another, and the result will be that your apprehension of the real undulations of the surface and the beauty dependent on them will be hindered, and considerable spaces of the surface will have no meaning for you—the beauty revealed by one ray of light being neutralised or blotted out by others proceeding in a different direction, so that the seeing is very considerably impaired, and the form shown at disadvantage. This is one important argument in favour of establishing only one inlet of light in each room. But there is another argument even more important, because it affects not merely the form of an object, but also its colour and texture; in fact, it fundamentally affects your seeing power. The subjective effect of cross lights is to diminish the pupil of your eye, thus curtailing absolutely your physical power of vision. In order to use all the seeing power that nature has provided you with, it is necessary that the light should reach your eye *after* having illuminated the object you want to look at; and, further, that the pupil of your eye should be encouraged to open to its full size by being shaded from the glare of direct rays. As all architectural structures have upright walls, such as are very convenient to look at, it is important that they should be well flooded with daylight, so as to show such pictures as you have; and next, it is advisable to economise those walls as fields of beauty, and not carelessly cut them up by chasms for doors or fireplaces. Seeing that your house is not to be a mere shelter, or casual ward, but an intellectual preserve, it is worth while to relegate such interruptions of wall-space as far as practicable to the corners. I know that there is nothing more

painful to the soul of the modern architect than a blank wall, and that sleep for him is impossible until he has broken through and destroyed that invaluable area of repose. So mad does it make him that he has been known to build in unnecessary pilasters in order to divide it up. I will venture to remind him that the impressiveness of a building from the outside largely depends on great unbroken areas of wall, and that these may be well studied in Mediaeval fortresses, which are admitted to be the most picturesque structures existing in Europe: take, for instance, the castle of Ivrea in Piedmont. It may be taken as a general principle that any architectural design that is so complete in itself as to forbid the intrusion of the subsidiary arts is not adapted for a dwelling-house. I know a man whose house was finished by Owen Jones. He is very fond of pictures, but has to keep them piled up in stacks for fear of spoiling his walls. We have now arrived at one well-defined and very important rule, which is that the daylight should be admitted to a room on one side only. That part of a window which is most valuable is the top half, as it admits most light per square foot. The lower part only admits light reflected from the earth, and more or less coloured; therefore, roll-blinds from the top should never be allowed. Any other form of curtain is less mischievous, but a roll-blind should be fixed at the bottom. In a well-lighted house the windows are carried right up to the cornice. Window heads, whether traceried or lancet, may be admirable, but should be reserved for other buildings where people do not dwell. If you ask yourselves the question which rooms are pleasantest of all those you have known, only one answer can be given, and it will be this: Those rooms are pleasantest in which work is done. Few would reply, "Those from which you have the best view." The man who would say so must be one whose home is sad, solitary, and unlovely; whose memories are the only beautiful visions on which his thoughts can linger. How often do you resort to your window with relish and turn away from it with reluctance? In your town experience I may confidently reply, "Never." If you decide the question by the suffrage of all the fairly cultivated men and women you know, I think the vote would be given in favour of the painter's studio, which has either a skylight or a window too high to look out of. Few, even amongst women, would vote for the drawing-room. It does not usually fall to the lot of gentle-folks to spend much time in workshops, but if you have a wide experience you will cherish the remembrance of the days you have spent with the goldsmith, the blacksmith, or the carpenter, and none of those shops were lighted by architects, none of them had any outlook. If you would rather look out of your nest than into it, then must your life be sad indeed, and you had better get away into the wilderness, or to the top of the Hindu Kush. There is in the city of Timbuctoo a great town house which illustrates nearly all the blunders that can arise from ignorance of lighting. The Sheikh is a man of the utmost good nature and nobleness of soul, and takes pleasure in his splendid possessions just in proportion to the number of intelligent men who will share their enjoyment with him, so I surmise that some of you have been his guests. He has a collection of pictures of first-rate importance, but his ingenious architect has so contrived the interior that hardly any of them can be well seen. The value of some of the pictures is so great that a very few of them would cover the cost of the whole building, yet many of them are condemned to blush in dark corners in order that the architect should indulge his childish taste for symmetry. The principal suite of rooms face the south, and are all lighted in the orthodox way, viz., on their long sides. The opposite long walls do not afford any good lighting, because your own shadow and the shine on the pictures conspire to render them invisible; and the gigantic fireplaces occupy about a third of the area even of these walls. The only well-lighted spaces that the plan allowed were the short walls that stand north and south. These he had wantonly and ruthlessly wasted by opening a vast doorway in the middle of each of them big enough for the gate of a city, and so the design was finished. Many architects would be surprised if they knew how fine an effect is produced by entering a room at the corner instead of at the side. It must be very unusual, since I do not

know more than two or three instances of it. Its charm depends on the varied angles under which the walls present themselves to the eye when you enter, as all of them are seen under oblique instead of parallel perspective, and the suggestion is conveyed that you should go on and prosecute your researches in the ramifications of the structure. You are not confronted by a flat opposing partition right across the line of advance. All deviations from mere symmetry are dear to the soul of the artist because they give occasion for composition—that is to say, the creative faculty—and if there were no other reason for placing a window out of the centre of the wall, this would be sufficient; but as a matter of experience many reasons for doing so are not far to seek. There are instances in which one whole wall is filled in with glass, and with excellent effect. There is one in a house at Putney very near my own built by Mr. Waterhouse. It is the window of a fine staircase, the other whole walls of which are well lighted and well adapted for pictures; but, alas! the use of stained glass in the window has put this out of the question; and instead of an intellectual feast of fine art, you are indulged with some admirable colour and design in the glass itself, but the walls are wasted. Let us now turn our attention to the second division of our subject, and determine how to deal with the daylight when we have let it in. This important question is too often shirked by the architect, and shuffled on to a scapegoat called the decorator. This pernicious person has the power of doing immense mischief at small expense, so he does it with no niggard hand. For a concrete example, let us refer back to the great house in Timbuctoo. The picture-show begins at the dining-room, the walls of which are covered with a rich stamped leather of dark maroon and gold, affording a fine background both for pictures and guests. The decorative mind was just able to grasp this principle, and, knowing there was "nothing like leather," he carried it right up from floor to ceiling, absorbing that part of the wall which is too high above the spectator to be serviceable as background, and destroying its power of reflecting light, which is the only function it could have fulfilled, and would have fulfilled with admirable effect if its surface had been tinted with tempera or an ordinary wall-paper of a cream colour. The ceiling, as usual, is cut up with mouldings and colouring of senseless pattern; but even if it were well designed, he would surely be an odd sort of visitor who would turn away from Vandeyck or Sir Joshua Reynolds to gaze at the ceiling. A few six-penny buckets of whitewash expended on that ceiling would have redeemed the room, and proved that it belonged to an intelligent human being. There are two different conditions under which light can be reflected. They are known in optics as whole light and scattered light. Whole light advances in one direction only. An ordinary plane mirror reflects whole light. Scattered light proceeds in all directions at once, and cannot be focussed by the eye so as to show images. Such is the light reflected from any granulated or dead surface, such as tempera, snow, or sand. If you require a polished surface to reflect light into a dark corner, it will fail to do so unless it is placed at exactly the proper angle, whereas a scattering surface will be efficient at any angle. All surfaces that are not strictly required to do duty as backgrounds should have a scattering surface, so as to diffuse the illumination, and the lighter their colour the more efficient they will be for this purpose. In Italy, unfortunately, there is more or less good art displayed on the ceilings of the great houses. All men who have seen it will agree that it could not have been more foolishly misplaced, or more effectually wasted. An excellent reflector of scattered light is a white linen cloth. Your architect will gladly provide you with good shelter, where a horde of menials can eat and sleep comfortably at your expense. Viollet-le-Duc is careful to go further, and provide that you shall look out on the prettiest view, but he calmly assumes that you are sure not to have anything inside your house so well worth looking at as the houses or shrubs opposite, and the historical conclusion of the whole matter is that in the reign of Queen Victoria, in nine great houses out of ten, any kind of art is out of place, for the simple reason that the architects have misused the daylight and wasted the wall-space. One word more has to be spoken as to the use of stained glass, and it is this: If you wish to

indulge in stained glass, you must make it your one and only form of colour-decoration. You can have superb colour in your window, but you take away its usefulness as a source of light, and make it an object to be looked at, and when you have looked at it your eye is unfitted to see any other colour. Even the splendid tints of Eastern embroidery or carpets cannot stand the competition; white light is absolutely necessary for the display of their beauty. Mr. Burne-Jones lately designed a beautiful picture, and Mr. Morris worked it in tapestry for the glory of the chapel of Exeter College. Some ingenious person has placed it on the same wall with a gorgeous stained-glass window, and opposite to another, so that none of its fine colour can be seen. The colour of your reflective surface is only one degree less important than the colour of your window-glass itself. A few years ago nearly every reception-room in London was papered with a dull sage green—a sad emphasis to lay on the depressing climate we have to live in; but a good man and a friend of mine was responsible for it. I am afraid you will think I display an unreasoning animus against the architect, and that I have spoken rashly and at random as to his ignorance of the use of daylight. But that is not so. There is an institution in which I lately offered to endow a prize for the best design for a house in which pictures could be well seen without a special gallery constructed for the purpose. The Council were pleased with the idea, but scoring my modest £25 a year, made it into a handsome £200. Two or three distinguished architects were appointed to judge the competition, and they actually awarded the prize to a design which afforded not one single well-lighted wall in the whole structure; and yet none of them were aware that they had done anything ridiculous! There is a good deal to be said as to skylights in lighting the dwelling-house, but you have probably heard more than enough on the sacredness of the wall and the importance of one window. Allow me to suggest, in conclusion, that these matters are worthy of your most serious study.

Mr. PAUL WATERHOUSE, in proposing a vote of thanks to Mr. Brett, remarked that his paper had raised many points on which differences of opinion existed, and it would be paying the deviser of such an architectural bombshell a poor compliment to acknowledge it with a mere "Thank you." Mr. Brett's theory that any arrangement of windows might be made into a satisfactory elevation for a house was liable to be misunderstood. In one way the lecturer had done them good service, in warning them against placing works of art exactly opposite a window; an instance of the killing effect of this disposition on pictures could be seen in the gallery at Hampton Court Palace containing the Mantegna pictures, for it was impossible to see them properly owing to the glare of light. Mr. Brett laid down the rule that there ought to be only one source of lighting for a room, and that the wall-covering ought to be selected with a view to the display of works of art; but, personally, he was inclined to doubt whether he was quite right. A large room with only an end window was insufficiently lighted for the comfort of most of those who occupied it. The lecturer had also shown too little regard for the views to be obtained from windows—there were plenty of windows even in London from which it was very pleasant to gaze. Most architects, too, would be sorry to see the decorated ceilings, say, of the Adam's period, obliterated with whitewash. As to the lecturer's strictures on symmetry in the house, while architects were doubtless too anxious to preserve symmetry at the cost of comfort, it was more desirable that regularity should be studied in a town house than in one in the country.

Mr. E. WOODTHORPE seconded the vote of thanks, but said he could not agree with much that was advanced. Direct light on a picture or the human countenance might give the most perfect definition, but the effect of diffused light was more pleasant and natural, and the fact that people looked their best when seated at dinner, with a white tablecloth before them, or behind footlights, was proof of this.

Mr. SIDNEY VACHER thought Mr. Brett had looked at his subject too exclusively from the standpoint of the painter of easel pictures. The first requirement in a dwelling-room was that it should be cheerful to live in, and this was not obtained if the apartment were a mere parallelogram, lighted from one end in order to illuminate

some easel pictures on perfectly plain wall-surfaces. He agreed with Mr. Brett that stained glass should not be introduced into a living room, except, perhaps, where an objectionable outlook had to be shut out.

Mr. MATTHEW WEBB, as a painter, agreed with much that Mr. Brett had advanced, and certainly felt that pictures in dwellings should to some extent be isolated, and not jostled together, as at an exhibition. The ideal treatment would be to decorate the walls themselves rather than to hang easel works. He believed that the museum collection of pictures had gone too far, and the extension of the system would be, he thought, disastrous to art.

The PRESIDENT, in putting the vote of thanks, said they had invited Mr. Brett as a painter to give them his views on house planning, and he thought their guest had let architects off very lightly. Mr. Brett must remember that in planning a house an architect had not a free hand, but had to meet his clients' wishes and requirements. The client really liked to see what view there was from the window while sitting down, and this meant that windows should begin near the floor level. If architects also carried out Mr. Brett's suggestions, and carried their windows to the highest practical level, so as to get top-lighting, the windows would be quite unmanageable in proportions, and difficult to harmonise with any elevation. The suggestion that roller-blinds might be fixed at the bottom, instead of the top, was a practicable one, and could sometimes be adopted with advantage.

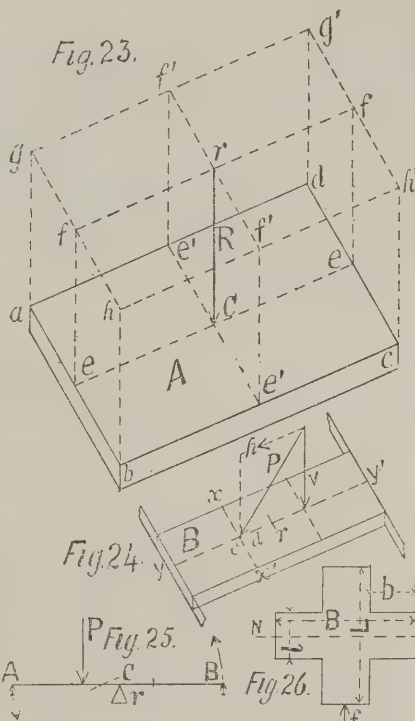
Mr. BRETT, in acknowledging the vote of thanks, said some of the objections that had been raised to his paper would not have been raised if, instead of hearing it, members had read it in the professional papers, and had taken time to consider the points. If Mr. Woodthorpe had studied portrait painting, he would know that cross-lighting was not desirable on a face; which looked at its best under direct lighting. Mr. Vacher had objected to easel pictures, and so did he; but as people changed their houses, and yet wished to keep their paintings, it was necessary that works of art should take this form.

STABILITY OF WALLS ON SOILS.—IX.

Demonstration of Static Action of Loading on Foundation Base.

WHEN a comparatively rigid plane, as the lower surface, a, b, c, d , of the horizontal flagstone A (Fig. 23), is pressed vertically against a compressible substance underlying it of uniform density, such as a foundation soil, the distribution of the component parallel forces, making up the sum of the entire pressure, is assumed to act in one or more parallel planes, normal to the surface so pressed, and longitudinally or transversely to its rectangular sides. The orthographic projection of typical parallel planes of uniform pressure is shown normal to each other by $eeff$ and $e'e'f'f'$, standing upon the centre intersecting lines, ee and $e'e'$, of block A. The vertical arrow cr in the central intersection of these normal planes represents the position of the axis or centre of pressure R, through which the entire vertical force is assumed to act. The normal ordinate at any point in the central axis of the plane A represents the intensity of pressure at any such point along ee or $e'e'$. Then, since the ordinates at e and e' at each end of ee , the longitudinal centre axis of the horizontal plane A, are equal, and all intermediate ordinates being likewise equal, the area of the rectangle $eeff$ represents the entire pressure acting in the vertical plane $eeff$. All these ordinates being equal and equidistant, the pressure is uniformly distributed throughout these normal planes. The vertical pressures along the transverse central normal plane $e'e'f'f'$ are likewise uniformly distributed, and so likewise are all the vertical pressures within the normal planes contained in the cube $gaabb'c'g'd'$. When an inclined force as P, Fig. 24, presses in a normal longitudinal plane upon a horizontal plane, B, it may be resolved into its normal components in the same plane, i.e., one part of the force acts in a direction perpendicular to the plane B as arrow V pressing it downwards, and the other parallel as h , tending to slide it in the direction of the arrow along the surface of contact in the line yy' . The relative proportion of these component forces are represented, according to the principle of the parallelogram force, by the alternate sides of the parallelo-

gram $h V C$, by the same scale of measurement to which the oblique force P is drawn. By the principle of the equality of pressures along a longitudinal vertical plane just demonstrated the pressures at all points along xx' are equal to that which is assumed to act in the centre vertical plane standing on the transverse axis yy' of the block B. The resultant r of the uniform reaction is in the geometrical centre of the plane B, therefore the point c of application of the pressure P has a deviation from the centre r of the distance d , from r to c . When the point of application c , in which the central force p , Fig. 25, intersects the horizontal surface denoted in section by A, B, such as that perpendicular to the plane of the paper, is not in the geometrical centre of the base C, the pressure is unequally distributed over the horizontal surface. By the



method of moments, the reactionary forces are inversely as their leverages on either side of the centre of pressure C'. The two opposite equal and parallel forces applied at c' and r respectively, the second r tending to balance it equally at the centre c , and the first p tending to overbalance it by depressing the end A, create a static couple having an overturning tendency.

Essential Conditions of Stability of Tall Masonry Structures against Lateral Force.—1. The pressure at the leeward edge of a bedjoint should not exceed the safe crushing resistance of the weakest of the materials composing it—i.e., usually the mortar (see Resistance of Materials to Crushing). 2. There should be no tension or uplifting in the windward edge of the bedjoint. Note.—In order to secure this:

For Important Structures.—The centre of pressure must be confined within the middle-third of the base, or width of joint.

For Unimportant Structures.—The middle half is sometimes taken, as in semicircular arches symmetrically loaded, garden inclosure or boundary walls, &c. 3. The resistance to lateral sliding or shearing in a joint must be greater than the sliding or shearing force, by a safe margin.

Resistance of Materials to Crushing.—In order to obtain stability, the materials composing the masonry structure should safely resist the maximum splitting, cracking, or crushing force to which the moment of wind pressure may subject it, in addition to the gravity loads of the superstructure. The following safe crushing strengths will be convenient:—Portland cement mortar, 1 to 2 of sand, 10 days old, 80lb. per square inch; 20 days, 100lb. per square inch; 30 days, 116lb. per square inch. Portland cement mortar, 3 sand, 10 days old, 40lb. per square inch; 20 days, 49lb. per square inch; 30 days,

59lb. per square inch. Portland cement mortar, 4 sand, 10 days old, 22lb. per square inch; 20 days, 27lb. per square inch; 30 days, 33lb. per square inch (these are $\frac{1}{10}$ th of ultimate strengths of good grades). Portland cement concrete, 1 to 5, $1\frac{1}{2}$ cwt. to 2cwt. per square inch; Portland cement concrete, 1 to 10, $\frac{1}{2}$ cwt. to 1cwt. per square inch; lime concrete, or mortar, $\frac{1}{2}$ cwt. to $\frac{1}{2}$ cwt. ($3\frac{3}{4}$ tons per foot) per square inch; bricks, ordinary stocks, $\frac{3}{4}$ cwt. per square inch; brickwork, laid in cement mortar, $\frac{1}{2}$ cwt. per square inch; brickwork laid in lime mortar, $\frac{1}{2}$ cwt. to $\frac{1}{2}$ cwt. per square inch; masonry, rubble, lime mortar, $\frac{1}{2}$ cwt. per square inch. Building stones: Limestone, granular and crystalline, 8cwt. per square inch, soft 3 to 4; sandstone, common, 4cwt. per square inch; granite, Aberdeen, Cornish, Guernsey, 10cwt. per square inch. For recent tests of the crushing strength and other properties of building stones see Prof. Beare's paper in the BUILDING NEWS, Vol. LXII., pp. 726, 727.

Notes on Portland Cement, Tests, &c.—J. Grant's experiments led him to the conclusion that the tensile strength of Portland cement is about one-twentieth of its crushing strength; but J. Bauschinger states he has found no such fixed relation between these strengths. Cement having large tensile strength soon after setting, has a large percentage of lime in its composition, which causes injurious expansion in work. Fineness of grinding increases the tensile strength by one-half between the ground state and that passing the finest sieve, without the residue. Scantiness of water in mixing reduces the crushing strength. Thus, cement 1 to sand 3, and 20 per cent. water, gave, at 28 days old, 1,679lb. per square inch; but 10 per cent. water gave 1,425lb., or between one-sixth and one-seventh less, whereas for tensile strength there is an opposite effect. Thus 25 per cent. water (7 days old) gave 195lb., and 16 67 per cent. gave 432lb., or about $2\frac{1}{4}$ times of increase. The increase was gradual for intermediate percentages of water (Proc. Inst. C.E., pp. 54, 106, 107, Vol. CVII.)

Coefficients of Friction in Masonry Joints.—Brickwork laid in slightly damp mortar, .74; hard brickwork laid in slightly damp mortar, .70; common brickwork in wet mortar, .47 to .50; well dressed granite in wet mortar, .50; hard limestone in moist mortar, .65.

Slender Pillars of Brickwork.—Where piers are introduced in the structure a sufficient reduction of the intensity of the permanent load should be made, according to the ratio of the height to the least side, and the sufficiency of bond blocks used at proportionate intervals, the character of the workmanship, &c. Full section bond blocks should be placed at 3 to 5 diameters apart. The higher the pillar, the less the number of diameters the bond stones should be apart. Their relative number also depends on the intensity of the unit load, the importance of the duty performed, permanent character of the structure, nature of its occupation, exposure to accidental forces, &c. Piers supporting contiguous arches springing from them have their effective horizontal section for supporting the superstructure reduced to that only lying between the ends of the extradoses or top edge of the skewbacks of the contiguous arches.

Wind Force: its Nature.—The pressure exerted on structures by wind force, tending to destroy their stability, acts as a live load with momentary variations in force and direction, being influenced greatly within a certain range of altitude by topographical features and local structural surroundings, which often occasion more or less obliquity of action in producing either an ascending or descending current and eddies. The most danger to small, tall structures is to be apprehended from sudden gusts of great intensity, which produce double the effect of a static force. The Board of Trade's committee rules, reported May 20th, 1881, require in the estimates of stability of railway bridges and viaducts an allowance of 56lb. per square foot of vertical plane or lattice surface directly exposed, besides an addition of 28lb. or 42lb. for the portion of the leeward lattice girder below the rail level and above the tops of carriages when the open spaces do not exceed two-thirds or three-fourths respectively of the whole vertical area within its outline, and 56lb. when the open spaces exceed three-quarters of the entire outline. The factor of safety to be 2 when the exposure is counteracted by gravity alone. In

all other cases the factor is to be 4. Pressure on arches and piers to be computed in conformity with the above. Mr. Thomas Hawksley, C.E., F.R.S., &c., in a communication to the British Association, 1st Sept., 1881 [Reports, p. 480], considered that even 40lb. per square foot has never been experienced in this country within the range of the altitudes of existing structures.

Measure of Velocity and Pressure.—The highest wind velocity recorded of the gale of Nov. 11, 1891, was 62 miles per hour, at Falmouth. At Ben Nevis, the loftiest summit in Great Britain, whose elevation is 4,406ft. above sea-level, with a cliff of 1,500ft. high on the N.E. side, 120 miles an hour was recorded in the same gale. Mr. Dines (Report in *Quarterly Journal* of Royal Meteorological Society for July, 1892, p. 180) states that during the same gale he found the pen of the pressure-plate jump from zero to 60 miles an hour in less than half a second. Gusts of 30 to 40 miles at momentary intervals occur in every gale. The pressure-gauges erected at the Forth Bridge recorded in the storm of Feb. 9, 1889, 27lb. per square foot on 193sq.ft., and 41lb. per square foot on 97sq.ft., tending to show the intensity of pressures to be inversely as the areas.

These velocities were computed with a co-efficient of 3 on the false assumption that the cup centres of the anemometer move with one-third of the velocity of the propelling wind. They are hourly runs, presumably, which consequently minimises in the record the effect of the violent gusts by absorbing them in the hour's run in which they occur.

It is only when the anemometer has a self-recording time attachment, whereby the ordinates of the fluctuations of the velocity curves, automatically traced, can be measured, that any adequate knowledge of those high-wind gusts, which are really the most destructive to architectural structures, can be attained. These average velocities and the pressures deduced from them are very misleading for computing problems of stability to resist wind pressure.

Anemometer Velocity, Factor.—The factor representing the velocity of the wind propelling the cups is usually taken at 3, but a series of experiments by Mr. W. H. Dines for the Royal Meteorological Society has discovered that 3 is too high, and recommending that 2.10 be substituted for the 3 factor, as he finds that for a steady wind 2.27 is the nearest value, but for a gusty wind 2.00 is the most correct. *Quarterly Journal*, July 1892, p. 182.

Pressure deduced from Velocity.—The pressure = .005, velocity² × surface area. Messrs. Whipple and Dines recommend to be substituted for the New standard pattern of revolving cup anemometers .0029 instead of .005, and Prof. Marvin, U.S. Signal Service, having regard to the fact that the wind pressure is proportioned to the density of the air, adopts .004 representing a barometric pressure of 30in. The co-efficient .005 is generally known as Smeaton's.

Point of Application.—The point of application of the resultant of wind-pressure is usually taken at the geometrical centre, or centre of gravity of the surface, thus allowing for a uniform distribution of the pressure, which, for ordinary height of structures, may suffice while using 56lb. as the co-efficient. But when using a lower absolute pressure the centre of pressure will be raised in proportion as the pressure at the top of a high structure exceeds that at the bottom. For a method of solution in this latter case see the *Building News*, 1877, Vol. XXXIII. p. 215.

Altitude Increases Pressure.—An appreciable increase of velocity and pressure occur with increase of altitude for heights of about 100ft. and upwards above the earth's surface. The Eiffel Tower, Paris, was designed to resist a wind-pressure of 41lb. per square foot at the base, and of 82lb. per foot at the top.

The anemometer records of wind velocity at 994ft. upon the tower ranged from two to five times those registered at the meteorological station, 69ft. above the ground, and 1,640ft. distant from the tower.

Overturning Wind Formula.—The force of wind acting on a tower or tall chimney resolves it into the condition of a vertical cantilever fixed at its base, as it were, by its weight, and loaded along its length by the wind pressure, which is assumed as equivalent to a concentration of normal pressure at the centre of gravity of the

exposed surface. Then, with the wind blowing, say, towards the right horizontally, the maximum pressure produced at the leeward side = weight of the tower, &c., above the base or a particular bedjoint, as the case may be, + the moment of flexure producing compression—i.e., the unit normal pressure of the wind × exposed surface area × vertical leverage of the centre of pressure above the bedjoint or base. The maximum and minimum pressures are expressed as follows:—

The maximum pressure, P per unit area, at leeward side

$$= \frac{\text{Weight above base}}{\text{Base sectional area}} + \frac{\text{Moment of wind} \times \text{length of section.}}{2 \text{ Inertia of the base section.}}$$

Minimum pressure at windward side

$$P = \frac{W}{B-S} - \frac{M}{2I}$$

These two equations are general for any form of section, inasmuch as the values of the moment of inertia I of the particular section in question must be introduced; and they are applicable to any system of vertical and horizontal forces. The moment of inertia of a section is a quantity depending only on the form of the cross section, perpendicular to the line of stress, and is an element in the moment of resistance, m. If f = intensity of the extreme fibre strain, and y = the vertical distance of the fibre from the neutral axis of the section, then

$$m = I \frac{f}{y} \text{ and } f = \frac{m}{I} y$$

= the maximum intensity of stress in the plane of the extreme fibres. The position of the safe limit of the centre of pressure for any form of cross-section, when the pressure vanishes to zero along the windward edge, perpendicular to the direction of the wind, depends on the moment of inertia of the cross-section. The deviation d of the centre of pressure from the centre of gravity of the cross-section for a rectangular section is one-sixth of the diameter, i.e., the centre of pressure must not be nearer to the leeward side or edge than one-third of the diameter. The moment of inertia of a section is the sum of the products of its elementary zones or strips parallel to the neutral axis, and the square of the distance of their centres of gravity from the neutral axis. The neutral axis is perpendicular both to the direction of stress and also that of permissible deviation.

Values of Moments of Inertia for the following Sections:—

l = Length parallel to direction of stress, as of wind.
b = Breadth perpendicular to ditto ditto.

Square, $\frac{\text{Side}^4}{12}$, whether the axis or diagonal is in line of stress.

Rectangle, $\frac{b^3 l}{12}$.

Hollow square or rectangle: $(BL^3 - b^3 l) \div 12$
BL denote outside dimensions, bl = inside ditto.

Circle (solid), Radius⁴ × .7854.

Ditto (hollow), (Outer radius⁴ - inner radius⁴) × .7854.

Semicircle, Radius⁴ × .1098.

Ellipse (stress along l), $(\frac{B}{2} \times \frac{l^3}{2}) \times .7854$.
l = long diameter, b = short ditto.

Elliptic ring, $[(\frac{B}{2} \times \frac{l^3}{2}) - (\frac{b}{2} \times \frac{l^3}{2})] \times .7854$.

Triangle, base (parallel to neutral axis) × perpendicular ÷ 36.

Greek cross (Fig. 26), $(BL^3 + 2b^3 l) \div 12$.
(Neutral axis N.A. f is a lateral force tending to turn the figure about its neutral axis.)

To obtain the moment of inertia for other forms composed of rectangular elements, the moment of each zone-rectangle about its own neutral axis = (its breadth × its length)³ ÷ 12. Then the moment of inertia of each zone-rectangle about the neutral axis of the whole form = moment of inertia about its own neutral axis + (its area × distance² between neutral axis of zone rectangle and that of the whole form).

Deviation of Centre of Pressure from centre of Resistance.—The following are the limiting distances of deviations (d) of centre of pressure from centre of gravity and from leeward edge of maximum pressure in terms of diameter, or

side in the direction of stress, for usual forms of piers, chimneys, &c.

Rectangle or square $\frac{1}{2}$ diam. from leeward edge. Id.
Ditto (hollow *) $\frac{1}{4}$ to $\frac{1}{2}$ " " " "
Circle or ellipse (solid) $\frac{1}{4}$ " " " "
Ditto (hollow *) $\frac{1}{4}$ to $\frac{1}{2}$ " " " "

For a rectangular section B.S in the formulæ = lb, and I = $\frac{1}{12} b l^3$; since the moment of the wind M = total pressure H by height of centre of pressure above the base h. Then substituting these values in the formulæ—

$$P = \frac{W}{lb} + \frac{6Hh}{b l^2}$$

Since by the parallelogram of forces the wind-force H : weight, W : is the permissible deviation (d) of centre of pressure from the centre of gravity of the cross-section to h, height of the centre of wind-pressure above the base. Then, as the products of the extremes and of the means are equal—i.e., the wind-pressure H by height of its centre h = weight by deviation d. Hence, substituting these values in the last formula gives—

$$P = \frac{W}{lb} + \frac{6W \cdot d}{b l^2}$$

This formula requires only the most accessible quantities in a simplified form for solution in conformity with the principle of stability of the middle-third—i.e., the deviation (d) = $1/6 l$.

(To be concluded.)

THEATRES.—XIV.

By ERNEST A. E. WOODROW, A.R.I.B.A.

FIG. 1 is the plan of the grand staircase of the Grand Opera House of Paris. This staircase is one of the chief features of the building, and it occupies a space nearly as large as the auditorium. As is well known, M. Charles Garnier was the architect, and the building was erected between the years 1861 and 1874. In Fig. 2 is shown the arrangements of the entrances of another Parisian theatre—the "Châtelet"—built in 1861, from the designs of M. Davioud, the architect. The famous old theatre, La Scala, of Milan, is a marked contrast to the Grand Opera of Paris in respect to the magnificence of its approach staircase. (Fig. 3.)

There is a similarity in the plans in Figs. 4 and 5—the Grand Theatre, Bordeaux, and the Theatre Charles Félix, at Genoa. The former plan shows two levels, the latter the ground level only.

At the Theatre Royal, Turin (Fig. 6), the approaches are under the auditorium—an arrangement which is being adopted by the architect in the new Municipal Theatre, Amsterdam, the plans of which are reproduced in this year's volume of the *Transactions* of the Royal Institute of British Architects.

I have reproduced these series of plans to illustrate that theatrical architecture is not what it was, as far as this country is concerned, nor can it be where a national theatre is not supported by the nation. The plans speak for themselves. There is much, no doubt, that is grand and imposing in these plans; the careful student will also find that in detail there is, however, much that is defective, and sometimes even dangerous, in the planning. Although we may regret the departed grandeur, we may comfort ourselves with the thought that the modern staircase, "delivering directly into the street," is an innovation made for public safety.

To turn now to the rules and regulations governing the forms of staircases—I must leave the consideration of materials to the time when I shall have to describe the construction of the whole building.

The London County Council regulates the staircases in London theatres by this rule, which I quote now in full:—

"Every staircase for the use of the audience shall have solid square (as distinguished from spandrel) steps of York or other stone, or fire-resisting materials, to be approved by the Council, with treads not less than 11in. wide, and with risers not more than 6in. high, without winders, in flights of not more than 12 or less than 3 steps each.

"The treads of each flight of steps shall be of

* The ratios for hollows are approximations for ordinary and mill chimneys, towers with thin walls, &c. The limiting line of deviation, d, is perpendicular to the direction of the overturning force.

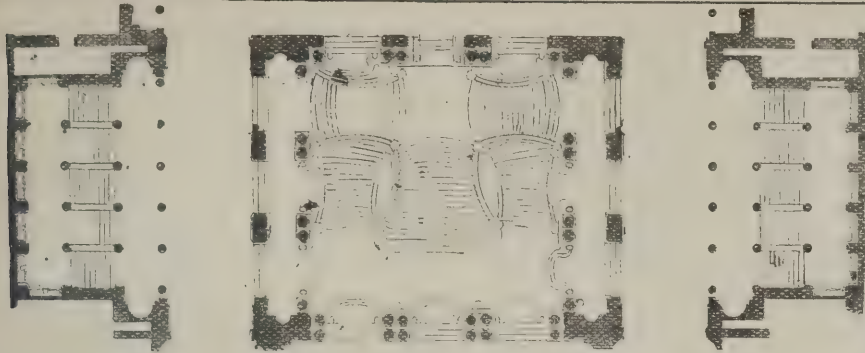


FIG. 1.

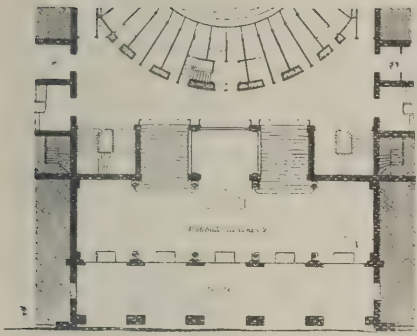


FIG. 2.



FIG. 3.

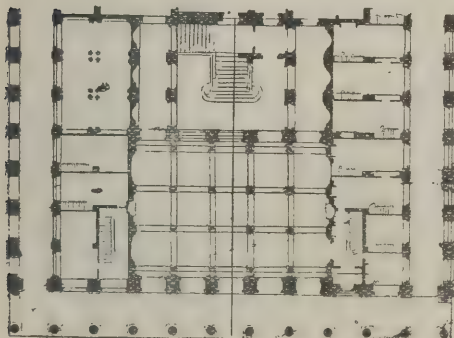


FIG. 4.

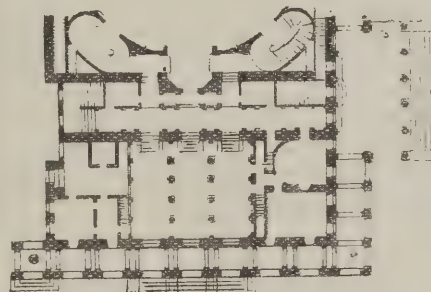


FIG. 5.

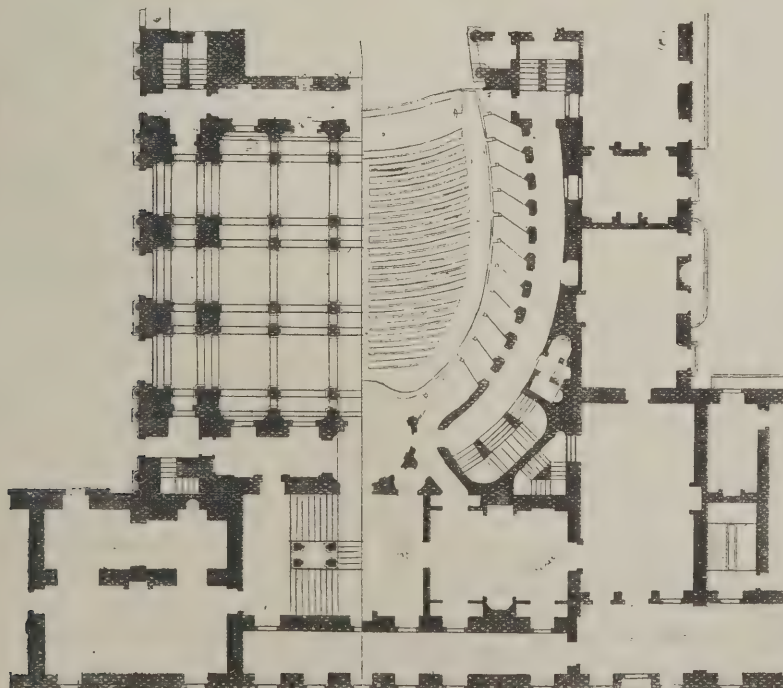


FIG. 6.

uniform width, and be pinned into brick walls at both ends.

"The several flights of such steps shall be supported and inclosed upon all sides by brick

walls not less than 9in. thick, to be carried down to the level of the footways.

"No staircase shall have more than two flights of 12 steps each without a turn.

"All landings shall be 6in. thick, be square upon plan, and have brick arches 9in. deep turned under them in the middle of such landings.

"Every staircase shall have a roof of fire-resisting materials to be approved by the Council.

"A continuous handrail shall be fixed on both sides of all steps and landings, supported by strong metal brackets built into the wall.

"Such handrails shall be chased into the walls, where the thickness of the walls will permit, but in all cases where the flights of steps return, the newel wall shall be chased so as to allow the handrail to turn without projecting on the landing."

I have already dwelt upon the various points which refer to the form or plan of the staircase which are detailed in this regulation, two other points, however, should be rigidly observed. The last flight of every staircase should be towards the street, and there should be an exit immediately facing the foot of each staircase. It will be observed that in the diagrams illustrating this article such an arrangement is not always carried out.

The staircases in Austria must be so placed as to be easily found, and close to the tiers or galleries; a provision, the benefit of which will be understood from the remarks I have made in my last two articles, when commenting on staircases; in London the rule is to have the exits, one on either side of the tier. The width required for staircases in Paris must not be less than 4ft. 10in., commencing at the highest level, which has to be increased in proportion on each flight to the number of persons using the staircase. This rule suggests that the staircase is entered at more than one level, which is certainly most undesirable, and sometimes even dangerous. A further rule confirms this belief, as it stipulates that every theatre shall have at least two staircases entirely devoted to the use of the audience, and independent of each other, and that these staircases shall communicate with each storey, and lead out into the street. This arrangement is not permissible in London, nor is it in St. Petersburg, for there it is enforced that staircases are not allowed which have direct communication between the corridors of the tiers or from the interior of the auditorium to the tiers.

These rules, however, should in no case prevent the formation of a "pass" staircase, to be used by the manager for the convenience of supervising the house; such a communicating staircase is also of the greatest value to the fireman, both in the performance of his ordinary duty and in cases of emergency.

In New York the openings to the staircases must be equal to the staircases themselves, and although the staircases must, as a rule, be inclosed in brickwork, the staircase to the first tier or dress circle, may be left open on one side, but in no case may a staircase be left open on both sides. When straight flights of stairs return directly on themselves a landing, as in London, of the full width of both flights without any steps must be provided, and stairs turning at an angle must have a proper landing at the turn without winders. In staircases where two side flights connect with one main flight the width of the main flight must be equal to the aggregate width of the side flights. The rise of the steps in New York may be 7 $\frac{1}{2}$ in. and the tread 11in. In circular or winding staircases the width of the tread in the narrowest part must not be less than 7in. There is undoubtedly a certain danger in "circular or winding staircases," and it is a matter of surprise that the New York regulations, which are otherwise so comprehensive and complete, should permit such an arrangement. In all the foregoing regulations handrails are stipulated as requisite on both sides of all flights of steps.

In a paper of mine printed in the BUILDING NEWS, 25th of last March, I said that I believed the abolition of the grand staircase was due to the custom of sinking the stalls below the street level, and placing the dress-circle on the street level. In the same paper I drew attention to the plan so frequently adopted by Mr. Phipps of placing two staircases passing one over the other within the same containing walls. This is a valuable economy of space. Diagrams of this arrangement were published in the above-mentioned issue of the BUILDING NEWS.

The city council of Glasgow accepted at their last meeting a portrait, by Sir Henry Raeburn, of the late Lord Provost Mills.

TWO EXHIBITIONS IN BLACK AND WHITE.

DURING the past few days two very different gatherings of examples of contemporary draughtsmanship have been opened to public inspection, and both, to the lover of artistic work, may be said to have very special interest, particularly to those who know how to use the pen or quill. The more notable of the two exhibitions is that held in Barnard's Inn Hall, Holborn, and consisting chiefly of the marvellous series of original drawings for Pablo de Segovia, by Daniel Urrabieta Vierge, the celebrated Spanish illustrator, who, working in Paris since 1869, first made a name in "Le Monde Illustré" and "La Vie Moderne," thereby actually founding, by his example, a new school of delineation, producing work full of freshness, vigour, and quaint humour as clever as need be, though few of Vierge's followers have been equal to his masterpieces. These are to be found, undoubtedly, in the famous designs with which he astonished the artistic world ten years ago, when Messrs. Bonhôte published the picturesque story of "Pablo de Segovia, the Spanish Sharper," by Francisco de Quevedo-Villegas. These are the drawings now on view in Barnard's Inn Hall, and Mr. Fisher Unwin, the well-known publisher, has just produced an English translation of the same romance, with enlarged reproductions of the original series, together with about twenty new pictures by Vierge, who, with great perseverance, has learned to draw with his left hand since the book first was issued, when a stroke of paralysis laid him low, depriving the artist of his speech and use of his right hand. The episodes in "Pablo" furnish endless subjects of the "Don Quixote" type, for the illustrator, with a variety of characters and questionable incidents; but the tale itself of the "Gil Blas" school, is exceedingly minor and quite unworthy of such masterly illustrations, in spite of the fact that probably the caricaturist would, with difficulty, obtain more serviceable material for his character studies. We can only mention a few of these, as typical of the remainder. The Dinner scene, where Don Alonso and Pablo are seated at the table of the wayside inn, while on their journey to the University, is a drawing which shows Vierge's power over facial expression and elaborate care in accessory detail. The contrast between the habits at the table of the common folk and the exquisite bearing of the superior person seated bolt upright, with his dinner napkin pinned down over the soiled tablecloth, is capably rendered. The artist's appreciation of architecture is often to be noted, as in No. 25, where the façade of the University of Alcala de Henares is drawn with great exactness and feeling. The Spanish iron grille, seen in No. 28, where Don Alonso's housekeeper is going to church, is another example. This drawing shows the great care of the draughtsman, such as in the fabric of the comic old woman's stiff stuff dress, and it shows, too, his capability of expressing, in the fewest lines possible, the utmost amount of character. Only the nose, and cheek, and mouth of the dame appear in profile in front of her bonnet, and yet how entirely complete is the study of her face; we seem to know her at once, with her airs, and her graces, and spurious piety. For drapery, take No. 62, where Don Jordon stands quaintly looking over his shoulder, and see how much can be indicated by pure outline. The designs are often overcrowded, and sometimes Gillot's reproductions were too much reduced to do the originals justice, as in 59, "The Melée in the House of Pablo's Uncle." The general effect, too, of some of the pictures is spoiled by the masses of black used in drawing a figure, say, in the middle distance, while those to the front are simply in outline, thus avoiding all attempt at tone or light and shade. Although probably the idea was to draw special attention to the central figures, the relative values of true perspective are lost. "The Pastrycook's Shop in Madrid" shows a picturesque street corner (73), and a quaint interior beyond the opening. In judging Vierge's studies, it must be remembered that the scenes are presumed to be seen under a southern sun, and generally the effect is conventionally brilliant to a degree, not to say dazzling, the shadows being treated capriciously as decoration. The exhibition includes some first-rate miscellaneous drawings of other subjects, such as the Painters, Plasterers, and Donkeys at the Paris Exhibition in 1889.

Turning from Barnard's Inn, we may visit briefly the gallery of Mr. Mendoza in St.

James's, where the annual Black and White Exhibition is on view. Somehow, and we hardly know why, the collection scarcely seems so interesting as usual. There are so few decorative subjects, though we noticed Mr. P. H. Miller's "Cupid and Psyche—Death of the Butterfly," drawn in red with much grace and breadth of drawing, if not with any great originality. Mr. Vincent P. Yglesias shows "The City of Lincoln," with the cathedral dominating the town, in an almost ideal fashion, with the minor towers and gables of the streets grouping round 'midst the mists of evening-time, which lend an enchantment to the view. Mr. J. Fulleylove, R.I., takes us to Warwick, where, from the roofs, he shows us a bird's-eye view of the inner ward now forming the well-known lawn in front of the great hall. The same artist exhibits "Mola St. Carlo," "Trieste," and "Capo d'Istria." Miss Marian Logsdail shows fresh drawings of very familiar subjects, such as "Desdemona's House," "The Grand Entrance to the Ducal Palace and the House of Gold at Venice." Mr. Percy Wadham brings us home to "Eton Old Courtyard," and Mr. A. G. Thomas gives a careful drawing of the "Old Poultry Cross at Salisbury." Miss Elizabeth G. Vawdrey, too, in a homely study, shows the old pents and exterior steps to the ramshackle houses in Pin's-lane, Plymouth, with an honest love of old buildings; but to the painter, and, of course, the magazine or newspaper illustrator, these will have but little attraction, where most of the works shown have been, at one time or another, prepared for such uses. Mr. Walter Paget can draw, and he does. His honestly worked-out scenes from "Robinson Crusoe," in a different way, may well compare with Vierge's studies of character and power over points of detail. Mr. C. Whymper shows the "Champion Skater," full on, in a foreshortened position, very difficult to render without loss of action. Mr. Alfred East, always a powerful draughtsman, shows "Naples," and Mr. Melton Prior a "Trout Lake from Nipissing, Ontario." Mr. Caton Woodville, as capable as ever, sends "Natives Diving for Coin, Aden," while Mr. W. L. Wyllie contributes "Southend Pier," "Irene" and "Innocence" are refined studies, characteristic of Mr. Henry Rylands, whose work is familiar to our readers; and Mr. G. C. Haité shows a brilliant little waterside sketch of a Surrey village, well suited for reproduction.

RIGHTS OF WAY.

UNDER the above title an interesting paper on the legal aspects of this somewhat complex question was read at the ordinary general meeting of the Surveyors' Institution, on Monday evening last, by Mr. J. Douglas Walker, Q.C.

The author, for practical purposes, classed rights of way under three heads—viz., public rights of way, private rights of way, and, for want of a better term, Parliamentary rights of way. The first, he said, had their origin in the dedication by the owner of the soil of so much of the surface of the soil as the road or way covers to the public for the purpose of passing or repassing. Everyone was entitled to pass over the surface without let or hindrance; but the use of the road for any other purpose by anyone not the owner was a trespass. The case of "Henderson v. Duke of Rutland," recently decided by the Court of Appeal, was not mentioned by the author, but will readily occur to our readers as confirming his statements on this point. So much of the soil and to such a depth was dedicated to the public (or the authority representing the public) as was necessary for the purpose of keeping the road in repair and laying any necessary pipes, sewers, &c.; but the ownership remained with the owner of the subjacent soil, to whom the right of minerals, &c., below the road exclusively belonged.

A private right of way was simply the privilege of passing over the land of another, and in no way conferred any ownership on the grantee, although he was empowered to repair the way and keep it in a fit condition for his use, on the condition that the owner of the land might use it in any way he liked as long as he did not interfere with the rights of passage. If a man, for instance, gave a license to lay pipes through his land to a cistern, the grantee might afterwards dig to mend his pipes, and the grantor might not do anything, in the way of building on the land or otherwise, which would prevent such

access to the pipes. But it must be observed that a right of way is a right to pass only from one point to another fixed point along an appointed line. If the way be out of repair the grantee may repair it, but must not deviate from it. The owner of land to which a right of way is appurtenant can convey the right to the purchaser of his land. A right of way may be acquired by prescription, for which enjoyment without interruption for a period of twenty years is necessary. The user must be continuous, and during the whole term sufficient to carry to the mind of a reasonable person owning the servient tenement (or the land over which the way passes) that a continuous right was being asserted and might, if necessary, be resisted. But the right could only be asserted for the purpose it was originally intended, and evidence of user for one purpose was not proof of the existence of a right of user for all purposes. The public were entitled, in the case of a public right of way, to the user of the whole width of a road between the fences; but the dominant owner of a private way was only entitled to pass with the convenience to which he had been accustomed for his accustomed purpose, and could not, therefore, complain if the servient owner narrowed or widened the road, so long as so much of the centre of the road was left as was necessary for his passage.

An action for obstruction of a private way could be defeated by showing that a public right existed before the alleged private right came into existence. If the dominant tenement—i.e., that possessing the right of way over the servient tenement—be divided, as in the case of building land let in plots, the law was clear that (without qualifying words) the right passed to each owner of each part of the severed lands; but the circumstance that the distribution of the right would materially increase the burden on the servient tenement might, under some conditions, be a very strong reason for inferring that such a distributed right did not exist.

A right of way by Act of Parliament combined, in some respects, the characteristics of a public and private right of way. A railway company could use the whole of the surface of the land between their fences, but they could not grant a right of way on any of the surface, except for the purposes of their Act.

A discussion followed the reading of the paper, in which Mr. G. M. Freeman, Mr. W. Wright, Mr. S. B. Saunders, Mr. T. W. Wheeler, Q.C., and Mr. P. D. Tuckett took part, and the usual vote of thanks terminated the proceedings.

CHIPS.

Mr. Arnold Taylor, an inspector under the Local Government Board, held an inquiry at the local board offices, Argyle-road, Sevenoaks, on Wednesday week, as to the board's application for sanction to borrow £1,500 for laying out a pleasure ground and for works of sewerage and street improvement. Mr. J. Mann, surveyor to the board, exhibited and explained the plans.

Major Isaacs, F.R.I.B.A., was entertained at dinner at the Bridge House Hotel, London Bridge, on Monday night, and presented with a testimonial, in recognition of his services as Conservative member of Parliament for the Walworth Division of Newington from 1885 to 1892. The testimonial took the form of a tea and coffee service and silver salver, accompanied with an illuminated address on vellum, the value amounting to 150 guineas, and the subscribers including about 1,130 contributors of a shilling and less.

The Accrington town council decided on Monday to apply to the Local Government Board for sanction to borrow £10,000 for the erection and equipment of a technical school, and for £10,000 to purchase land for, and the establishment of, a central electric-lighting station, and for £1,400 for the purchase of baths and wash-houses.

The corner stone was laid on Saturday at Swindon for St. Mark's parish. Plans have been prepared by Mr. W. Whincop, of Stoke Newington, for a building estimated to cost about £4,000; the church committee resolved to erect one section of the building first, and the contract was let to Mr. George Wiltshire, of Swindon, at £2,200. The building will be of brick with freestone facings, and have a frontage to Maxwell-street of 58ft.

By permission of the Society of Antiquarians, the large (17ft. by 8ft.) ancient painting on oak of "The Judgment," recently discovered in Wenaston church, will be on view at the rooms of the society, Burlington House, for a week from Thursday, December 15th, in the evening of which day a paper on the subject will be read by Mr. C. E. Keyser, F.S.A.

CONTENTS.

Unsolved Problems	797
Window Design	797
Royal Institute of British Architects	798
Architectural Association	799
Stability of Walls on Soils.—IX.	801
Theatres.—XIV.	802
Two Exhibitions in Black and White	804
Rights of Way	804
The Building News Directory	XIII
Our Illustrations	824
Wayside Notes	824
Obituary	824
The Blount Door Spring and Check	825
The Soane Museum Curatorship	825
Church Wall Decoration	825
Competitions	825
Architectural and Archeological Societies	825
Building Intelligence	826
Correspondence	826
Intercommunication	827
Legal	828
Legal Intelligence	828
Stained Glass	828
Water Supply and Sanitary Matters	828
Our Office Table	829
Meetings for the Ensuing Week	829
Trade News	829
Tenders	830

ILLUSTRATIONS.

WESTMINSTER ABBEY, NORTH TRANSEPT.—"FIRSDENE,"
BROMSGROVE.—"CHRIST IN THE MIDST OF THE DOCTORS."
—ST. PAUL'S CHURCH, ADDESTONE.—BUILDINGS IN
MAYFAIR.—LYCH-GATE, WRIBBENHALL CHURCH.—NEW
SCHOOLS, BROOK-STREET.—ST. PHILIP'S CHURCH, STEPNEY.

Our Illustrations.

WESTMINSTER ABBEY: THE NORTH TRANSEPT AS
RESTORED.

THIS drawing was exhibited at the Royal Academy last summer by Mr. John L. Pearson, R.A., the architect of the restoration, and it shows the new façade of the North Transept as finished a short time since from his designs. Sir Gilbert Scott, R.A., renovated the great portals. We gave a photograph of the new front on June 5, 1891, and the series of new statues by Mr. N. Hitch on April 10th of the same year. The autograph drawing of the transept, as altered by Sir Christopher Wren, was published by us, in fac-simile, on Oct. 26th, 1888, and a detail drawing of Sir Gilbert Scott's work will be found in the BUILDING NEWS for May 3rd, 1878. We have thus furnished so many particulars of this national work, that nothing remains here to add.

"FIRSDENE," BROMSGROVE.

THIS proposed house, designed to comply with definite instructions, is arranged on a very convenient plan, a special feature being made of the hall, in which a large bay window is contrived by the side of the fireplace, similar to those in the dining and drawing rooms. The complete set of general working drawings herewith reproduced show in detail the principal arrangements, one good point worthy of note being the isolation of the kitchen and offices by the introduction of a luggage-entrance, which really is the tradesmen's door. The walls of Bromsgrove stone in courses, with roofs covered with Colley Weston stone slates in scale with the rest. The chimneys are shown in brickwork. The general effect of the residence, as in old houses, depends upon its groupings and main proportions, the details being exceedingly simple. The staircase seems the least satisfactory part of the plan. Messrs. Bateman and Bateman, of Birmingham, are the architects.

"CHRIST IN THE MIDST OF THE DOCTORS,"
BY HOLMAN HUNT.

THIS glass mosaic work has been carried out as an altar-piece for Clifton College Chapel by Messrs. Powell and Sons, of Whitefriars, and is an exact reproduction of the celebrated oil-painting by Mr. Holman Hunt, the well-known painter.

ST. PAUL'S CHURCH, ADDESTONE.

A SUM of money having been bequeathed for the beautifying of the chancel of this church, it has been decided, in consequence of the disproportion of the present chancel, to entirely rebuild it in accordance with the design which we now illustrate, and which has been prepared by Mr. Theophilus Allen, F.R.I.B.A., of 3, Duke-street, Adelphi, and the work will be commenced as soon as sufficient funds have been subscribed.

BUILDINGS IN MAYFAIR.

AMONG the improvements and changes brought about in London street architecture during the last ten years, there is none more remarkable than the transfiguration of Mount-street, and it must be admitted that the Duke of Westminster, assisted by his surveyor, Mr. Eustace Balfour, is to be commended for the personal trouble he has taken, and the public spirit he has displayed in his successful endeavour to beautify this most fashionable quarter of London. Old smoke-begrimed Mayfair is gradually disappearing, and in its place is growing up a neighbourhood of picturesque streets. All these charmingly-designed buildings, whether they be shops, flats, or private houses, and which meet the eye at every turn, have in every case been submitted to the personal inspection of the duke before their erection, and his judgment in rejecting some designs and approving others is exemplified by the pleasing result. The buildings we illustrate to-day form one of the latest demonstrations of the vast strides London street architecture has made towards the picturesque. They are being erected by Messrs. Trollope, from the designs of Messrs. John Giles, Gough, and Trollope, and when finished, and the street completed, it will only then be able to appreciate the vastness of the improvement of the approach to Grosvenor-square from Berkeley-square, which till now has been a source of danger and difficulty. The whole block consists of eight private houses on a quadrant, now renamed Carlos-place, and a large building in Mount-street, with shops and offices on the ground floor, and four sets of self-contained flats over. The amount of practical thought and experience bestowed upon the planning of these flats is amply repaid in the result, as notwithstanding their size, and consequently high rental, they are already occupied, even before their actual completion. Each flat is self-contained on one floor, and is entered from a commodious staircase, with passenger lift into a large square-panelled hall, from which a wide corridor, 7ft. across, leads to all the principal rooms—viz., a smoking-room, 16ft. by 12ft., dining-room, 24ft. by 18ft., drawing-room, 24ft. by 18ft., dressing-room, 11ft. by 18ft., two bedrooms, 18ft. by 18ft., another bedroom and bathroom, and w.c., two servants' bedrooms, pantry, kitchen, larder, scullery, servants' w.c., wine and coal cellars, with service lift from basement. On the top floor extra accommodation is provided for men-servants, one room for each flat. The construction is fireproof throughout. The floors of the corridors and living-rooms are laid with oak, and the bedrooms with pitch-pine. The kitchens and offices have wood-block floors, and the walls are lined with white glazed tiles. The whole building is fitted with electric light, electric bells, and hot water. Decoratively and constructionally, it is as complete as possible. The houses are not in such a forward state, but several are already sold. Being "wedge shape," the difficulty in planning was not lightly overcome; but a satisfactory result has been arrived at by placing the entrance-hall front stair and back staircase on the "wedge" side, and slightly dovetailing one house into the next. The whole block, houses and flats included, is constructed externally in red brick, with Portland stone dressings.—J. E. T.

WRIBBENHALL CHURCH, BEDWLEY: LYCH-GATE.

THIS Lych-gate has lately been erected at the churchyard entrance of All Saints', Wribbenhall, which stands on the high road to Kidderminster. It is of oak, with shingle roof and wrought iron cross-finial. The cost was £90; the design by Mr. Thomas Gordon, Court Lodge, Sevenoaks; and the work executed by Messrs. Smith, of Broseley.

BROOK-STREET BOARD-SCHOOLS, CARLISLE.

THESE schools are the second of a series of schools that were arranged recently by the Carlisle School Board to be erected by their architect, Mr. T. Taylor Scott, F.R.I.B.A., of that city. They form a group of boys', girls', and infants' schools, all detached, and occupying an important site in the southern part of the city, almost in the centre of a rapidly rising locality of superior self-contained artisans' houses. Up to the present time the boys' and infants' schools have been completed and occupied, leaving the girls' school to be erected at the south end of the site, which will have a large playground and covered playshed, and out-offices along with the infants' school. The boys' school, on the west side of the site, has

a separate playground, with the caretaker's house overlooking it and part of the infants' school. Each school has been designed with a maximum of cubical and superficial area, and, having large windows and dual ventilation, the rooms are exceptionally cheerful and healthy, everything having been carried out with these objects in view. The schoolrooms, classrooms, and corridors are heated with hot air in addition to large open fireplaces, and the lavatory and all sanitary appliances are of the best and most modern description. The buildings have been erected with machine-made Cumwhinton red bricks, white polished Alnwick stone, and Westmoreland green slates, along with pitch-pine woodwork, stained and varnished, for the interiors. Arrangements are now being made by the Board for the erection of additional school accommodation at the western side of the city, in order to relieve the present overcrowded schools.

ST. PHILIP'S CHURCH, STEPNEY.

LAST week we gave the plan, elevations, and general sections of this large church. To-day we print a sheet of details illustrating the morning chapel, which forms one of the most elaborate parts of the building, with its central shaft supporting the graceful groining of the roof, which is contrived on a somewhat unusual plan. The drawings carefully show how this is managed in the sections, which are taken both ways. The spout from the piscina is one of the minor details about the church, which show the care taken by the designer over items which often are neglected. The drip to the spout is insured by the chase on its soffit. The orthodox plan for wastes from fonts, stoups, and piscinas, however, is that they should communicate directly with soakage pits in the earth, and not, as in this case, empty into the open air. Mr. Arthur Cawston, A.R.I.B.A., is the architect.

CHIPS.

The Charity Commissioners have just sanctioned a scheme for the removal of the Birmingham Blue-coat School from its present cramped and inconvenient site in the city to new buildings to be erected on a rural or suburban site, and to increase the accommodation from 250 to 400 children.

A presentation was made at Liverpool on Friday, at the offices of the engineer to the Mersey Docks and Harbour Board, of valuable silver plate to Mr. A. G. Lyster, assistant engineer to the Dock Board, in celebration of his approaching marriage, by the staff of the engineering department.

At a meeting held at Peterborough, on Tuesday, it was resolved that a fund be opened, to be called the Argles Memorial Fund, for the purpose of erecting a memorial to the late Dean of Peterborough in the cathedral.

The parish church of St. Lawrence, at Evesham, was reopened on Wednesday week, after having been restored and re-seated from plans by Messrs. Carpenter and Ingelow, of London. The stalls in the chancel are of oak carved by Mr. H. H. Martyn, of Cheltenham; those in the nave are of deal. The chancel has been extended 30ft. into the nave. The outlay has been £1,400.

A large timber fire broke out on Friday morning, the property attacked being situated at 59, St. George's-road, Southwark, and owned by Mr. G. F. Arney, timber merchant. The yard was 300ft. by 50ft., and the fire blazed for three hours with great strength. Fifteen steamers and two hydrants were set to work, but the greater part of the buildings and stacks was destroyed.

A board school in Great Junction-street, Leith, was formally opened on the 1st inst. The school board acquired Dr. Bell's School, and the building has been added to, from plans by Mr. George Craig, architect, of Leith. The school will give accommodation for 1,082 pupils, and the cost of the alterations and additions has been £8,000. Messrs. Kinnear, Moodie, and Co. were the builders.

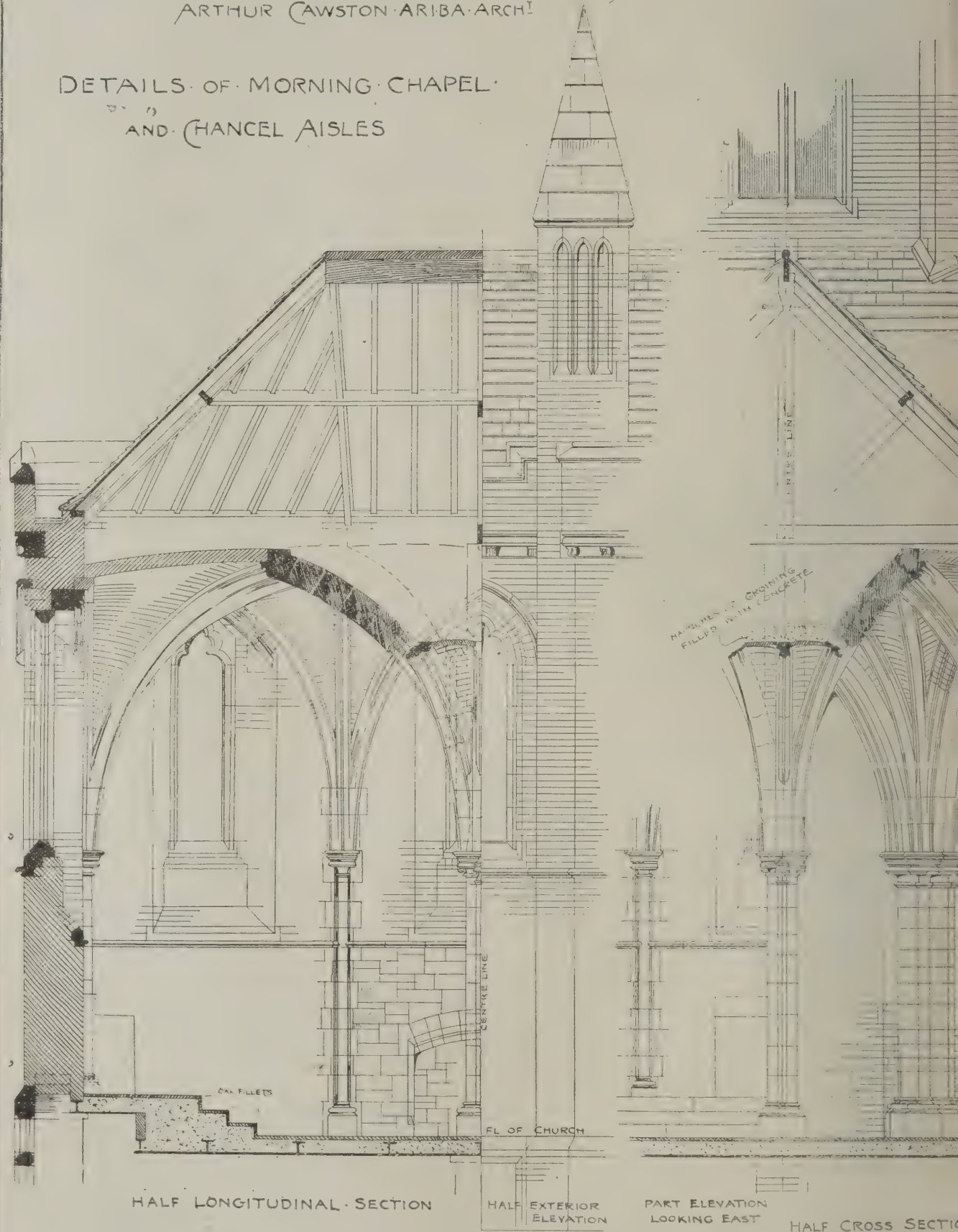
At a meeting of the electors to the Disney Professorship of Archaeology, held on the 1st inst., at Cambridge University, Mr. William Ridgeway, M.A., now professor of Greek at Caius College, Cork, was chosen to succeed Canon G. F. Browne, whose term of office had expired, and who did not seek re-election. The duties of the professorship consist of the delivery of six lectures during each academical year on the subject of Classical, Mediæval, and other antiquities. The stipend is about £100 a year. He holds office for five years, but is eligible for re-election.

A chancel has just been added to the little church at Cell Park, Markgate. Mr. J. Brown, of Luton, was the architect, and Mr. Dunham, of the same town, the builder.

ST PHILIP'S CHURCH · STEPNEY · E

ARTHUR CAWSTON · A.R.C.B.A. · ARCHT

DETAILS · OF · MORNING · CHAPEL ·
AND · CHANCEL AISLES



HALF LONGITUDINAL · SECTION

HALF EXTERIOR
ELEVATION

PART ELEVATION
LOOKING EAST

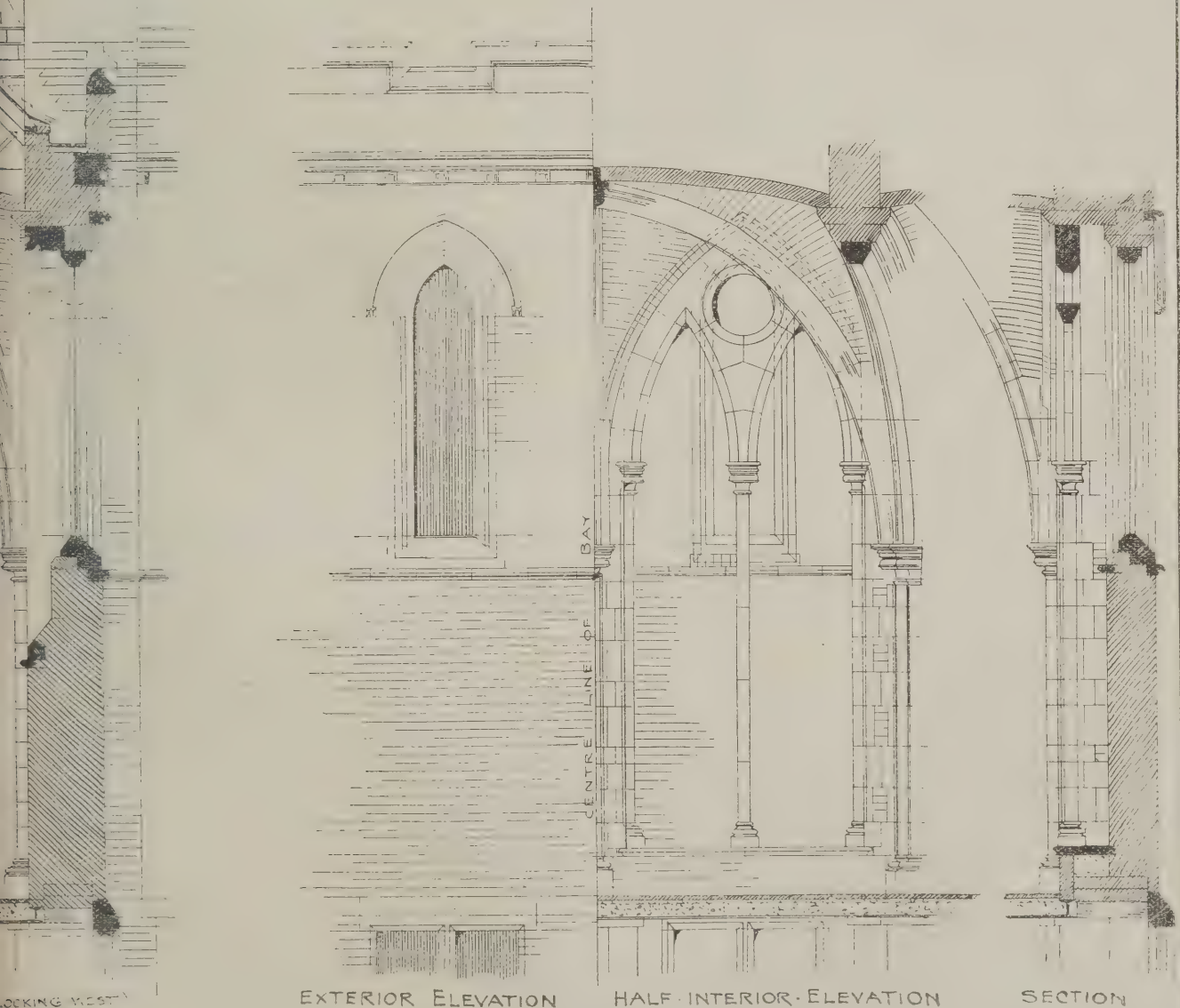
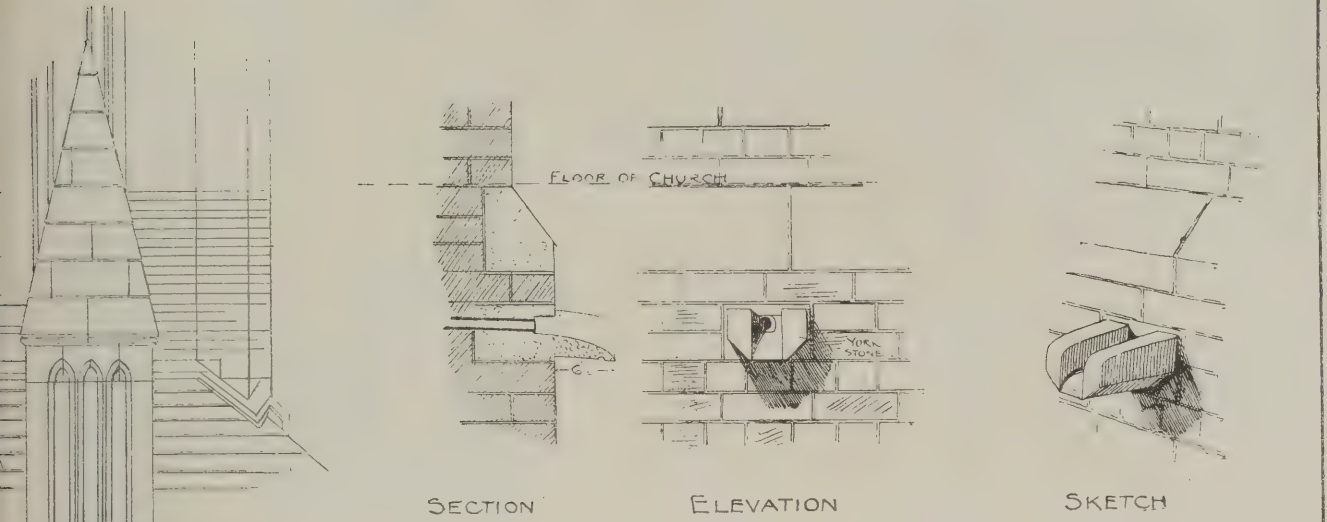
HALF CROSS SECTION

MORNING CHAPEL

E.C. DELS

INCHES 12 6 0 1 2 3

DETAIL OF SPOUT FROM PISCINA IN CHANCEL



BAY OF CHANCEL AISLES

WAYSIDE NOTES.

THE Panama business is a revelation. The disclosures made must have been unexpected in every quarter. Interesting will be the course of events herein.

We have the *Foudroyant* back again; much use will there be in the old hulk, cut down some 20ft. by the German ship-breakers who bought it for firewood and for what better purposes there could be found for the old timbers. Some individuals appear to have lost no time in connection with this matter. Prince Henry of Prussia, "among others," has, I read, had an entire suite of furniture made out of the *Foudroyant*, other German notables having a share in the timbers of which she has been shorn. In this way poop, spar-deck, and bulwarks have disappeared down to the level of the main deck. However, the syndicate who purchased this old line-of-battle ship seem satisfied with their bargain. Endeavours will be made to pass the vessel under the bridges, and so place her in the river in a suitable position for exhibition. If found impossible to pass her under the arches, she will be taken for exhibition to Greenwich or some other part of the Lower Thames. A restoration back to Nelson's days is contemplated.

As I anticipated, the decision of the Chelsea Vestry to do without an assessor in the baths competition has proved obnoxious to competitors. As certain architects are bound not to compete, and others will object to compete, there will not be a great display of talent in this competition. It is a pity that the commissioners could not obtain the information required. It seems a simple matter, and for the sake of the success of the competition I should advise further endeavours in the direction of appointing an assessor.

Another Roman villa discovery has been made—this time near Cambridge. In a field close to the road between Swaffham Prior and Reach, and near the Cambridgeshire "Devil's Dyke," the foundations of a villa have been unearthed. As usual, the most prominent feature in the discovery is the suite of hot-air bathrooms with their hypocausts, with the small tile pillars *in situ*. Samian pottery, tesserae, &c., have been discovered in connection with this find. It is said that the site and the nature of the findings bespeak a house of some importance, the lord of the manor at Swaffham conjecturing that the Roman military officer in charge of the north end of the Dyke may have been domiciled here. I am glad to hear that the public are permitted to inspect the works of excavation now in progress. In some other discoveries of this nature a boorish selfishness has been exhibited by those who have, or imagined they have, the right over the finds made.

The interesting old organ in St. Clement Dane's Church in the Strand is about to be restored. The instrument was built about the year 1690, by the celebrated Father Smith. From long-continued usage the instrument has become completely worn out. A sum of £900 is to be expended on its restoration.

It would seem a thousand pities to spoil Kensington Gardens by a new railway running across these open acres. To speak more boldly, it would be an abominable and disgraceful undertaking, and it is pleasant to note that there are persons actively opposing any proposal of this nature, even at this early date, when danger only threatens in a distant manner. Respecting the proposed Clapham Junction and Paddington Railway, Mr. W. Gardiner, chairman of the Paddington Ratepayers' Defence Association, is taking active measures to assist in the protection of the Kensington Gardens. Anything that destroys the quietude and beauty of these gardens is a national, not merely a local, loss.

To some persons it would seem a boon to working men to be able to travel from Edmonton, and other stations on the Enfield branch of the Great Eastern Railway, to London and back for the sum of 2d. That it should be a condition of such ridiculously cheap travelling that the traveller should be astir early in the morning would also seem but reasonable and just. Contentment, however, is not to be found here even, an agitation having been commenced for cheap

2d. trains arriving at Liverpool-street at 8 o'clock instead of 6.43. An equal concession at the other end of the day is demanded.

A fairer arrangement would be a charge of, say, 4d. to 6d., for trains up to 8 o'clock in the morning, the 2d. ticket being only for the earlier trains, as at present. In all probability, when the Great Eastern Railway Company have completed their new station works at Liverpool-street—now getting on favourably—they will go into the question of workmen's trains yet more fully. When the chairman of the company alluded to the new additions at Liverpool-street at a recent meeting of shareholders, he particularly stated that an extension of the system of cheap trains for workmen was one of the improvements contemplated when the present station was enlarged.

The photo-tint that you gave last week of the porch of St. Gilles Church, Caen, fine print though it is, scarcely gives the effect of this real architectural gem. As in many photos, the light on the portions of the building exposed to the light is quite lost, owing, possibly, to over-exposure of the original negative. It is the light, graceful character of the work about this grand old Norman porch that particularly strikes one coming fresh upon the scene. The true effect of the porch was given in a beautiful drawing by Mr. Herbert Railton in the *English Illustrated Magazine* for December, 1888. I have attempted a sketch of the work myself, but beyond getting a few notes of the charmingly *petite* detail that shows in your photo-tint, I did not make much of the job. It wants a master-hand.

Here is a high ideal, but a true and worthy one: "Life lies before us as a huge quarry before the architect; he deserves not the name of architect except out of this fortuitous mass he creates suitableness and durability; some form the pattern of which originated in his own soul." This may stand as a very good definition of a true architect.

How unprepared the London County Council is for the contemplated municipal building department may be at once seen from the suggested size of the staff to look after this proposed Works section of the Council's duties. The Council must swell out yet bigger before it attains to the large size and dignity which appears to be one of the principal, if not the chief, end and aim of its members.

I trust we may not have a hard winter this year, as much distress is threatened, and great hardship and suffering probable among the really poor. As far as regards the building trade, we get along all right until the bricklayers stop, and the other trades are hindered in consequence. Already frosts have caused temporary stoppages, and there seems an impression abroad that we may have frost of some duration. Those who give ear to an old saying with regard to berries and frost should believe that there will be very severe frosts indeed this season. Never have I seen more berries. They are in abundance on all trees and bushes in every hedgerow, and grow in masses in the winter woodlands.

"Taffy was a Welshman, Taffy was"—well, a promoter of competitions in which the architects who responded to his invitation certainly came off second best. The Royal National Eisteddfod of Wales has issued conditions of competition for plans, specifications, &c., of a pavilion for its next year's meeting, which are a trifle one-sided. The pavilion is to be erected on Ynysangharad (corner) Field, Pontypridd. The plan is to show, and the pavilion to contain, seats for 20,000 persons. A builder's estimate is to be sent with the design, for the amount of which the owner of the design (provided his design will be selected) will be bound to erect the pavilion. The names of two substantial sureties to be sent with the plans and estimates, who will enter into a bond jointly with the contractor, to erect the pavilion for the amount of the estimate and within the time specified. Plans, specifications, and estimates must be in the hands of Mr. H. S. Davies, hon. sec. Pavilion Committee, Town Hall Chambers, Pontypridd, on or before 1st January next. *The remuneration of the architect is to be included in the estimate, and paid by the builder, and the committee do not bind them-*

selves to accept the lowest estimate or any of the plans that may be sent in. I wonder how many designs the committee will get! GOTH.

OBITUARY.

DR. WERNER VON SIEMENS, the well-known electrical engineer, and younger brother of the late Sir William Siemens, died in Berlin on Tuesday, aged 76 years. Under the auspices of the Prussian Government, he invented and perfected various processes of galvanised gold and silver plating. He also devoted himself to constructing and developing the systems of electric telegraphy, the most important of the latter being the first great telegraph line on the Continent, that between Berlin and Frankfurt-on-Main, which he established in 1849. Six of the Atlantic cables, as well as many other submarine systems, were laid by Messrs. Siemens Brothers Limited, to the formation of which company Dr. Siemens greatly contributed. He was the inventor of the pneumatic-tube system, and, in 1867, of the dynamo, by which electric lighting has been rendered a practical possibility, and was also the first person to work out commercially the invention of electric railways.

The death is announced of M. Pierre Galland, who was born in 1822 at Geneva, his father being an artist and a master workman in gold. At eighteen he entered the *atelier* of Labrousse, and two years later that of the painter Drolling, working at architecture three days in the week and at painting the rest of the time. Galland wrought in the whole field of decorative design, painting meanwhile a number of portraits merely to gain a living. He gradually became known as one of the most accomplished artists of his time to the decorators then famous in Paris, and at the *Salon* of 1843 they united in designating him to organise the projected works. Galland would have risen quickly to fame in Paris had he not received an offer to decorate the interior of a palace which a rich Armenian was building at Constantinople. Galland accepted the commission, which occupied him during eighteen months. On his way home he studied in Naples, Rome, Florence, Venice, and Genoa. On returning to Paris, in 1853, he opened an *atelier* for himself, and since 1873 he had been Professor of Decorative Art at the Ecole des Beaux Arts, and since 1877 Director of the Gobelins.

CHIPS.

The Highgate Museum of Sanitary Appliances, established by the Hornsey local board, was formally opened by the Lord Mayor yesterday (Thursday) afternoon. The museum, which has been organised by Mr. T. De Courcy Mead, surveyor to the Hornsey board, was described in our last issue, p. 795.

Mr. Havard Thomas has prepared a model of the statue of Edmund Burke, which he is executing at the request of Mr. W. H. Wills for presentation to the city of Bristol. Burke is depicted as he is addressing a public assembly. The figure will be cast in bronze, and is to be 8ft. in height. It will stand on a granite pedestal about 10ft. high.

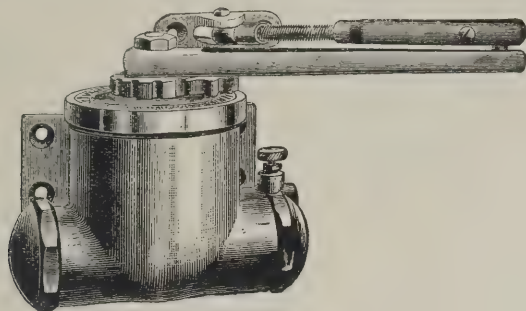
The two new branches for the National Provincial Bank of England at Hampstead and at Landport are both being warmed and ventilated by means of Shorland's patent Manchester stoves, with tiled sides, the same being supplied by Mr. E. H. Shorland, of Manchester.

A large illuminated turret clock has just been erected in St. Luke's Church, Kingston-on-Thames, with four 7ft. skeleton cast-iron dials, filled in with white opal glass; also an index dial in clock chamber, by which to adjust the outside hands, and an automatic gas apparatus attached to the clock for turning on and off the gas, all of which have been made and fixed by Messrs. Potts and Sons, of Leeds, who have in hand a turret quarter-chime clock for the corporation of Richmond, Surrey; one for Colne town hall, Lancashire; one for the Catholic Cathedral, Cambridge; and other important works.

The corporation of Salisbury recently invited competition by the leading turret-clock makers for a large clock to be placed in a new clock-tower now being built in Salisbury, and the firm of John Smith and Sons, Midland Clock Works, Derby, has been selected to carry out the work. The clock will be constructed with all the latest improvements generally to the designs of Lord Grimthorpe. The time will be shown on four illuminated dials, each 5ft. across. The pendulum will be compensated, and will weigh about 3cwt. The same firm are making St. Paul's Cathedral new clock under Lord Grimthorpe's supervision.

THE BLOUNT DOOR SPRING AND CHECK.

THE novel feature with regard to this door spring and check, which is made and introduced by Messrs. Charles Winn and Co., of Granville-street, Birmingham, lies in the fact that there are no external rods or cylinders, which disfigure the patterns already offered by some makers; but the article is of a compact form and agreeable to the eye, while the door opens with such slight resistance that one would scarcely notice it—in marked contrast to the excessive force required to open doors to which other makes of door checks are attached. This check is noiseless in working, and the checking power is regulated with a small thumb-screw, by which the door



can be adjusted to close at any speed required, although slamming is entirely prevented. The arms are connected by means of a ball joint, which prevents the motion from binding in case the door drops on its hinges, or swings out of line; and there is a screw adjustment provided by which the length of the arm can be varied to suit mouldings of varying projections. The closing or spring power can readily be increased, decreased, or removed entirely without disarranging any part of the check. The check is sold in four sizes—for light, ordinary, heavy, and extra heavy doors.

THE SOANE MUSEUM CURATORSHIP.

WE are informed that a number of applications have already been sent into Mr. F. A. Eaton, the secretary to the Royal Academy, by candidates for the appointment of curator to Sir John Soane's Museum, and that the last day for receiving applications is the 31st December. A permanent appointment will probably be made early in January. The conditions are peculiar. Under the private Act governing the Museum, the appointment is vested in the President and Council of the Royal Academy, who must proceed to an election within three months of the occurrence of a vacancy, the conditions being that the curator shall be an architect of English birth, and not less than 25 years of age, who shall have distinguished himself in architecture, or carried off some Academic prize. The salary attached to the post is £300, clear of all deductions, with residence. The trustees of the Soane Museum have, however, the power of making a temporary appointment, and they have chosen Mr. Wyatt Papworth, F.R.I.B.A., who has entered upon residence. No better permanent appointment could be made for the post than that of Mr. Papworth, who has edited every edition of Gwilt's "Encyclopædia," published since 1864, and also the "Dictionary of Architecture"; he has also published many papers on the bibliography of architecture, and is well read in its classics and archaeology. Mr. Papworth, whose portrait was given in the BUILDING NEWS for June 6, 1890, represents in the third generation the traditions of his profession, as his grandfather was one of the architects, builders, and decorative plasterers of the closing years of the eighteenth century. He has been a Fellow of the Institute of Architects for 32 years, and is now serving for the third or fourth time on its council. Since the Soane Museum has been opened four days a week for six months in the year, from February to August inclusive, it has been visited by a larger number of persons, and last year the attendances reached the highest point, about 2,000. It is singular to note that since the museum was opened on the death of Sir John Soane, Jan. 20th, 1837, a period of

nearly 56 years, there have been but three curators, George Bayley, Soame's pupil and assistant, 1837–60; Joseph Bonomi, the Egyptologist, 1860–78; and Joseph W. Wild, the Orientalist and decorator, who died a month since.

CHURCH WALL DECORATION.

THE fine church of St. Peter's, Plymouth, the new nave of which has been erected from designs by Mr. G. H. Fellowes-Prynne, F.R.I.B.A., is about to be decorated by a series of ten panels, to fill the spaces over the arcades, illustrating incidents in the life of St. Peter. These panels will occupy the place of the triforium, below the clerestory, and have been painted by

Mr. E. Fellowes-Prynne, of 8, Aynmore-road, West Kensington. This gentleman has now completed the panel to occupy the space over the central arch on north side of nave. The subject represents St. Peter confessing Jesus to be the Christ. The apostle kneels before Our Lord, who holds out the keys; on each side are groups of the Disciples. The painter has here taken the Gospel narrative of Matthew xvi. 16. Other panels illustrate St. Peter's call, his walking on the sea, his denial, condemnation of Ananias and Sapphira; healing; his vision, and other incidents recorded in the Acts. Above the chancel arch, which is the work of the late Mr. Street, who designed the chancel, a considerable wall space is left, which is intended to be filled by a painting representing the Church Triumphant. The spandrels are occupied by tiers of kings and prophets of the Old Testament, while above the apex of arch in a pointed aureole stands our Saviour. His head invested with a nimbus, holding a banner and cross; at the sides are figures of the Blessed Virgin, Joseph, St. John the Baptist, &c. The Twelve Apostles, saints, and martyrs fill up the lateral spaces. The Holy Innocents are at the foot of the aureole, while above angels and archangels and a crowd of the seraphic host appear in serried ranks on a gold ground. The symbols, straight and flamboyant rays, and other decorative features add to the expressiveness and splendour of the composition, which is well balanced and in excellent perspective. In the painting of the panel subjects the artist has adopted strong colours, having in view the position above the eye and the light, the ground being of gold imitating mosaic.

Mr. W. H. Stanley, architect, of Trowbridge, has received instructions from the Right Hon. Lord Donington to prepare plans for various alterations and additions to the residence known as Farleigh Hungerford Castle, in the county of Somerset.

On Saturday afternoon 50 students attending the architectural and building construction classes of the Glasgow Technical College (Mr. Charles Gourlay, lecturer) visited Hawkhead Asylum. The party were conducted by Mr. Crawford, clerk of works, through the main portion, which is just being built, the farm-stead, which is nearly finished, and finally inspected the quarry on the estate, whence some of the stone is being obtained.

The corporation of Manchester are about to apply to the Local Government Board for a provisional order enabling them to borrow £60,000 for the purpose of open spaces. The following is an estimate of the requirements in each district: Gorton, £7,400; Openshaw, £5,000; Clayton, £9,000; Newton Heath (Gaskell-street), £1,400; Crumpsall (Oak-road), £12,000; Gibbon-street, £10,500; Prussia-street, £500; Birch Fields, £4,159; Harpurhey, £2,470; Bradford, £1,010; Mount-street and Raven-street, £1,694; St. Michael's, £1,436; Phillips Park, £1,750—total, £58,319.

COMPETITIONS.

BEXHILL.—In the competition for the new local board offices, the assessor has selected the designs of Mr. H. Ward, architect, of Hastings.

BIRMINGHAM.—The Birmingham City Council took on Tuesday the first step towards the provision of a new Municipal Technical School, by authorising the purchase of a site in Suffolk-street, at a cost of nearly £12,000. About a year ago the Corporation took over the industrial department of the Midland Institute, and added to the curriculum and appliances. The rooms are now overcrowded with students. The Technical School Committee were authorised to obtain designs for the erection of a central technical school, from competing architects, submitting one design to the Council for acceptance, with an estimate of the cost of carrying it out, and for this purpose to employ a consulting architect.

MYTHOLMROYD.—In the recent open competition for schemes for dealing with the sewage of Mytholmroyd, Yorkshire, the three premiums of £60, £25, and £15 have been awarded as follows:—1st, Mr. F. Beesley, Westminster; 2nd, Mr. W. H. Thomas, Westminster; 3rd, Messrs. Savage and Davies, Sheffield.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The lecture session of this society was opened on Monday night by Mr. A. Keen, of London, who gave an address on the subject of "Vaulting." Mr. Bulmer, the president, was in the chair. The lecturer set out with an expression of the fear that the casual observer, in looking at an ordinary building, never realised the extent to which the vaulting over his head governed the plan and general disposition of the building. But when anyone came to design such a structure, the importance of the vaulting impressed itself upon him with startling force. Mr. Keen next traced the origin and early history of the arch in various countries, particularly in Egypt, after which he passed on to notice the use which the Chaldeans made of the arch and vaulting. In Roman times the interest in vaulting consisted chiefly in the scope for artistic work which its surface presented. In due course the early history and the uses of the flying buttresses were traced, and its importance in connection with groin vaulting was mentioned. The pointed arch had, observed the lecturer, exercised more influence on the groin vault than anything else. Indeed, many modern achievements in the way of vaulting would have been quite impossible without the pointed arch. The actual construction of vaulting in modern work was illustrated, and a comparison made between English and French vaulting. In conclusion Mr. Keen touched in detail upon fan tracery vaulting, and described the ornamental bosses in use in the Gothic vault.

YORK ARCHITECTURAL ASSOCIATION.—The annual dinner of this association was held at the White Swan Hotel, Pavement, on Thursday evening, the 1st inst., Mr. W. Hepper presiding, and Mr. W. Pollard being in the vice-chair. Those who took part in the post-prandial proceedings were the gentlemen named, and Messrs. H. Perkins, Hirst, Parkin, Yeomans, Fellgate, Dow, Clappole, and Milburn.

The Duchess of Albany distributed, at the Chelsea Town Hall on Thursday evening last, the prizes and certificates to the students of the science and art classes carried on in connection with the Polytechnic Institute for South-West London, at the Onslow College, King's-road, Chelsea. Lord Chelmsford presided.

A boys' school at Frodsham was opened on Wednesday week by the Bishop of Chester. It occupies the site of the old grammar school, but covers a larger area. The floor is covered with pitch-pine blocks on cement concrete bed. The main building is 70ft. by 26ft., and 20ft. 3in. high. Internally the school is lined with glazed brick to the height of 5ft., above which the walls will be decorated in duresco paint in tints. The premises are built of local brick, with Rusabon patent terracotta dressings, specially made to the architects' drawings. The cost, exclusive of furniture, is £1,150. The school has been erected by Mr. Thos. Davies, of Frodsham, from designs by Messrs. C. E. Linaker and S. Davies, architects, Frodsham, Mr. John Davies having acted as clerk of works.

Building Intelligence.

JUNIOR CONSTITUTIONAL CLUB.—This building, which was opened for the use of members last Monday, occupies the site of four houses in Piccadilly between the Badminton Club on the east, and Sir Julian Goldsmid's house on the west, with a superficial area of about 11,000ft. The basement contains a kitchen, 58ft. by 24ft., with larders and other offices surrounding it. On this floor also are the wine-cellars and servants' hall, and rooms for men-servants, as well as a considerable space devoted to steam boilers, pumps, &c., for the purpose of supplying steam for kitchen, &c., and for heating the house. On the mezzanine floor over, which is on the level of Yarmouth-mews, are arranged stewards' offices, and rooms for the upper servants, still-room, and members' lavatories, &c. The ground floor is raised about 7 feet above the level of Piccadilly, and contains in the front a smoking and morning-room 85ft. long by 28ft. wide, 22ft. high, divided by white marble columns with deeply recessed bays. At the back is a billiard-room with three tables. The entrance-hall is placed at the east end facing Piccadilly, with an entrance-door of Ross of Mull granite flanked with large Shap granite columns. From this, by a flight of marble steps a spacious vestibule is entered, off which is a reception-room. The vestibule opens into an inner hall 44ft. by 30ft. divided by large red marble columns which mask the staircase leading to the first floor. This staircase is 10ft. wide, entirely of white marble, with Waulsort marble balusters, while the walls of the whole of this, as well as the inner and outer halls and the wide vestibules on the principal floors are lined with Waulsort and clouded vein marble. On the first floor the staircase leads to a central landing 24ft. by 20ft., off which is the morning-room, 72ft. long by 25ft. wide, with the back part raised some two or three feet. The grand dining-room is L-shaped, the front portion with deeply-recessed bays being 85ft. by 28ft., and 20ft. high. The returned portion of this room is 60ft. by 25ft., giving a total length of 145ft., and is so arranged that it can at any time be used for public meetings. On the second floor is a library 62ft. by 25ft., fitted up all round with bookcases, and in addition are drawing, house committee, and dining, card, and private billiard rooms, and rooms for the secretary and staff. On the three upper floors have been arranged between sixty and seventy bedrooms, for the use of members, and rooms for servants. Throughout the building marble has been largely used; the principal portions of the building, and the whole of the internal fittings and ceilings, have been designed by the architect. The whole of the building throughout, including the roof, is of fireproof construction, by Messrs. Homan and Rodgers. The exterior facing Piccadilly has three boldly designed bays with gables over, the whole front being faced with white Norwegian marble with Portland stone used in the dressings and cornices. The design of the façade is Italian Renaissance, freely treated. Colonel Robert W. Edis, F.S.A., is the architect. The general work has been done by Messrs. Bywaters and Sons, the ornamental plastering work by Messrs. Jackson and Sons, the elevator and lifts by the American Elevator Co., the whole of the marble and stone front having been executed by Messrs. Burke and Co. The principal rooms are fitted with electroliers, by Messrs. Rashleigh, Phipps, and Dawson. We illustrated the plans and view of the clubhouse in our issue for October 10, 1890, and after an inspection of the building we may say that it is one of the most sumptuously furnished and conveniently planned clubs in London, skilfully contrived without any meretricious detail.

PATRICROFT.—The foundation-stones of a new workhouse for the Barton-upon-Irwell Union were laid on the 30th inst. The building when completed will give accommodation for 500 inmates, with provision on the grounds for further extension when necessary. The workhouse will be built in sections, so as to provide for the housing of the inmates without removal to other premises. The first section will consist of the aged, infirm, and able-bodied inmates' ward, and the administration block. The contract for this first section has been let to Messrs. Southern and Sons, of Salford, at a cost of £16,250, and is to be completed by the end of April next. When finished, the remainder of the buildings will be let, and it is expected

the total cost will be about £30,000. Messrs. Mangnall and Littlewoods, of Brown-street, Manchester, whose design was selected in competition, are the architects for the building. The building will be plain yet substantial in character. The administration offices, which contain the master's residence at the front, with the dining-room near to, will be used for Sunday services, and will be heated artificially.

RAWMARSH.—The new offices of the Local Board on Rawmarsh-hill, Parkgate, were formally opened on November 30. The new buildings are in the Renaissance style. The facings are of pressed bricks, with local stone dressings and mouldings. The main entrance is in the centre of the front. To the right is the clerk's office and a strong room. To the left is the collector's office, while at the end of the hall is the surveyor's office. The principal rooms upstairs are the board and committee-rooms. Adjoining the offices, and connected therewith by a passage, is a commodious caretaker's house. The total cost of the buildings and furnishing (exclusive of site) is about £2,050. The contractors have been: Mason and brickwork, Mr. W. H. Trehern, of Parkgate; joiners' work and part of furniture, Mr. John Tradewell, of Parkgate; and encaustic tiles, Messrs. Minton, Hollins, and Co. Mr. J. Platts, of Rawmarsh-hill, was the architect.

SHEFFIELD.—The new police-station at Neepsend is ready for occupation. It is situated at the corner of Burton-road and Hicks-street, and is carried out in pressed red bricks, with stone dressings. The chief elevation is broken up by two gables, one of which is above an arched gateway leading into the parade ground. The buildings consist of a charge office and search-room, with two cells, and lavatory and closet accommodation for officials and prisoners. There are also two dwelling-houses for police officers abutting upon the station yard; but the charge office and cells are self-contained, and completely shut off from the dwelling-houses, as well as from the adjoining street, while further cell accommodation can be added when required, without any rearrangement, and at a minimum of expense. The buildings have been designed and carried out by the borough surveyor and his staff at a cost of about £1,650, the contractors being Messrs. Walker and Slater, of Derby.

CHIPS.

Some extensive warehouses which have been in course of erection for the last four months in Drake-street and Richard-street, Rochdale, for the local Canal Company, are now completed. The work, which has been in the hands of Mr. Thomas Taylor, of Rochdale, was inspected on Wednesday week. The premises cover an area of over 3,000 square yards, and will be fitted up with the most modern machinery for hoisting, lifting, loading, and unloading. There is accommodation for 15,000 bales of cotton, and the whole process of loading and unloading can be carried on under cover.

Mr. Tate has finally accepted Sir William Harcourt's offer of the site at Millbank for his collection of modern pictures, which he gives unconditionally to the nation.

The trustees under the will of the late Alderman Scott, of Burnley, have bought a site for a public park for the town. The amount available, with interest, for the purchase was between £15,000 and £16,000. The trustees have secured a plot of land at the west end of the town, part of the Hood House estate. It is about 16 acres in extent, and running through it is a well-wooded clough.

At the Manchester Consistory Court, on Friday, a citation was decreed for a faculty to insert in St. Mary's Church, Whalley, a memorial stained-glass window, designed by Mr. E. Burne Jones, A.R.A., and executed by Mr. William Morris in the place now occupied by a plain-glass window, at the east end of the southern wall of the church. A representation of the Good Shepherd will occupy the centre portion, with the figure of an angel on either side. At the base of the window will be verses 10 and 11 of John x.

Myrtle-street Baptist Chapel, Liverpool, has been closed for renovation and decoration. Messrs. Morton and Son, Bold-street, Liverpool, are carrying out the works.

In a letter to Tuesday's *Liverpool Mercury*, Col. C. O. Ellison, the first President of the Society of Architects, propounds a scheme for covering over a portion of Great Charlotte-street, between the markets of Liverpool, with iron and glass roofs. The subject will be brought under the consideration of the Markets Committee.

Correspondence.

CHRIST HOSPITAL COMPETITION.

To the Editor of the BUILDING NEWS.

SIR,—Before it is too late, will you allow me, through the medium of your large circulation, to suggest to the Council of Almoners the possibility of selecting at least ten names for this competition, and divide the premiums as follows?—No. 1, the execution of the work; 2, £400 premium; 3, £200 premium; and £100 each to the next six.

This would be more liberal to the profession generally, and give more employment to draughtsmen during the winter. I enclose my card, and remain—I am, &c.,
KUDOS.
(One who has applied to compete.)

BOROUGH OF KEIGHLEY HOSPITAL FOR INFECTIOUS DISEASES COMPETITIVE DESIGNS.

SIR,—In the BUILDING NEWS of the 2nd inst. you give illustrations of the first premiated design for the above, proposed to be erected by the corporation. Further particulars of this competition will, I have no doubt, interest your readers—more particularly the thirty competitors who forwarded designs.

The conditions issued by the corporation to be observed by the architects contained the following directions, viz.:

"No architect will be appointed unless his designs meet with the approval of the Local Government Board.

"Competitors to send descriptive specification with estimates of the buildings, which must not exceed £4,000.

"The following buildings to be provided, viz.—Administrative Department: . . . three hospital wards of 10 beds each; disinfecting rooms and apparatus; laundry, with necessary fittings; boiler-house, with boiler and chimney; mortuary; ambulance-house; and stabling for two horses."

The estimated cost of the buildings "must not exceed £4,000," and I take it the estimate accompanying the successful designs did not exceed this sum; otherwise they would (or should) have been disqualified. Bearing this in mind, it is exceedingly strange—to put it mildly—that after all the accepted plans, which should have been so arranged when submitted as to meet with the approval of the Local Government Board have, by order of the Corporation, been *entirely* rearranged, the typhoid-fever block *abandoned*, one story taken off the administrative block, the disinfecting apparatus, &c., not included, and other deductions made. The amended estimate of the accepted local architect is still several hundred pounds more than the sum fixed by the Corporation for the complete scheme, and upon which the competing architects based their designs.

It is admitted that the cost of the accepted designs has been reduced some £1,500, and still remains considerably over the sum fixed by the conditions, and the committee must have known when they accepted the plans that it was utterly impossible to carry out this scheme for the sum stated.

Some 30 sets of plans were submitted, and at a reasonable estimate must have cost £600 to produce. After this trouble and expense, it is surely not too much to expect to be treated fairly, and that the terms of the competition should be reasonably adhered to.

I should say that no professional assessor has been appointed by the Corporation in this matter.

—I am, &c.,

COMPETITOR.

DRAINING AND PLUMBING SPECIFICATION.

SIR,—The motive that has actuated Mr. Baker in writing his specification is in itself commendable; but his object is not likely to be attained unless he gives more trustworthy advice than he has in some cases. It is, therefore, necessary, in the interests of sanitation, to draw attention to a few errors.

In Clause 79 he specifies the mode of constructing a soil-pipe junction that is about as bad as it can be. Perhaps Mr. Baker will state why he requires the fall of the branch pipe not to exceed 10°; the fall cannot be too great, and should not be less than about 30°. Again, the form in which the branch pipe enters the main pipe, as shown

in Fig. 11, is bad in the extreme; when the branch is discharging it cannot fail to foul the opposite side of the main pipe, and when the main pipe is discharging, the lower angle of the junction. The branch pipe should join the main pipe in exactly the same way as two pairs of railway metals at a switch, the bore of the pipe being exactly maintained throughout, and without any angle whatever.

In Clause 92 Mr. Baker gives a table showing when a 3½ in. and when a 4 in. soil-pipe should be used. Can he give any reasons for recommending either of these sizes in the particular cases? The same size pipe that does for one closet will do for a dozen; there is no reason for using a larger pipe. The total time during the day when any water-closet is actually discharging down the soil-pipe will (each discharge taking only a few seconds) probably not exceed a minute, and there is no probability of all the closets being discharged at the same moment. Even if this should occur the discharges would simply be following each other down the pipe at a short distance apart. A 3 in. pipe is large enough for any case, and is in all respects to be preferred to a larger size. What is the use of discharging, say, a valve closet, the diameter of the valve being 2½ in. into a 4 in. pipe? The tendency is to foul the pipe all the way down, whereas, were the same closet to discharge into a 2½ in. or 3 in. pipe, the water, &c., would fall as a piston down the pipe, and clear it as it goes. I know of a case where a 2½ in. soil-pipe was cut into after eighteen years' use, and was found to be bright and polished inside. Can the same be said of a 4 in. pipe? On the other hand, I once took out an old 4 in. vertical lead soil-pipe that was incrustated with hard deposit the whole length of the inside, reducing the diameter to less than 1½ in.

Clause 96 reads as though Mr. Baker recommends, or at least allows, long waste pipes. They should never exceed 4 ft. in length, and the shorter the better; they should be carried immediately through the external wall, and, if not on the lowest floor, discharged into a R.W. head and pipe. The size specified by Mr. Baker, 1½ in., is too large, and no trap should be placed at the outgo of the sink or lavatory basin. The effect of this trap is to retain foul water, destroy the power of the discharge, and to foul and finally stop the waste; on the other hand, if a 1 in. short waste without trap be used, and the are of the outgo of the sink or basin exceed the sectional area of the pipe (which is belled out at top), the water will be discharged at a good velocity and at full bore through the pipe, without leaving any deposit of soap, &c. Wastes should fall, and as much as possible, during their whole length, to prevent air being detained in the pipes, thus practically trapping them with the afore-said evil results.

The same applies to bath wastes, which Mr. Baker would have 2 in. or even 3 in. (!) diameter; 1½ in. is, I find, the best size for bath wastes, and this should not be exceeded. In all cases, whether w.c., sink, or lavatory, the sectional area of the outgo should exceed the sectional area of the waste, so creating a pressure on the water in the pipe, which will then run full bore, instead of dribbling down the sides as it usually does, depositing filth as it goes.

Turning a pipe back in the way shown in Fig. 19 is bad, and should only be resorted to when any other way is impossible. The direction should be straight from the pipe to the drain in an oblique direction with the flow, and at a tangent.

Clause 99 is also objectionable. Wastes should be discharged into the open air over the gully, and not connected by a side inlet under the grating.—I am, &c.,
BERNARD DICKSEE.
35, Queen Victoria-street, E.C., Dec. 5.

"CURIOUS ACTION BY AN ARCHITECT AND CONTRACTOR."

SIR,—In the "Legal Intelligence" of your last issue, and under the above heading, you state:—"Ultimately the defendant got another person to finish the house, which cost him double the money."

This necessitates a correction.

The defendant, after the dispute with plaintiff, instructed me to design a house, which has now been completed from my drawings and under my superintendence, and it was only a few days ago that I knew of other plans being prepared by the plaintiff prior to my being retained.—I am, &c.,
G. A. HUMPHREYS, Architect.

Mostyn Estates Offices, Llandudno, Dec. 5.

ECHO IN BUILDINGS.

SIR,—Re your references to above in last week's BUILDING NEWS, perhaps the following report, received by us a few days ago, and which, we may mention, is only one of many of a similar character we have received from time to time, may prove a solution in one way of the problem, how to do away with echo in buildings?—which, in this particular instance, is a board school in Bridgend, Glamorganshire, to which has been applied one of our latest improved patent self-acting air-pump ventilators, and four of our improved air-inlets.

"You may be interested to know that a school-room in which the reverberation, or echo, of the voices was so great as nearly to drive the teachers out of their senses, and which was under discussion as to whether it should not be abandoned, was, after an air-pump ventilator and four inlets were fixed, so improved as to be quite usable. This is an interesting case as regards acoustics."

We may state that we have not only found our system of ventilation improve the acoustics of certain buildings, but also the heating, which previously was defective.—We are, &c.,

ROBERT BOYLE AND SON, LIMITED,
Ventilating Engineers,
64, Holborn-viaduct, Dec. 5.

Intercommunication.

QUESTIONS.

[10907].—**Deadening Sound.**—I require a large quantity of sound-deadening material for putting between the joists of floor and ceiling below. I thought of nailing boarding to strips between the joists and depositing thereon small ballast or sand. Is there at a reasonable cost any better method or material for the purpose?—FUGARGE.

[10908].—**Glazing.**—What is the easiest and most accurate way of testing thickness of glass in windows after glazing?—W. A.

[10909].—**Orientation of Churches.**—Will any reader who knows of a noteworthy example of a chancel of any church in England being arranged otherwise than to the east mention the church and circumstances concerning it?—LEVER.

[10910].—**Prices.**—Will some experienced London surveyor kindly tell me what is the proper interpretation of the following sentence:—"The price of brickwork to include all ordinary rough cuttings and rough arches." Would it be right to read a rough arch to mean any arch that could be turned without a centre, or would it be correct to make it include any arch that could be turned in common bricks to be plastered over, provided that the centring be measured in the usual way?—RUSTICUS.

[10911].—**Light.**—I am about to build new premises upon my back-yard. Am I safe if I give my next neighbour an angle of 45° for light to his existing window? Can you refer me to a case where an angle of 45° has been ruled as of sufficient allowance for light and air?—J. W.

[10912].—**By-laws.**—Now that the municipal authorities in a number of towns are adopting the Local Government by-laws, and requiring in some instances different and advanced methods of carrying out work to what may have hitherto been in use, I, along with other of your readers, would be glad to know if there are any special textbooks published which give the required instruction and information in a simple and condensed form, showing more especially the sanitary arrangements required. I think a series of articles on these matters would be of great service to the building trade at the present time.—MODEL BY-LAWS.

REPLIES.

[10893].—**Timber and its Position.**—Before letting this discussion drop I should like to sincerely thank your correspondent "E. S." for the valuable light he has thrown on this subject. I cannot, however, reconcile myself to the fact that sap valves are non-existent, but unfortunately cannot prove that they are. On p. 380 of Rivington's "Building Construction," Vol. III., sap valves are mentioned as being present and opening upwards.—SIDNEY F. HARRIS.

[10896].—**Breaking Weight.**—With all deference to "Deputy B. E." who has appointed himself arbiter on this question, I would suggest that where authorities differ there is no "correct one" except in the opinion of each individual judge. Professor Fidler says "the strength of columns cannot be defined by any hard and fast line, even when the modulus for the whole column and the ultimate strength of the material are accurately known; but, on the contrary, the strength may have any value less than that of the ideal column within certain limits. The strength of the columns must, therefore, be represented by an area, within which the results of individual experiments may be expected to place themselves haphazard." Apropos of this question of doctors differing, "Rivington," Part IV., works out the safe resistance strength of a wooden strut 10 ft. long and 4 in. by 3 in. cross-section by three different formulae—those of Gordon, Rouleaux, and Ritter, and gets these three different results: 5·8 cwt., 15 cwt., and 29·8 cwt.! "Deputy B. E." is mistaken in thinking that I have omitted to notice that the column is "short." The formula which I gave is continuous for all proportions of length to shortest side, and assumes flat-ended firmly fixed columns. The old notion of "short" and "long" columns was a rough and unscientific method of approximating to the point at which bending

strain ceased (and compression pure and simple began. From the nature of the case it is evident that there can be no precise point at which bending strain ceases. If the shape and material of a column, as well as the precise direction of the strain on it could be perfectly adjusted ideally, there would be no bending strain in the longest column at all; but as imperfections do exist, both in workmanship, homogeneity of material, and incidence of stress, it is impossible to fix any precise ratio of length to diameter at which these imperfections may be considered negligible. I cannot express this better than is done in "Rivington IV.," which I consider the most commonsense analysis of practical rules on strengths of materials which has appeared for a long time:—"It is often the practice to divide compression bars into two classes—viz., short compression bars and long compression bars. Short compression bars are those which fail by direct crushing, and their strengths are calculated as if the pressure were uniformly distributed over the cross section. Long compression bars are those which fail by bending, so that some of the fibres are torn. A sudden change in the manner of failing has therefore been assumed. Such an assumption is contrary to all experience and common sense, and it is evident that these two causes of failure lie at the extreme ends of a series, and that between them failure arises from a gradually varying combination of the two causes." Without any intention to muddle "Student," I would remind him that it is of the first importance to know if one's formulae are the only or universally accepted ones, or whether there are many recognised formulae reaching to different results. If he has time to go into the subject, he should compare several formulae, and see how each is built up and justified. If he is preparing for an exam., he should select one and stick to it for exam. purposes; but remember that there are many more, each sworn by, by some one.—SIEN SENG.

[10902].—**Measuring Walls.**—The usual practice in measuring brickwork is to reduce the thickness of wall to the standard of one brick, or one-and-a-half bricks, according to the local custom.—R. J. ANGEL, Birkenhead.

[10903].—**Washable Distemper.**—has soluble silica for its basis. There are various kinds in the market, and it would be cheaper to buy than to make.—R. J. ANGEL, Birkenhead.

[10905].—**Valuer's License.**—The Stamp Act exempts "appraisements or valuations made for, and for the information of, one party only, and not in any manner obligatory as between parties either by agreement or operation of law," and therefore a valuer need not take out a license for an appraisal under these exemptions, but where his valuation becomes binding between parties, the valuer must be licensed.—R. J. ANGEL, Birkenhead.

CHIPS.

The sale of the old wall of Millbank Prison will take place on Tuesday next. One of the special clauses of the sale is that all bidders must agree to pay to any workman demolishing any part of the brickwork they buy a wage of not less than 6½d. per hour. This, it is understood, is the regulation price of brick-wall breakers.

During the past quarter of a century All Saints', or the parish church at Wakefield, now the cathedral church of the diocese, has been considerably altered. The work of restoration has not yet been completed, for workmen have just commenced to enlarge the organ and to rearrange the chimneys. Formerly seven tunes were performed on the bells, but in future there will be double that number. This work is being carried out by Messrs. Gillot and Johnson, of Croydon. The organ is to be overhauled and modernised, and several new stops are to be introduced; this contract has been entrusted to Messrs. Hill and Co., London.

The conversion of works of water supply for Hutton-le-Hole has just been completed for the Kirby Moorside rural sanitary authority. Mr. Robert Richardson, of Malton, was the engineer.

It is proposed to spend £4,000 to complete the structure of St. Nicholas's Church, Blundellsands, Liverpool, the erection of which a few years ago, cost £7,000.

The formal opening of the Athenæum, in Buchanan-street, Glasgow, after extension, at a cost of £30,000, was celebrated by a dinner held on Friday evening. The new wing covers the site of the Religious Instruction Rooms, and has an area of 86 ft. by 45 ft. Messrs. Burnet, Son, and Campbell, of Glasgow, were the architects, and Messrs. Dansken and Purdie the contractors.

A new line of railway between Olney (Midland) and Towcester, an extension of the East and West Junction Railway, was opened for passenger traffic on the 1st inst. The line, which is twelve miles in extent, is the last link connecting the eastern trunk line of the Midland system with the Midland in the west. The new line is single, and passes two stations—Salcey Forest and Stoke Bruerne.

The consecration of a new synagogue in Dublin was solemnised on Sunday afternoon by the Very Rev. Dr. Adler, Chief Rabbi. The building has been erected in Adelaide road, at the end adjoining Fitzwilliam-place. It has cost about £8,000.

Mr. Fred Brown, head master of the Westminster School of Art, in Tufton-street, has been appointed Slade Professor of Fine Art at University College, London, in succession to Professor Legros.

Legal.

FITNESS OF ARBITRATOR.

IN the ordinary way an arbitrator is presumed to be an independent person, and one who will approach the settlement of a dispute submitted to him with an "open mind, and entirely free from any bias or prepossession, one way or the other. This is the theory upon which mercantile and similar arbitrations proceed. But in the working out of the arbitration clauses in building contracts no such theory is presumed, and no such practice is possible. The architect or the engineer engaged by the building owner or other employer, is made the sole judge as between that owner or employer and the contracting builder. It is thus practically impossible for the arbitrator to come to the decision of a dispute in which he is himself really a party, with the independent impartiality of a judge; nor is this expected of him. Reliance is placed upon his professional position and personal honour, and these safeguards against injustice are found quite sufficient. At all events, it is now the recognised custom to make the employer's architect or engineer the sole arbitrator in any dispute arising out of the contract, and as builders are found willing to sign these contracts and accept this curious tribunal as final, it is obvious that the plan, anomalous as it at first sight appears, works out in a satisfactory manner to men of business.

The view taken of this question by the Law Courts has just been explained by the Court of Appeal in the important case of "Jackson v. The Barry Railway Company" (*Times*, Nov. 25). There the plaintiff had entered into a contract with the company for the building of a certain dock, and there was the usual clause that the decision of the chief engineer upon any dispute arising thereunder should be binding upon both parties. A question arose as to the use of stone in a part of the work, the plaintiff contending that it was not within the contract, and so should be paid for as an extra; the company's engineer, on the other hand, maintaining that it was according to the specification, and so included. The company, of course, referred the matter to their engineer under the contract for arbitration. But the plaintiff, relying mainly upon a letter from the engineer, in which he had repeated an opinion that stone must be used, went to Mr. Justice Kekewich, and obtained an injunction against the continuance of the arbitration on the ground that the engineer could not approach the dispute with an "open mind" and without bias. Upon appeal, however, Lords Justices Lindley and Bowen (Lord Justice A. L. Smith differing) have now dissolved this injunction. They did so partly on the ground that they did not consider the arbitrator's letter had prejudged the case; but much more upon the general principle that, from the very nature of the contract to refer to the arbitration of the engineer of the employers, it was impossible that he should not be to some extent biased in favour of the view he had himself urged. They held, in short, that the contractor had agreed to accept his arbitration, and in the absence of some clear proof of unfitness he was bound thereby.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by *Tuesday* morning to insure answer same week.

LEGAL INTELLIGENCE.

CURIOUS ACTION BETWEEN A THEATRE LESSEE AND A CLERGYMAN.—The Rev. J. G. Haworth, of Crumpsall, was the defendant in an action tried at the Manchester Assizes on Wednesday and Thursday week—the plaintiff, Mr. J. P. Hardacre, seeking to recover damages by reason of alleged breach of contract in regard to building a theatre in the place of the old Queen's Theatre, Manchester, destroyed by fire in August, 1890, and of the lease of which Mr. Haworth was the assignee. The property in question (the rental of which was £1,300 a year) came to Mr. Haworth in consequence of the death of a relative a short time before the fire occurred. On behalf of Mr. Hardacre, the lessee, it was stated that Mr. Lawrence Booth, of Manchester, architect, acting for the owner, promised to build a new theatre in place of the one which had been burned down, in accordance with certain plans which he had prepared and which Mr. Hardacre

agreed to. After the plans had been prepared, and after the promise to Mr. Hardacre, the city surveyor insisted that certain changes should be made in them. These alterations had the effect of diminishing the seating accommodation of the theatre, and, therefore, the nightly takings. Mr. Hardacre said he was not consulted about the alterations, and never acquiesced in them. He claimed damages in respect of this and also on account of the delay which had taken place in putting him into possession of the theatre. The defence was that no contract was made for completing the theatre by a given time, and that, though the alterations—which the architect was bound to make in obedience to the corporation by-laws—were explained to Mr. Hardacre, he did not object to the work proceeding under the new condition of things. Mr. Booth gave evidence for the defendant, stating that he had never said anything that could be tortured into an undertaking to complete the building by a certain time. In the result a settlement was arrived at on the suggestion of the judge, the plaintiff being awarded £250 damages, with costs.

RE F. E. B. BEAUMONT.—In this case the debtor, a retired colonel of the Royal Engineers, states that from 1886 to 1890 he was engaged in India in the construction of tunnels for the Mysore Gold Company and the Bombay Waterworks; and that he attributes his insolvency to loss incurred in 1888-9 as sub-contractor in connection with the tunnels for the Bombay Waterworks. The liabilities amount to £3,859, of which £2,359 are expected to rank, and there are no available assets.

THE RIGHTS OF MINERAL OWNERS.—In the Court of Appeal, on Monday and Tuesday, Lords Justices Lindley, Bowen, and A. L. Smith heard the appeal case "The Ruabon Brick and Terracotta Company v. the Great Western Railway Company," in which the question involved was the right of the owners of minerals lying under a railway-line to come upon the line for the purpose of working the minerals. The plaintiffs, the Ruabon Brick and Terracotta Company, are the owners of a bed of clay, valued by witnesses at £100,000, adjacent to and beneath a branch line at Bryn-yr-Owen, near Ruabon, belonging to the defendants, the Great Western Railway Company. Two years ago they sold the Great Western the surface of a portion of the land, and the branch line now passes over it. Last January the plaintiff company served upon the defendant company a statutory notice of their intention to work the clay beneath the railway, and in the autumn they took steps to do so. As these works threatened the existence of the railway, the defendants endeavoured to stop proceedings. Thereupon the plaintiffs commenced an action in the Chancery Division, and moved for an injunction to restrain the defendants from interfering with them in getting the clay from under the railway. The motion was heard, by consent, as the trial of the action last month by Mr. Justice Kekewich, who decided in favour of the plaintiffs. In giving judgment on Tuesday, the Court of Appeal confirmed this decision, and affirmed that the owners of the minerals were entitled to enter upon the company's land for the purpose of working them.

PAY IN LIEU OF NOTICE.—On Monday a labourer named Baker sued Mr. B. E. Nightingale, the builder, for one hour's pay in lieu of notice. Baker, in stating his case, did not assert that notice had not been given him; but admitted that as soon as he received it he ceased work, with a view, he said, of clearing up his tools, and, although requested by the foreman, refused to resume work, claiming his right to do so under rule 5 of the new working rules for the building trades of London. The Lord Mayor, without calling any further evidence, said such an interpretation of the rule was preposterous, and at once dismissed the case.

The town council of Heywood, Lancs., have decided to build a technical school at a cost of about £7,000. Accommodation is to be provided for 800 students.

The new Isle of Man Poor Asylum, erected outside Douglas above Kirk Braddan, at a cost of over £12,000, was formally opened on Friday for the reception of inmates. The institution has been erected upon plans approved by the English Local Government Board, and will accommodate 150 persons.

Colonel W. M. Ducat, R.E., held an enquiry at the Guildhall, Shrewsbury, on Tuesday, respecting the application of the town council to the Local Government Board for power to borrow £7,000 for the erection of the new police-station. The town clerk stated that there had been frequent complaints in regard to the want of accommodation at the present police-office, and the town council had purchased a site on Swan Hill for £2,500. The plans of Mr. J. Johnson, of Queen Victoria-street, London, had been accepted and approved by the Home Office, and Mr. H. Price, a local builder, had entered into a contract to do the building work for £3,484. There was no opposition.

STAINED GLASS.

OSSETT.—Four stained-glass windows have been placed in the Congregational Church at Ossett, to the memory of the late Miss Pickard. They illustrate some of the more notable events in the ministry of Christ on earth and of His disciples. Messrs. Powell Brothers, of 30, Park-square, Leeds, are the artists.

ELLAND.—The large window facing the rostrum in the new Wesleyan chapel at Elland has just been filled with stained glass, to illustrate that portion of the 5th chapter of St. Mark's Gospel where the Saviour, speaking to the woman who had touched his garment, says, "Daughter, thy faith hath made thee whole; go in peace." The window is by Messrs. Powell Brothers, of 30, Park-square, Leeds.

WATER SUPPLY AND SANITARY MATTERS.

NORTHALLERTON, YORKSHIRE.—The Northallerton Local Board of Health have adopted a scheme of main sewerage for the drainage of part of the town and the County Prison, per plans prepared by Mr. D. Balfour, M.Inst.C.E., F.G.S., Newcastle-on-Tyne.

SEVENOAKS.—The Sevenoaks Local Board having applied to the Local Government Board for sanction to borrow £1,500 for sewerage extension, street works, and laying out of recreation ground, Mr. Arnold Taylor, C.E., held an inquiry at the Local Board Offices last week. Mr. Jabez Mann, C.E., surveyor to the board, produced and explained the plans for the several works, the total cost of which is £1,800, of which £300 is paid by owners of property abutting on the line of sewer. There was no opposition to the application.

CHIPS.

At Belfast on Tuesday, while two men, named Reo and Campbell, employed on new buildings in course of construction as an addition to Messrs. Ewart's mills, were engaged on the roof of a rope gable way, and they fell to the ground, a distance of nearly 70ft., and were both killed.

On the 2nd inst. Mr. D. Robinson, chief foreman of works, was presented by the officials, workmen, and others with a 12in. level, tripod, and staff, handsome writing desk, set of carvers, and a tea service for Mrs. Robinson, upon his leaving West Hartlepool to take up the duties of district surveyor to the County Council of Derbyshire. The presentation was made by the borough engineer, Mr. J. W. Brown, A.M.I.C.E., who congratulated Mr. Robinson on his success in obtaining his new appointment; he stated that the West Hartlepool Council were so satisfied with the conduct and abilities of Mr. Robinson, that they had offered to increase his salary 50 per cent, if he would remain with them. Mr. Robinson, however, while appreciating very highly the compliment paid him, declined the offer.

The town council of Arbroath have resolved to obtain the joint opinion of the Lord Advocate and Sir Charles Pearson as to their liabilities with reference to the rebuilding of the Old Church of the burgh, which was destroyed by fire on Nov. 14th.

An inquest was held on Wednesday on a railway policeman who fell down stairs and broke his neck. He resided in Newling-street, Bethnal-green, and his widow told the coroner that the stairs were very steep and had no handrail. The house was recently erected under the supervision of the London County Council. The landlord of the house, in giving evidence, said the "surveyor to the Council" had duly passed the plans. The jury requested the coroner to require the Council to inspect the building and have handrails provided.

The clerk to the Lambeth Vestry attended at the Southwark Police-court on Wednesday to support a summons taken out against the clerk of the School Board for London, charging him with failing to comply with an order to place the Johanna-street Board School in a sanitary condition. Evidence having been adduced in support of the charge, the magistrate adjourned the case for seven days, with a view to the school being closed.

At the last meeting of the London School Board, the Rev. J. Coxhead moved that the works committee should be requested to report whether it would be possible for the board to build a school without the intervention of a contractor. The proposal was negatived by thirty-five votes to nine.

At the adjourned inquest on the body of Janet Vincent, wife of an architect, held at Crewe on the 1st inst., further evidence was given as to the habits of the deceased, and the jury returned a verdict that "The deceased died from congestion of the lungs, accelerated by drinking and exposure to the cold." The Coroner strongly censured the conduct of the husband, and said he was morally, if not legally, guilty of manslaughter.

Our Office Table.

At the Museum of Ghizeh the Khedive has inaugurated the 46 new galleries which during the past six months have been added to the 45 previously existing. The collection of Egyptian antiquities commenced 40 years ago is now for the first time exhibited to the public in its entirety after years of seclusion in the museum store-rooms. Many of the older galleries have been rearranged and enriched from recent discoveries. For the first time a complete catalogue is being prepared by M. P. Virey, a French savant, and will be published in January. The intention is that the museum shall form a complete series of monuments extending from the earliest dynasties to the Byzantine period and that of the Mohammedan Conquest, when the story is taken up and continued in the Museum of Arabic Art at Cairo. The project of removing the entire collection to a fireproof building to be specially constructed for it in Cairo is under discussion.

THE London County Council decided on Tuesday to ask the Government to procure a return of the owners of land in fee in the Metropolis, the quantity held by each, and the amount received therefrom. The Local Government Board is to be asked to exercise the authority it possesses for amending the powers and improving the machinery of the Council. Further legislation is to be sought in respect to the City Guilds, the formation of district councils, the creation of a dock and harbour trust, and other matters. The Council also decided to ask the Government to provide for a new and immediate valuation of the Metropolis, in which the value of land will be stated separately from the buildings, and to seek powers in another of their Bills for the appointment of a special tribunal to hear appeals under the Valuation (Metropolis) Act. At the same meeting, the Improvements Committee reported that the improvements they had in hand were the reconstruction of four bridges in the Isle of Dogs, the widening of St. George's-place, Knightsbridge, the widening of Fortress-road, Kentish Town, and the widening of Sandy's-row, Whitechapel. They were using every effort to have the works begun at the earliest moment possible.

The special committee of the London County Council to whom, in May last, were referred various resolutions and proposals in respect to the rate of wages, have prepared a report embodying a series of standing orders and form of contract which, in the opinion of the committee, will be the best way to insure in all work done on behalf of the Council the payment of trade-union rates of wages and the observance of the hours of labour and conditions recognised by the trade-unions in the place where the work is executed. The report and recommendations are to be considered by the Council on Tuesday next.

The proposed high-level street bridge over the Thames between Ratcliff and Rotherhithe designed by Max Am Ende, M.Inst.C.E., is recommended as being cheaper than the steam ferry proposed by the London County Council and as accommodating a large amount of traffic. The span is 732ft. with concrete platform 42ft. wide. The truss is three-hinged, and a height of 90ft. is shown above high water, though it is possible to increase it to 120ft. At each end there is an inclined platform 100ft. long capable of carrying four or five vehicles. In operation a platform should start from each end of the bridge every two or three minutes with stairways on either side to allow of foot-passenger traffic. The two main trusses are of the braced bowstring type pitched at an angle of about 25°, and meeting at an apex in the centre, which is pivoted. Suspension rods carry the platform about midway between high-water level, and the apex is approached by inclined platforms at both ends.

The Birmingham Corporation received on Tuesday a report as to the total cost of the Victoria Assize Courts, built by Mr. John Bowen in 1887-91 from the designs of Messrs. Aston Webb and Ingress Bell. The total expenditure has been £113,354, whereas the estimated and sanctioned outlay at the outset, before competitive plans were invited, was £91,103. The difference was greatly reduced by the fact that in the original scheme no provision was made for the premiums for competitive designs, consulting architect's fee and sketch plans (which cost

£1,150), nor for architects' commission (£5,275 7s. 5d.), quantity surveyor (£3,511 3s. 7d.), clerk of works (£1,333 6s. 7d.), nor for expenses of laying foundation stone, road-forming, flagging, advertising, and fire-extinguishing appliances. These items amounted in all to nearly £13,400, leaving the net excess of outlay over the original estimate for building, fitting, and furnishing the courts at £8,841 7s. 6d. The report was adopted, the general feeling in the city, as elsewhere, being that Birmingham has obtained good value for the expenditure on its courts.

At the Hall of the Carpenters' Company, London-wall, on Friday night, Professor T. Roger Smith, F.R.I.B.A., delivered the fifth lecture of a free course given by the Carpenters' Company in conjunction with the Sanitary Institute. They have been on matters connected with sanitary building, and intended for candidates preparing for the examination, which takes place to-day (Friday) and to-morrow. The subject last night was "Acts, By-laws, and Official Regulations." Professor Roger Smith, having discussed the Public Health Act, passed on to speak of the law as it related to London, and then as it related to the country. These two points were enlarged upon in an interesting manner. The last lecture of this course was delivered on Wednesday evening by Mr. Henry Law, C.E., on "The Principles of Calculating Areas."

MR. C. R. ASHBEA continued, on Tuesday night, the series of lectures which he has been delivering at the Gem-street School, Birmingham, dealing with the history of English handicraft, and under the auspices of the Oxford University Extension Movement. The lecture was upon furniture and woodwork, and was in continuation of a previous address which dealt with the influence of architecture on the minor arts. Furniture, Mr. Ashbee said, was a craft dependent on architecture. Furniture had been termed the art of the hearth, because it ministered to the internal comfort of the home. There were four periods of furniture—first the Gothic, second the Elizabethan or Jacobean, third the Queen Anne (or 18th Century), and fourth the Modern period. He explained the characteristics of the four periods, saying that that of the first was very dignified, and dealt with solid oak tables, seats, church furniture, &c., and was always a part of architecture. The second was still solid and still a part of architecture, but was less serious, and was not so dignified. They saw it in country halls, panelled ball-rooms, and the elaborate joinery of old mansions. The third period was less dependent on architecture, and there was grace and slenderness in a great deal of the cabinet-work produced. The fourth period, the Modern in furniture, was no style at all, and was not dependent on architecture. The four representatives of these periods were: (1) The Gothic carpenter; (2) the Jacobean joiner; (3) the 18th-century cabinet-maker; and (4) the 19th-century machine. The lecture was illustrated with the aid of the limelight, a fine collection of wood-work and furniture of various kinds being shown by means of slides upon a screen.

MR. HARRY HEMS's art studios at Exeter were on *fête* on Saturday evening, when over three score members of his staff, together with outside friends, celebrated the 26th anniversary of his first arrival in Exeter, and of picking up the horse-shoe so closely identified with his successful career. One of the wood-working shops had been cleared, and was gaily decorated. After a capital repast, punch-bowls, pipes, and cigars were brought on. Music was given by Mrs. George Packham (the host's eldest daughter), Miss Hems, and Miss Florence Jennings, and Miss Mabel M. Hems, the latter playing violin solos. Mr. Harry Hems occupied the chair. The vice-chair was taken for the twenty-fourth time by Mr. F. Dyer, the senior craftsman of the establishment. The toast of "The Church," proposed by Mr. John Algar, the rector of St. Sidwell's, was acknowledged by the Rev. S. W. E. Bird, M.A. Alderman Domville, J.P., in responding for "Prosperity to the City of Exeter," said it was to those present that Exeter owed its present position. The toast of the evening, "Mr. Harry Hems and his Family," was proposed by the vice-chairman, who referred to the serious illness of Mr. Greville C. Hems, and expressed the hope that he might soon be restored to health. The toast was drunk with musical honours. In returning thanks, Mr. Hems said he was glad to say that their prospects for the coming year were brighter than ever.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Society of Arts. Cantor Lecture No. IV., "Generation of Light from Coal-Gas," by Prof. Vivian Lewes. 8 p.m.
TUESDAY.—Society of Architects. "Some First Principles of Architectural Design," by R. Owen Allison, St. James's Hall, Piccadilly, W. 8 p.m.
Institution of Civil Engineers. Discussion on "The Manufacture of Small Arms." 8 p.m.
WEDNESDAY.—Society of Engineers. Annual Dinner at Holborn Restaurant. 8.15 p.m.
St. Paul's Ecclesiastical Society. Exhibition of Objects of Ecclesiastical Interest, St. Paul's Chapter-house. 7.30 p.m.
Society of Arts. "The Utilisation of Niagara," by Prof. George Forbes, F.R.S. 8 p.m.
FRIDAY.—Architectural Association. "The Formal Garden," by F. Inigo Thomas. 7.30 p.m.

The Architectural Association.—December 16th. Fourth Ordinary General Meeting at 7.30 p.m. Paper by F. Inigo Thomas, Esq., on "The Formal Garden."

ERNEST S. GALE } Hon. Secs.
F. T. W. GOLDSMITH }

Trade News.

WAGES MOVEMENTS.

WAGES IN THE EXTENDED LONDON DISTRICT.—At the Bricklayers' Hall, Southwark Bridge-road, on Friday night, a meeting of building trades delegates was held to consider the present situation with regard to the strikes now in progress. The chair was taken by Mr. W. Barnes (President of the Building Trades Federation). The first question considered was the strike at Croydon, and after a long discussion, upon the motion of Mr. J. Rogers (Amalgamated Society of House Painters and Decorators), seconded by Mr. Gould (General Union of Carpenters), it was decided to support all *bonâ fide* Croydon workmen interested in the struggle, and who are willing to forthwith join their respective unions. It was also decided to vote a substantial weekly sum to the men on strike. The conference then considered the question of the strike at the Middlesex County Lunatic Asylum, Upper Tooting, and it was decided to pay the bricklayers brought out on strike the usual rate of strike pay.

DORCHESTER.—The strike at the Dorset County Asylums has ended, the contractors, Messrs. Pethick, of Plymouth, having made concessions to the men.

DUNDEE.—A meeting was held on Saturday of the Council for Forfarshire, Fifeshire, and Perthshire of the national movement for the registration of plumbers, to consider the dispute which occurred recently at the Technical Institute, Dundee, and which ended in the practical plumbers' class, consisting of 46 students, striking work, on the ground that three tinsmiths were being instructed in the actual work of their trade. The Institute Committee, on being appealed to, stated that under the terms of Sir David Baxter's trust, they were bound to admit to the practical as well as the technical class any person desiring to attend. Councillor Davidson, Perth, presided at the meeting on Saturday, and the secretary read a letter from Mr. Coles, secretary to the Worshipful Company of Plumbers, London, who inclosed a letter from Principal Garnett, Durham College of Science, where a system of instruction for plumbers has been in operation for some considerable time. Dr. Garnett said he did not agree with the Dundee Institute Committee in holding that they were obliged to admit amateurs to the practical classes. Although their college professed to receive into its classes all students over 15 years of age who paid the fees, if any, and who were qualified to profit by the instruction provided, he would refuse ironmongers, tinsmiths, and other amateurs admission to the practical classes, on the grounds that they were incapable of profiting by the classes as conducted. The teaching was intended to supplement the training of the plumber's shop, and he held that it was detrimental to other members of the classes for amateurs to attend, taking up, as they must, far more than their share of the teacher's time. After discussion, it was agreed to recommend the plumbers to return to the classes, and that meantime an effort be made to arrange matters with the institute committee.

WEST BROMWICH.—The bricklayers' labourers have gone out on strike against a proposed reduction in wages of $\frac{1}{4}$ d. per hour, notice of which was given by the West Bromwich Master Builders' Association. The wages were 5d. till July last, when an advance of $\frac{1}{4}$ d. per hour was conceded.

New stalls, designed by Mr. A. Barnes, F.R.I.B.A., have just been placed in the chancel of St. John's Church, Badminton, Bristol. They are of pitch pine, and have been carved by Mr. George Houghton, of the Society of Bristol Sculptors.

Railway Stations.	Broadstone, Dublin	Ealing Terminus	Renilworth	Monkwearmouth	Slough	Westminster	Dublin Castle	Schools, &c.	Stratford, Col-
	Burdett Road	Earl's Court	Kensal Green	Moorgate Street	Soho	Whitechurch	Police Barracks		grave Road
Acton Green	Burscough Junction	Edgware Road	Kentish Town	Monument	South Bromley	Whitechapel	Eastney	Belfast Method-	Stratford, Sal-
Aldersgate street	Burton	Failsworth	Kilburn	Newcastle-	South Kensington	Whitefield	Fleetwood	St. College	way Place
Aldgate	Bury	Farringdon Street	Kilby	under-Lyme	Southport	Whitley	Fulwood	Battersea, St. Stutton	
Althorp Park	Borough Road	Fenchurch Street	King's Cross	New Cross	Speke	Widnes	Halifax	Mary's Church St. Jude's	Tayport
Altrincham	Mersey Tunnel	Finchley Road	King William Street	Newport	Spring Grove	Willenhall Bridge	Hamilton, Glas-	Birmingham,	
Aston	Canonbury	Finsbury	Langley Green	Newton Heath	Stechford	Willesden	gow	Cowper Street	Torrington
Ash Street,	Camden Road	Forest Gate	Latimer Road	North Brentford	Stokeley	Wood Green	Hulme	Clapham	Upton Cross
Stockport	Chalk Farm	Forest Road	Lea Bridge	North Bridge	Stoke	Wormwood	Knightsbridge	Colchester	Wandsworth
Birmingham,	Charing Cross	Level Crossing	Leamington	Northampton	Stourbridge	Scrubbs	Leicester, Glen	Forest Gate	Hospitals.
New Street	Cheddington	Fulham	Leman Street	(Castle Station)	Stratford	Worsley	Parva	Hanway Place	
Banbury	Cheetham Hill	Gedley	Leyland	Nottingham	Stretford	Wolverhampton	Manchester		
Barnsby	Junction	Gloucester Road	Leyton	Oldbury	Sudbury	Newbridge	Newcastle-on-Tyne	Harrow	Belfast County
Barnsley	Chequerbent	Gower Street	Leytonstone	Old Ford	Sunderland	Newcastle-on-Tyne	Normanton	Harrostock Hill	Lunatic Asylum
Batley	Clayton	Grantham	Lichfield	Oldham (Mumps)	Sutton	Normalton	Northampton	Orphan Work-	Greenwich In-
Bedminster	Clifton	Greenwich	Linehouse	Paddington	Sutton Coldfield	Norwich	Norwich	mar School	firmery
Bescot Junction	Clitheroe	Hackney	Lincoln	Parsons Green	Temple	Portsea	Portsmouth	Lincolnshire	Guy's Hospital
Birmingham	Crews	Haggerston	Little Ealing	Patricroft	Thornton	Portsmouth	Preston	Leyton, Church	County Asylum
Bishopsgate	Crooked Billet	Hammersmith	Liverpool Road,	Penzance	Torquay	Regent's Park	Regent's Park	Road	Middlesex
Blackfriars	Level Crossing	Heaton Park	Manchester Street	Pickle Bridge	Tower of London	Salford	Salford	Old Ford	County Lunatic Asylum
Blackfriars	Cross Lane	Hereford, Barr's	Llandudno	Plaiatow	Tring	Shorncliffe	Shorncliffe	Poplar, Byron & Peterborough	Nedley Hospital
Bridge	Crumpsall	Court	Long Buckley	Plymouth	Tynemouth	Trim	Trim	Bright Street	Infirmary
Blake Street, Sut-	Cullercoates	Highbury	Ludgate Hill	Portsmouth	Upton Park	Warrley	Winchester	Southsea, Church Path	Northfield
ton Coldfield	Cannon Street	Highbury	Ludgate Hill	Presthich	Victoria	Winchester	Woolwich	Southsea, Omega St. Thomas's	Hospital
Blaydon-on-Tyne	Dalston	Highdram Road,	Mark Lane	Road	Waltham Green	Curragh Camp	Dublin, Beggar's		
Bletchley	Daubhill	Wallsend	Maidstone	Road	Walsall	Dublin, Island	Bush		
Bolton	Daybrook	Hollinwood	Manchester	Salisbury Road	Waterloo,	Bridge	Dublin, Island		
Bolts Bridge	Deulhelme	Holyhead	Manchester, Ex-	Seething Lane	Waste	Dublin, Ship	Dublin, Ship		
Bombay, India	Derby	Homerton	change	Shedwell	Werneth, Old-	Street	Street		
Bow	Droylesden	Horley	Manchester, Ex-	Sheffield	Westbourne	Dublin Royal	Dublin Royal		
Bowdon Central	Drighlington	Hounslow	Manchester, Ex-	Shoreditch	Westbourne	Barracks	Barracks		
Brick Lane	Dudley	Hounslow Bar-	Manchester, Ex-	Sloane Square	Westbourne				
Bristol	Dudley Port	racks	Mansion House	Snow Hill, Bir-					
Broadfield	Dundee	Keighley	Mildmay Park	milverton					
Broad Street	Ealing Common	Kemble Junction	Milthill						

THE BUILDING PEWS, DEC. 9, 1892.



"CHRIST IN THE MIDST OF THE DOCTORS"

PAINTED BY HOLMAN HUNT

EXECUTED IN MOSAIC BY JAS POWELL & SONS FOR CLIFTON COLLEGE CHAPEL.

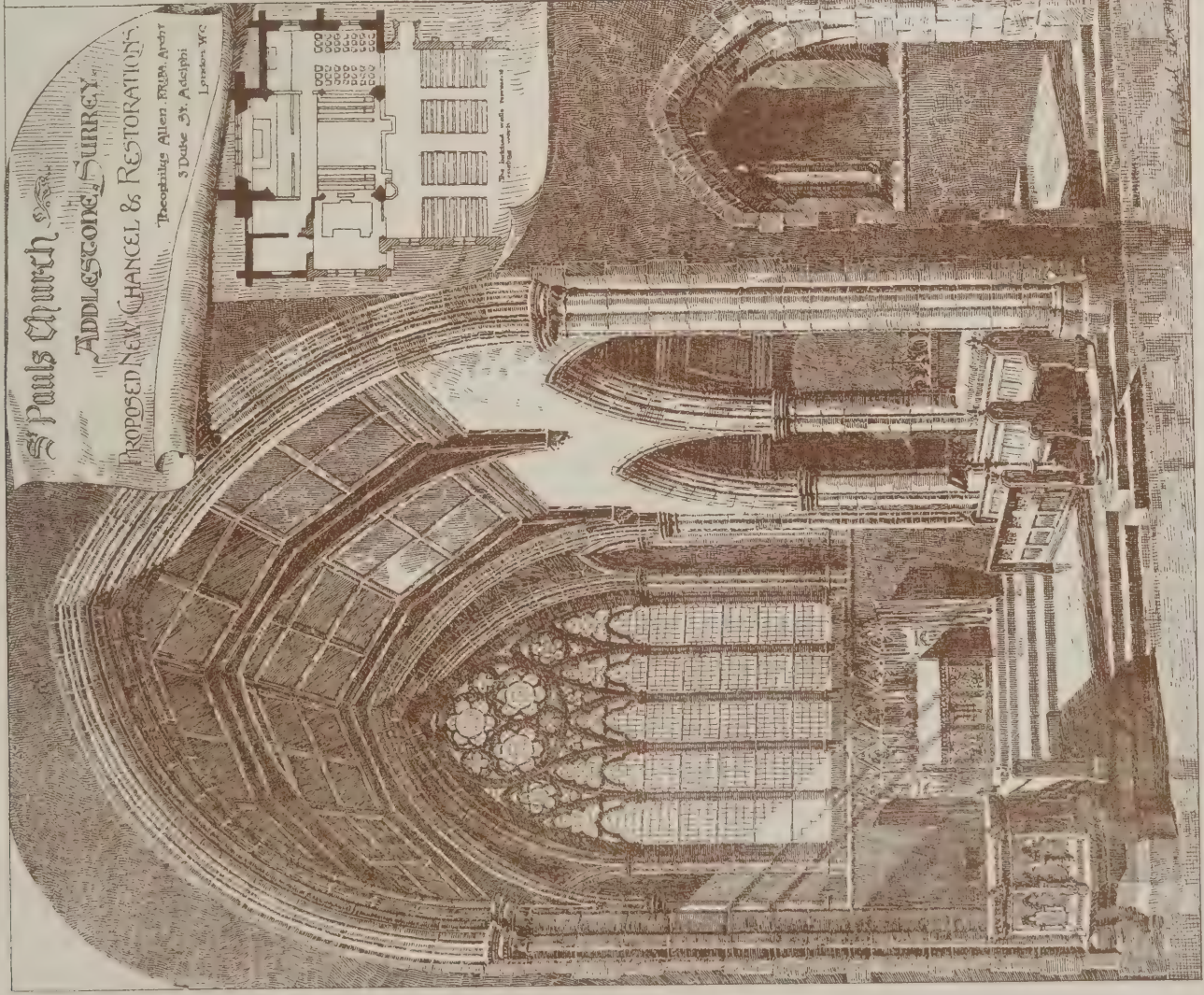
Photo. lith. by J. W. & J. H. Groom, London.

THE BUILDING NEWS, DEC. 9, 1892.

BUILDINGS IN MAYFAIR.

MESSRS GILES COUGH & TROLLOPE, ARCHITECTS.

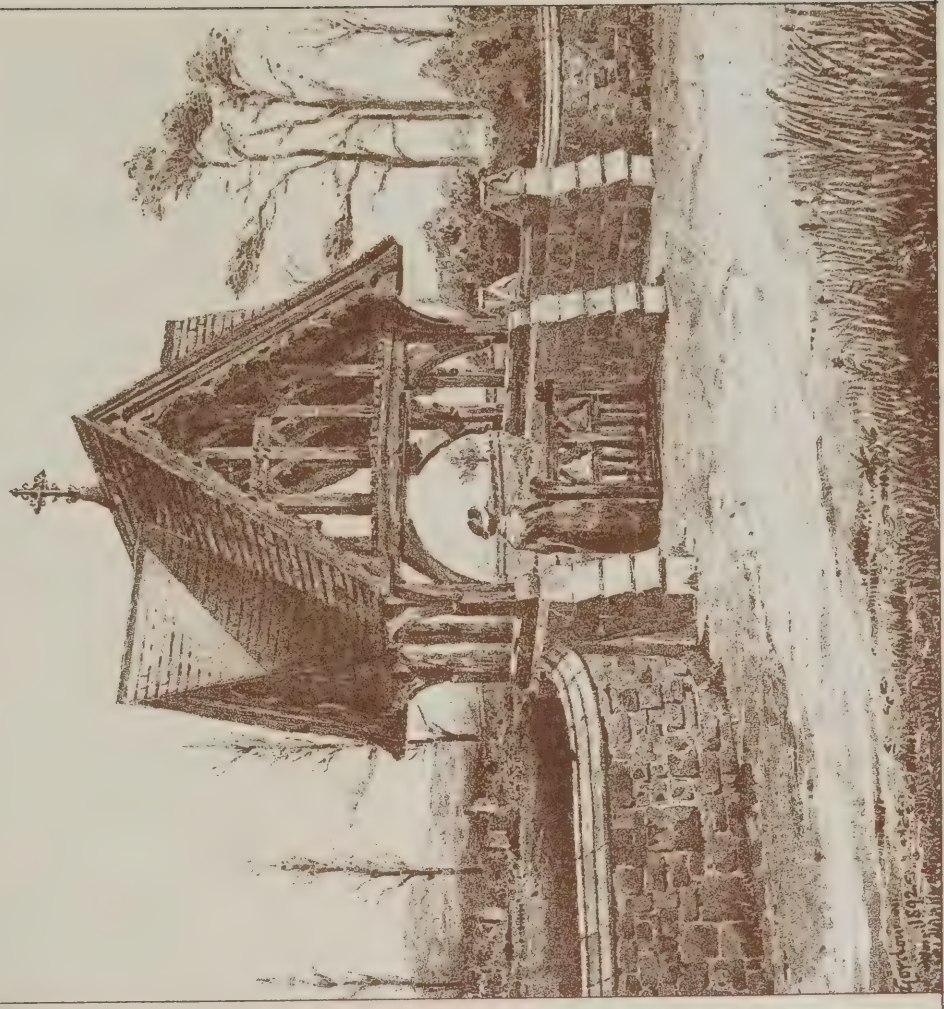




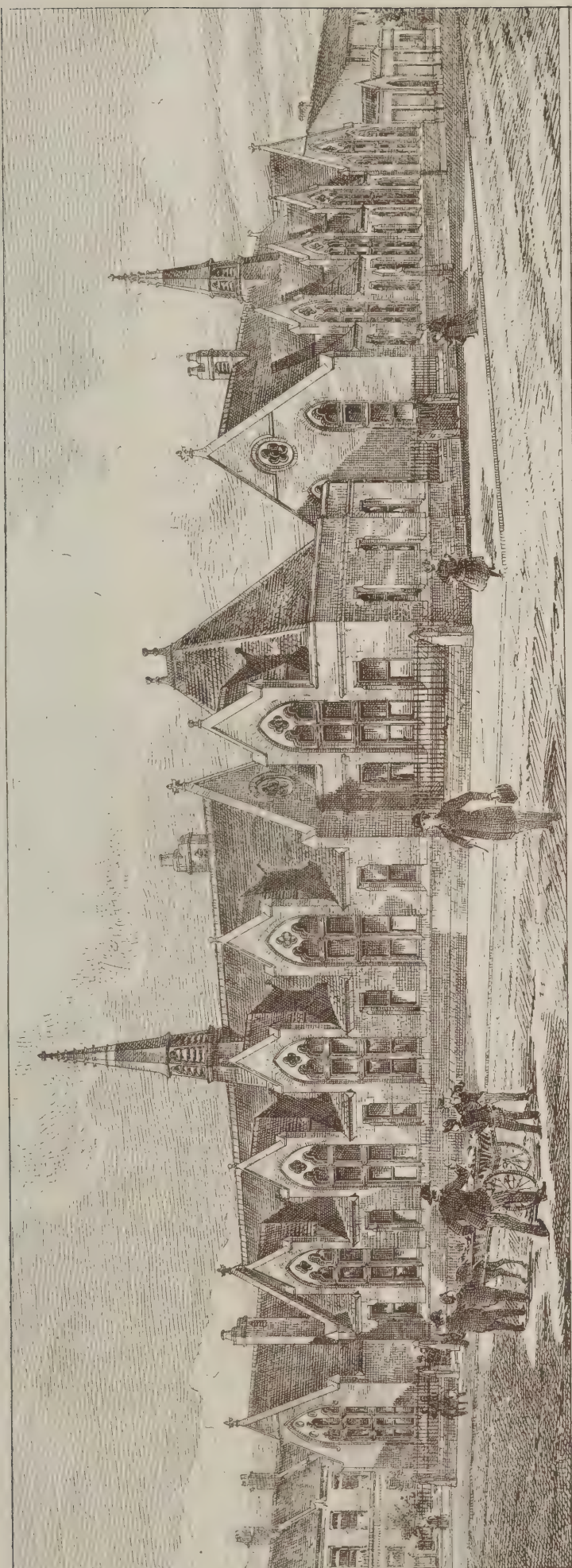
St Pauls Church
ADDLESTONE, SURREY.
PROPOSED NEW CHANCEL & RESTORATION.
Theophilus Allen Esq. Archt.
3 Duke St. Adelphi
London W.C.

Wribbenhall-Chvreh; Lygh Gate.

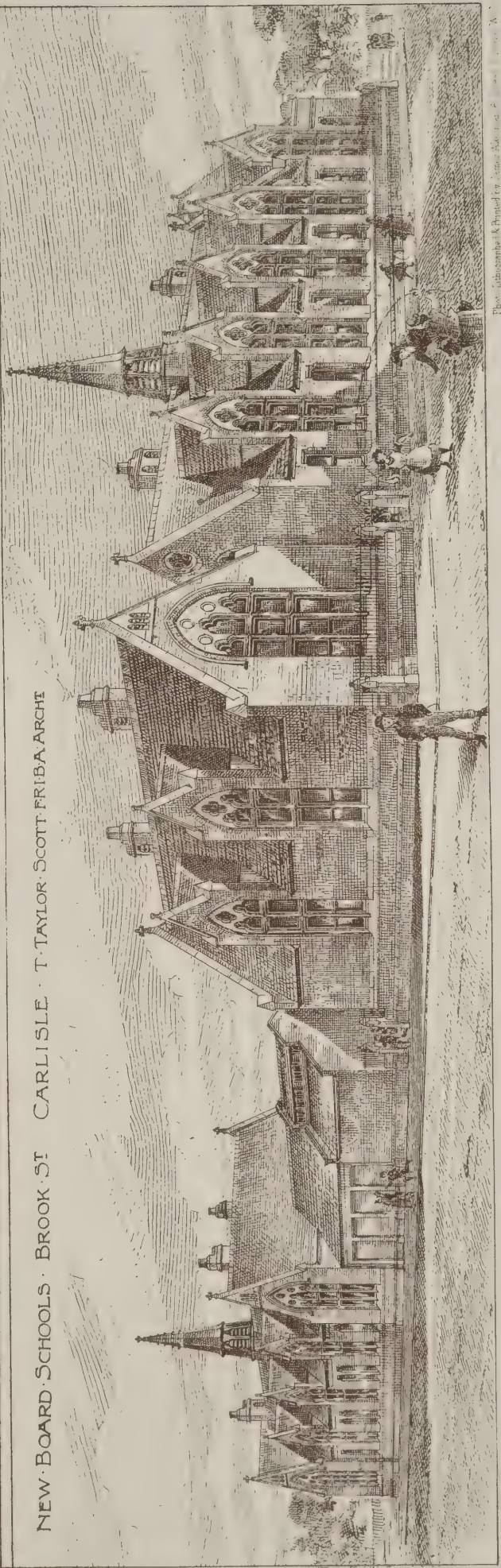
- Thos. Gordon, Architect.



"PHOTO-TINT" by James Akerman & Co. Queen Square, London, W.C.

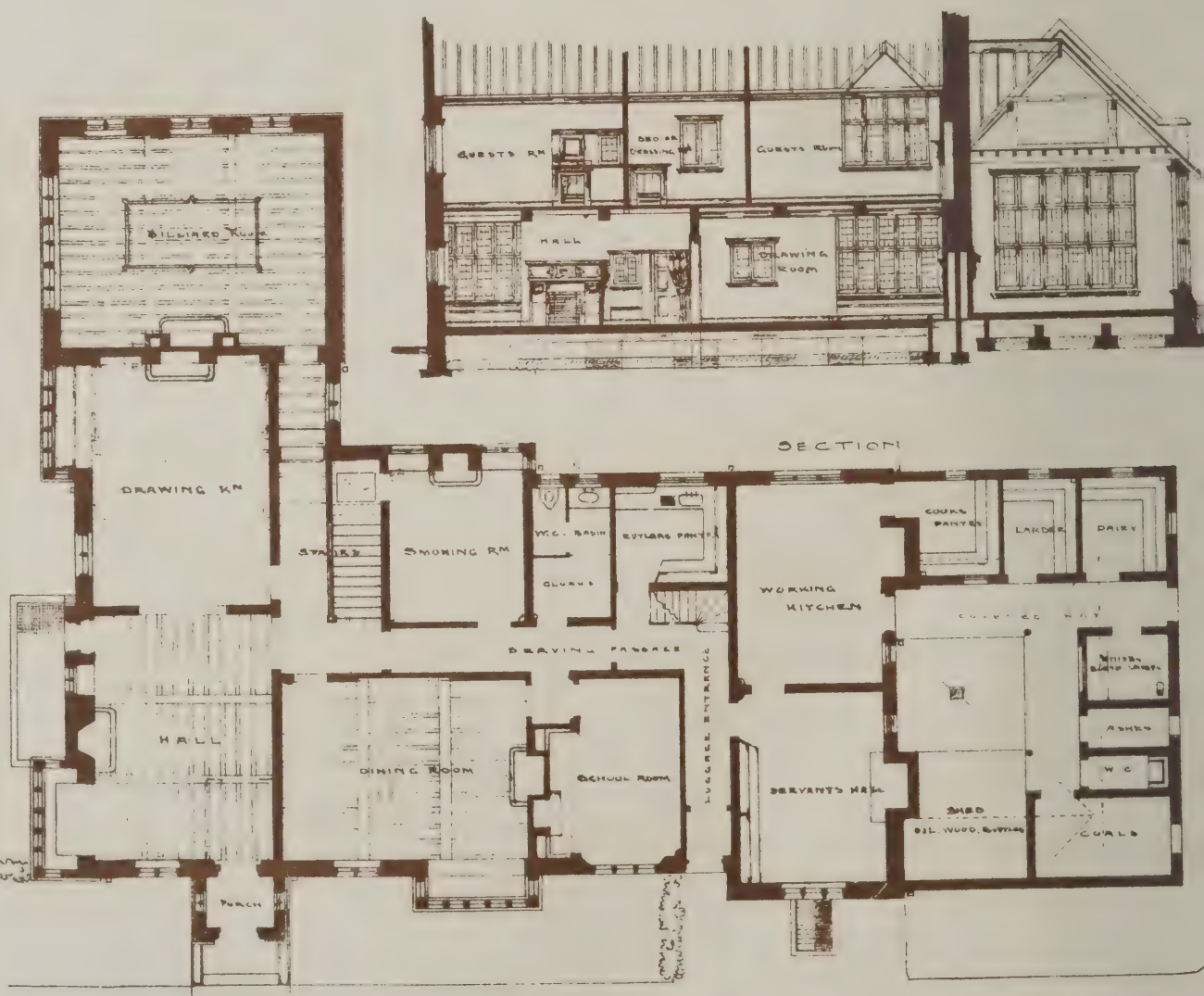


NEW BOARD SCHOOLS · BROOK ST · CARLISLE · T. TAYLOR · SCOTT · FRIBA · ARCHT





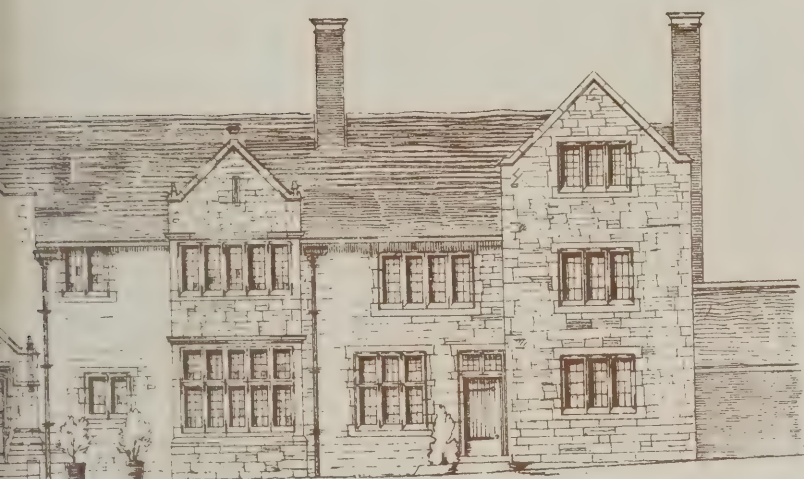
S.W. ELEVATION



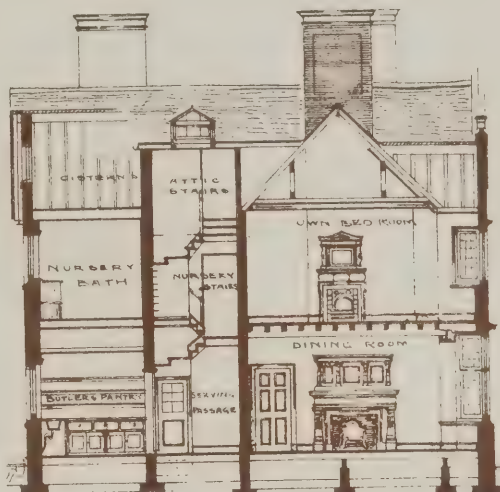
GROUND PLAN



FIRSDENE · BROMSGOVE ·
· F. M. CARTLAND ESQ. ·



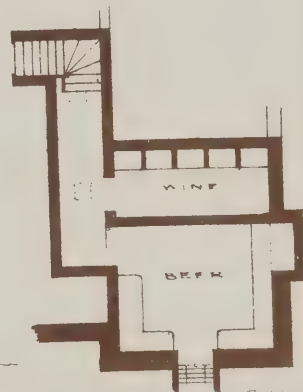
S. E. ELEVATION.



SECTION



REAR ELEVATION



CELLAR



CHAMBER PLAN



ATTICS



Paterson & Paterson
Architects.

THE BUILDING JEWES, DEC. 9, 1892.





WESTMINSTER ABBEY. THE NORTH TRANSEPT AS RESTORED. J. L. PEARSON. RA. ARCHT.
THE RESTORATION OF THE ENTRANCE PORTALS. BY THE LATE SIR GILBERT SCOTT.

PHOTO-TINT BY JAMES ALKEMAN, Queen Square, London, W.C.

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FRIDAY, DECEMBER 16, 1892.

VICARIOUS DESIGN.

ONE of the strongest objections to our modern architectural system is that of its vicariousness—the delegation of the architect's duties to others. The champions of high art are never tired of recalling those periods of history when sculpture, painting, and architecture were branches of one universal art—when every workman was an artist, and every architect a master craftsman. They bid us look at Donatello, Brunelleschi, and Ghiberti of the early Medici epoch, and to the great English builder, William of Wykeham, to the crafts of metal-work and pottery, cabinet-making, and glass-painting—forgetting that the conditions of art-culture are entirely changed; that art is now “degraded” to the rank of a profession, and craftsmanship to that of a trade. We will not, however, discuss a condition of things we cannot help, if we in some degree must deplore; but we may descend to the more practical region of architectural practice as it is to-day. There are many ways in which architecture is now whittled down. We can understand the transmission of authority from one person to another; but it is not so easy to comprehend how the artist's intention can be handed down unimpaired through contractor, foreman, and workman. The impulsive stroke of the architect's own hand dictated by his mind does not admit of the same translation as that of a verbal instruction or message. When he draws with his own hand the full-size profile of moulding on stone or wood, we get pretty near to the directness of the sculptor's chisel or the painter's brush. The artist's ideal is actually brought to the material by this means; but the case is very different in practice. The eighth of an inch scale drawing is interpreted by the foreman or clerk of works; he enlarges it to a full-size drawing, and this is again handed to the mason or joiner who executes the work. The original is nearly lost in the translation; the moulding is quite another profile to that which the architect drew, or it is so distorted by bad drawing in the curves and members, that he feels disgusted with it when he sees it. How often this occurs every architect knows who cares to see his details properly carried out. Think of the repugnance of the architect who finds his Gothic moulding turned into a commonplace Classic cornice; or his surprise to find one of his choicest mouldings of a capital reversed. We have even known of such a provoking mistake as that of an octagon-shaped turret executed square on plan, owing to the neglect of making a detail in time. The misinterpretation of an architect's design is attributable largely to smallness of scale. Angles and mitres and mouldings cannot be seen, and if the architect's assistant or clerk of works undertakes the enlargement, there is a considerable risk of the design being mutilated or spoiled, unless he is well versed in the style and individual character of his master's work. The very operation of drawing a small detail to a large scale is, as every draughtsman knows, fraught with danger. Two or three inches more or less may make all the difference in a detail like a cornice or moulding, yet such a fraction can scarcely be discernible in an eighth-scale drawing, where the thickness of a line may sometimes mean a distinct member. Then the spirit of the original design or sketch is lost, especially when some mechanical method is resorted

to in the enlargement. We have frequently seen the curvature of a Gothic arch irredeemably ruined in execution because the foreman had struck the curves from too distant centres with longer radii than intended. And how often the clerk of works or carpenter spoils a four-centred or Tudor arch by adopting a scheme of centring in which the long radii arcs are made too straight, and the lower and upper arcs very awkwardly unite. These and similar mistakes arise from adopting a method of setting-out which, if the architect had seen in time, he would not have passed. They teach, no doubt, the absolute importance of showing lines of radius and centres in designs of arches, especially the necessity of the architect making the larger details himself, or at least of supervising the full-size drawings. The loss of artistic feeling in the design is particularly evident in the re-drawing by means of instruments of the architect's sketch details. First, in the process of transmitting delicate curves and touches, the artist's work disappears or is exaggerated; in moulded work the loss is particularly felt. Hand-drawn curves are spoilt by being struck in or patched up with arcs of circles, and the fine susceptibilities of the architect's taste are thus travestied. Who would conscientiously intrust to a foreman, or even clerk of works, the details of the pinnacles, or groups of pinnacles, round a spire? A small elevational drawing of such a feature could not be safely left in the hands of men who, however good as constructors, would resort to mechanical methods of enlargement. As for sculptured ornament or carving, it would be out of all question; and yet in architectural details quite as important these methods are thought sufficient to insure correctness. One word as to sketchiness. This has a fascinating charm to many architects, and in the small-scale elevation nothing tells so much in giving a kind of fictitious richness to the design; but it is indefensible when the architect leaves his sketchy drawing to be translated into working lines by others. The least he can do is to redraw them to a large scale himself, as only by this means can the errors of mistranslation be avoided, and we would impress upon the reader the value of measurements. There is much less chance of misinterpretation if detail drawings are carefully figured. We know an instance where stone window dressings and entablatures were entirely spoiled by reduction in the width of stone, the builder having taken upon himself to make the depth of stone agree with a course of brickwork less.

The “quantities” is also a hindrance to the direct transmission of the architect's design which the contractor is apt to interpret to his advantage. If any misconception of the design occurs, he appeals to the quantities, which is generally in favour of curtailment. The deficiencies of the workman are another break in the chain. He has had probably little technical or art instruction. The drawings he receives from the foreman have already been interpreted for him by the terms of the contract. It is the contract ideal that is set before the worker. Impeded he is also by other considerations. He receives, probably, only a tracing of the architect's drawing, or the foreman sets out on a board the intended detail. In a mechanical and perfunctory manner the material is converted and put together. Excellent as a workman, the artificer has little knowledge of style or the art which enables him to rise above his tools; the result is necessarily disappointing. The architect is less in touch with the manufacturing artist, who is often above receiving instructions, and prefers to assert his own individuality. We have thus far been speaking of those who submit their own designs to the contractor; and how very little the architect's own skill and artistic power

are actually translated into the materials of a building! But what is to be said of individuals who habitually depute others to do the work for them? The architectural draughtsman who ekes out a living by assisting competing architects by making perspectives is by no means always the invisible personage known as a “ghost.” Though behind the scenes, he somehow makes his presence known rather awkwardly, frequently by an objectionable course of action in case the design is favourably received, much to the discomfiture of the *soi-disant* author; at other times by demanding some share in the participation of profits. But as far as the actual workman goes, the architect is truly a phantom, for neither the worker nor the material know anything of him, so that the design and the building are irreconcilable.

The practice of delegating the artistic part of the work to another is, we are sure, too largely followed by members of the profession who have obtained some skill as specialists; the result is to dissociate in a most pernicious degree design from actual construction, and therefore the practice of art from the artist. In certain branches of art craft the architect finds it easier to depute to expert designers the whole responsibility, thus handing over all those portions of his building which should have unity of conception and aim. But is not this delegation of authority contrary to the whole meaning of art? It is impossible, perhaps, now to combine the faculties of artist and executant, but it is the duty of the architect to reduce the steps and shorten the labour of translating his design upon paper into actual material.

REPAIR OR REBUILDING.

WHICHEVER we like. We do not suppose for a moment that we can stay that process of natural decay which threatens every one of our noblest buildings; but it is idle to imagine that anything short of periodical reparation can prevent their destruction. To sit by and see stone by stone decay or become dislodged by wind and frost is the idea of those who would never do anything to an old edifice that would rob it of its antiquity, but would rather that it went piecemeal to ruin than do anything to avert a catastrophe, except, perhaps, putting up a shore or two. Some people appear to think that our old buildings, because they have weathered so many centuries, are indestructible by natural forces, forgetful that more modern erections have cost thousands to keep in an efficient state of repair. It is as well to remember there is a certain limit to repair. One feature after another may disappear or decay till a time comes when repair is past, and the whole structure can only be rebuilt or restored at an enormous sum—a fact which has been painfully brought to our notice of late in the restoration of edifices designed by one of the most eminent church architects of modern times, and by the serious and threatening state of the beautiful base of the spire of St. Mary's Church, Oxford. Custodians of our ancient edifices have a great responsibility; a timely appropriation of funds to the repair of piers, towers, and buttresses would save many a disastrous accident. In too many instances we know of, repair has been put off till it is too late to do anything but reconstruct the part at a great expense. Take, for example, a central pier supporting a tower. A stone here and there is fractured or decayed: instead of being at once reinstated, they are allowed to remain. Several years later the fractured stones multiply; a subsidence of the pier has taken place in one part, probably bringing the weight upon some portion of the external ashlar till it becomes apparent that the pier must be shored, the superincumbent

weight relieved by costly needling and collars, and the fractured part of pier made good. Often this operation has led to the entire rebuilding of the pier from a new foundation, a process that has been gone through in many of our cathedral churches. Where we can prevent this by timely reinstatement of new material, it is far better than the alternative of rebuilding, which is unsatisfactory both from an archaeological and architectural point of view. What does it mean but to destroy all the old, and rebuild stone by stone a new edifice that has not a particle of claim on our sympathy? Thus the spire of St. Mary's, Oxford, might have lost all its charm as an historic work. Happily it is in good hands, and although the architect, Mr. T. G. Jackson, says it has "gone to complete ruin in all exposed parts, as the pinnacles and parapets," we shall still have a careful and sympathetic rendering of the old detail, preserving the original beauty and charm of the outline of this spire, the "glory of Oxford," with its incomparable grouping of pinnacles, so far indeed as we care to take the new for the old.

We have many modern structures that equally demand periodical vigilance. The condition of the stonework of the Houses of Parliament requires watchfulness, and though much has been done in applying solutions and in reinstating decayed parts and pinnacles, other signs of decay are apparent in the external details. In several Government buildings where stone is largely used, such as the Royal Courts of Justice, periodical attention is required, especially in those features which project like cornices and stringcourses, and ornamental details like pinnacles. Particular attention ought to be directed to stonework cramped or doweled by metal, as portions are apt to become fractured by rusting of the iron, and to become dangerous by falling.

After stone, the necessities of iron construction demand the greatest of care. Many of our iron bridges are badly protected from the weather. Oxidation of plates and flanges and bolts is constantly weakening those parts subjected to stress, and we have from time to time serious failures in consequence. Repair in these cases is perhaps more difficult than substitution of new members; but an effective course is to protect by wood or asphalt casing the main girders, and to draw off the water from the floor beams. The embedding of girders in concrete is one of those questions that engineers will have to consider in the future, if only as a protection from external agencies. Possibly also it will be found to add to the strength of the girders by increasing the resistance to compressive and tensile forces. The iron roof has to be regarded also as a structure susceptible to the corrosive action of acids and moisture. Protective coverings and paints necessarily come within the category of repairs; yet we question whether our iron structures receive the proper attention in this direction. Many iron bridges on metropolitan railways have not received a coat of paint for several years. Various protective paints are advertised, some exceptionally good, and we have the recommendation of the French Marine Department of the value of tar-smoke painting, which has been found to prevent corrosion; but the same apathy exists as in the case of stone buildings: often companies will not repair till they are compelled to reconstruct. Railway structures, which are generally supposed to be models of economical construction, are often flagrant instances of neglect. In not a few instances the platforms are roofed over by flat coverings of zinc on wooden rafters or bearers. Whenever there is a sharp frost, the sheets contract or break at the joints, or the laps are so imperfect that the rain or snow descends in copious drops over the passengers.

It seems needless to say that flat zinc roofs should always be avoided, unless the sheets are of superior quality and laid in a scientific manner.

THE SOCIETY OF ARCHITECTS.

THE third ordinary meeting of the Society of Architects was held at St. James's Hall, Piccadilly, on Tuesday evening, Mr. E. J. Hamilton, vice-president, in the chair. The following three gentlemen were elected as members:—Lawson Robert Ford, St. Thomas's Chambers, Railway-approach, London Bridge, S.E.; Nathaniel William Harrison, 51, Pembroke-street, Cowley-road, Oxford; and Herbert Edmund Knight, 129, Cheapside, E.C.

The following paper was read by Mr. R. OWEN ALLSOP, entitled

SOME FIRST PRINCIPLES OF ARCHITECTURAL DESIGN.

The lecture was illustrated with more than forty limelight views of typical buildings of various styles and countries. The author remarked that to those possessed with a spirit of inquiry into the genesis of things, it must often have occurred that certain broad principles are the first cause of all beauty of effect in architecture of whatsoever style of design. While there are principles pertaining to each individual style, there are others that equally concern all true and noble architecture. Of these former—what may be called "particular rules" as distinct from general laws—we have heard much since the days of the revivals; but little has been said concerning those great principles that lie at the very root of all true architectural effect. Principles of style are indispensable; but a knowledge of these alone will not insure beautiful design, even in the particular style to which such rules apply—that is to say, they will not insure original and intrinsic beauty. At the most they will only guarantee a correctness of resemblance to some ancient model or prototype, and the fuller the knowledge of principles of style, the closer will be this resemblance. First principles of design, on the contrary, go to the root of matters. They discover the fountain-head of architectural beauty. While the principles of style assist us only in the machine-like production of the beautiful, an earnest study of first principles will give an insight into the method of producing intrinsic beauty and that which is novel and original—so far, indeed, as anything can be called new and original. Never was there a time in the whole history of architecture when a broad study of the subject of architectural composition would be of so much benefit to the architect. So many different styles are practised at the present day that an insight into the great principles of design is as useful to the architect as the mariner's compass to the navigator, or the pole star to a traveller across the trackless desert. In a rushing, changing and bewildering age, with ever-varying tastes, it is a beacon-light indicating a sure and certain haven of refuge. He would be bold and presumptuous indeed who pretended to be able to point out a royal road to successful design either by principle or otherwise, and in one short hour to unveil the mysteries of recondite primary laws and first causes, that have taxed the expressional faculties of the most profound thinkers. All that I hope to do this evening is to draw your attention to the existence of these first principles as they affect architectural composition, and so perhaps to initiate further thought in the same direction. Much that we can feel in art and design cannot be communicated. Were it otherwise there would be no art. Much, too, cannot be directly taught: we feel by sympathy that which the writer or speaker strives to express. Thus, in reading the works of those authors who have taken a high standard in writing of architecture as an art, we glean, rather than reap, golden grains of truth. Such eternal truths—for so we may call them—are rather felt than spoken; and thus we have the highest first principle of design—one which for want of a better term we call feeling—a purely ethical matter which, possibly, has as much to do with the heart as the intellect. This vague, ill-defined principle we call feeling is a point of the greatest importance in architectural composition. It insures enthusiasm, earnestness and sympathy in design, and is as necessary an attribute of the

designer as of the craftsman who executes the work. It means a love for and an absorbing interest in one's work. Nothing really great can be accomplished without it. It is to be questioned whether there can be this enthusiasm in the mere copier of old design. Laborious imitation is always painful and tedious, and it is only when ideas fresh and novel—or apparently so—well up, so to speak, at the fountain-head, that true joy in design is experienced. We may therefore lay it down as a great first principle that no noble design is the work of an unsympathetic hand or hard heart, howsoever keen the intellect. Enthusiasm for the cause of the building is evidenced in all great architectural creations. It is the first of which we are sensible in contemplating any great work of architecture. It leads to the expression therein of a spirit of life. "All things are noble in proportion to their fulness of life," it has been said. In every great building there is a vigour of both design and execution that symbolises power and force, and may be perhaps regarded as crystallised energy. We rarely find this expression of living energy in any works produced on the principle of slavishly copying old examples. What is vigour in the original, is feebleness in the copy. Enthusiasm and the life and vigour that are its resulting expression, are rather matters of architectural ethics, and the result of moral forces, than laws of that grammar of which architectural composition is the practical exponent. To pass on to more matter-of-fact principles, we find that there are great laws of contrast and gradation—principles that not only underlie all artistic work, whether in music, literature, the drama, art, or architecture, but are of the essence of all effects that have been in the heavens or the earth since light and darkness were divided. Here, then, we have first principles indeed, and such as very evidently affect architecture of every age and style. Contrast and gradation are the soul of all artistic effect, and embrace many other minor principles, such as concentration, radiation, breadth, and even proportion itself. To obtain harmonious contrasts and noble gradations is, even if unconsciously, the great effort of all designers and composers. In architecture we may have contrast of light and shade, of form, of line, and of material and colour. Let an architect rather than test his design as to its resemblance to some old model, ask himself the question, "Have I got sufficient contrast in this or that feature?" and again, "Are my studied gradations of light and shade, of form or line, &c., beautiful gradations?" "Do I want more contrast, or a bolder or more harmonious contrast here?" may be a method of self-examination applicable to outline, to the grouping of parts, to details and to mouldings. A section of a capital or archivolt does not appear satisfactory. "Are the contrasts of square to round, of large to small member, of light projection to dark recess sufficiently pronounced or too much so?" will be a question, and a far more pertinent question for the striver after new beauties of effect than a mere reference to some old example or book of examples. The one is the method of the ape-like imitator; the other that of the thinker and true designer. In the same way a design may be overhauled with reference to gradation. "Are all curved forms and lines and surfaces noble and beautiful curves; are all studies to produce effect by graduated design really noble and interesting gradations?" "Is there a false note in the scale?" Such and numerous similar questions will at once occur to all. More important almost than contrast and gradation is the law of domination and subordination—more important because affecting the massing of the great features of a work of architecture. Domination and subordination simply mean the giving to each feature its due weight and importance. To take a homely illustration, the advertising poster or trade handbill shows the printer's appreciation of the rule of domination and subordination in giving due prominence to certain words. A newspaper contents bill is another illustration. Any indispensable conjunctions, &c., are printed in comparatively insignificant type, whilst news of importance is prominently displayed. In architecture relative weight must be given to each feature. Some hold that the Belfry of Bruges is a composition defective by reason of the tower dwarfing the building. As a matter of fact, the tower with its clock and beautiful carillons being the chief end and aim of the whole building; this

would seem to be a fine example of a just appreciation of the law of domination and subordination. In every fine work of architecture there is to be noticed some dominant feature, such, for example, as the dome of St. Paul's and the Bell Harry Tower at Canterbury, both being objects marking the central portions of their respective cathedrals. A nice appreciation of this matter is requisite for attaining a good effect in designs, where the proper position of a dominant object is not so plainly evident as at the crossing of a cathedral. It is by means of due regard to this principle of domination and subordination that unity is attained in a building comprised of a multiplicity of features. Unity in multiplicity is another great first principle in design. Unity without multiplicity of parts is not difficult to attain. There is unity in the Parthenon or any old temple of such simple composition, as there is unity in the pyramid. In such simple masses there cannot but be unity; in a complicated building, covering a wide area and devoted to a variety of purposes, unity must be sought in a deliberate apportioning of size and importance to each feature; and if this be successfully done a mediæval monastery has nearly as perfect unity as a Greek temple or Egyptian pyramid. Lincoln has unity of effect, all its main features are in harmony duly related and proportioned one to the other, its great central tower dominant, its western towers in due subordination; and so more or less with every minor feature. Durham, Lichfield, and Canterbury—most of our old English cathedrals are in perfect harmony in this respect. Interiors are necessarily so—some more, some less. The interior of the church of St. Ouen at Rouen is a perfect, self-contained unit. In respect to domination and subordination and unity of effect, therefore, we have here another matter for self-inquiry on the part of the architect. "Has my design unity; is it undeniably one in effect?" "Is there a due and harmonious relation between feature and feature, or are they all more or less of similar value?" "Can I by subduing this part and giving greater prominence to that obtain a better and nobler effect?" "Is the composition, like a feeble picture, 'all over alike' as respects the grouping of features?" "Is there, in fact, insubordination or over-modesty among the members comprising the building?" Such questions, moreover, it should be observed, can be applied to the outline and main grouping of features as well as to the most minute detail. There is not a moulding or a fragment of carving in a building that this principle does not affect. In Classic or Gothic architecture the same inexorable law applies. Much of that otherwise mysterious attribute of architecture—proportion—has to do with this law of domination and subordination. To give a feature its due weight and prominence is evidently to "proportion" it. Of proportion as a principle I do not propose to speak. It would seem to be rather the resultant of the application of other principles than a principle itself. This much may be said—that to all holding that proportion must, should and can only be infinitely elastic, the hard and fast triangular and other principles of some theorists are peculiarly revolting. An important first principle is concentration. This law of design affects both detail and the larger matters of architectural composition. Concentration is the antithesis of diffusion. It signifies the throwing of one's whole energy and strength into certain parts of a design. It insures the observance of the rule of ornamenting construction—a principle of architectural design so well known that I make no special mention of it here, my sole object being to draw attention only to commonly neglected first principles, and to ignore as platitudes those well-recognised laws which compel honesty of construction, proper use of materials, suitability of design, &c., &c. Want of knowledge of the power of concentration in design leads to that neglecting of necessary features and restless creation of so-called "ornament" for its own sake—the chief characteristic of the incompetent designer. Half the battle in architecture is the concentration of work upon necessary features, leaving plain wall-surfaces to take care of themselves, which they very well can do. In the work of a tiro we see how he slurs over necessary features, as, say, a doorway, and feverishly hastens to fritter away with meaningless "ornament" all the broad surfaces of adjacent plain walling. The true architect, on the other hand, will spend much time and thought on the doorway, its arches and mouldings, and on the

door itself, with its panels and fittings, leaving the plain wall surface as a natural contrast. It is to this principle of concentration that we are indebted for the grand portals of Mediæval cathedrals, and, indeed, for every feature in a design, in whatever style of architecture, where concentrated thought and persistent endeavour are evidenced. The distribution of light and shade—architectural chiaroscuro, so to speak—lies at the root of beautiful effects in building. It is the great principle of Mr. Ruskin, who speaks of "broad sunshine and starless shade," and instances Giotto's Campanile and the Grand Canal façade of the Doge's Palace at Venice as examples of beautiful disposition of light and shade. The latter building may also be shown as a grand example both of contrast of void to solid, and a concentration of work in one particular portion of a design. A crucial test for an architectural composition with respect to this disposition of light and shade is moonlight. Full moon on a building like the Doge's Palace cannot but show the design in another beautiful aspect. And so with all other good compositions. Where, however, the main massing of features is at fault, the moon reveals the errors. Few modern works of architecture can withstand this test, as few faces are so beautifully modelled as to be proof against the searching rays of the electric arc-lamp. In moonlight the obscuration of the details—which become blurred, indefinable, and mysterious—leaves us only the outline and general composition with which to judge the work; and as the lights and shadows are hard and exaggerated—dead black and glaring white—defects in their disposition are more easily detected. To obtain a beautiful and graceful disposition of light and shade the arrangement of voids and solids of a building must be carefully studied, that no harsh shadow or glaring light breaks in discordantly upon the general scheme. To obtain a grand distribution of light and shade, deep recesses, and flat unbroken wall surfaces, as contrast, are required. An indifferent climate, thin walls, abundant plate glass, and local by-laws, are not conducive to fine effects of light and shade in architecture. An Egyptian temple under a blazing sun is required. Among notable bold effects of this kind, in internal composition, the triforium of a cathedral may be instanced, the blackness of these sombre arches contrasting so finely with the brilliant light in the clerestory windows. The interior of almost any cathedral will illustrate this. A fine effect of this kind is to be witnessed in the unglazed window openings across a cloister garth. This care in the distribution of light and shade in works of architecture has much to do with the ultimate attainment of that breadth of effect—which is so much to be desired and so seldom attained in modern buildings. "Breadth" in art matters seems capable of several slightly varying definitions. In pictures it seems to be recognised as such a distribution of light and shade as shall give the reverse of that spottiness of effect observable in drawings faulty as to chiaroscuro. In architecture the term may be applied more widely. A building with many different kinds of materials will lack breadth as compared with one where fewer and simpler materials are employed. Anything petty and frittered will negative broad effects, and especially the want of feeling for the value of plain wall surface. Variety we know to be charming; no need, therefore, to put forward variation in parts and methods as a principle: but given this fact, something would seem to require explanation, seeing that repetition of similar features and monotony in surfaces are evident attributes of all architecture. This, apparently, is to be explained by the fact that the grandest and noblest of all architectural effects of gradation is the perspective view of what on a geometrical elevation may be simple repetition. A colonnade, as of a portico, presents in perspective a glorious effect of gradation. A receding arcade is equally fine. Again, what is geometrically a plain, even superficies never, as is well known, presents anything but a varied gradation of light and shade. So, too, a diapered surface, as in the spandrels of arcade arches, monotonous enough in its geometrical representation, becomes in perspective a surface piquant with beautiful effects of graduated and broken light and shade, each diaper being presented to the eye in a different form and varied tone. Thus nature aids the crude endeavours of man, and transforms a dull, lustreless stone into a sparkling gem. In a similar way parallelism in

a geometrical elevation, which properly speaking is monotonous in effect, becomes, in perspective, divergence. This may be seen in any building, and is a notable effect in a long and lofty interior such as that of a French cathedral. Radiation or divergence is an important principle of design. It is plainly an element of the beautiful in ornament, and is to be particularly observed in vaulting, notably in such fine examples as that of the Chapter House at Westminster. We see the beauty of radiating lines throughout nature—in flowers, ferns, leaves, and grasses. An architect could frequently improve details, such as capitals and other carvings, by calling to mind this principle of radiation, and asking himself whether there is an ignoble weakness or expression of power in the radiating lines of his design. Radiation would seem to express power. Power must proceed from point or centre. In a mass of radiating lines we see expressed the spirit of the same effect as that which attends an explosion, as in the firing of a cannon, when from the muzzle of the gun rolls away an ever-widening cloud of smoke. So, too, a similar impression is conveyed by the ever-extending circles on the calm surface of a lake when we cast a stone into the water. Power, proceeding from a centre, is in all these cases typified. In reflecting on first principles the architect will discover many minor ones not mentioned this evening. I have confined myself to those of the widest significance, and if the suggestions made should lead to your prosecuting individual inquiry in the same direction, I shall feel that my endeavours have not been in vain. During recent years great progress has been made in architectural design; but something seems lacking in respect to originality of composition—in respect, perhaps, of insuring originality of composition that may be really beautiful. Too great attention to style, and too little regard for principle, would seem to be the cause not only of much insipidity of design, but also of much positive ugliness. One may continually see buildings wherein it is but too evident that little regard has been paid to any of the eternal laws of beauty in concrete substance. We are only able to conclude that there are not a few architects living and working in blissful ignorance of even the existence of such things as laws of architectural composition, and wholly unaware that there are beautiful effects peculiar to architecture—men who continue absorbed in petty matters of detail. Totally oblivious of the larger matters of outline and the dignified and beautiful massing of main features, they apparently cannot grasp the idea of a building as a whole, but habitually regard it with the narrow eye of a decorator. Any such once awakened to regard a building as a building, and not as a screen or museum for the display of petty fancies, quaint architectural conceits, and odd fragments of ornamental carving, would surely perceive that the noblest attributes of architecture must necessarily be beautiful effects peculiar to architecture as it presides in the street or square, or stands forth from the country side. Were architecture a matter solely of an exhibition of pretty windows, gables, and elegant mouldings, then we could see all the beauty of architecture in a museum. Modern architecture has made rapid strides, but it cannot be said to be noteworthy for its large and noble effects. The neglect of the study of composition—that is to say, the grouping of features and the massing of great parts until unity is attained—would seem to be the great error of the time. A taste for, and an inquiry into, first principles would go far to remedy this.

Mr. WILLIAM ALLPORT moved a vote of thanks to the lecturer.

This was seconded by Major LESLIE, R.E., and supported by Messrs. A. G. SMITH, W. H. MAY, ELLIS MARSLAND, and ALFRED HOWARD, and was carried by acclamation.

PRIZE WORK AT THE ROYAL ACADEMY.

"GRATIFYING to the authorities, creditable to the students, and full of hope for the future," were the words used by the President of the Royal Academy, Sir Frederic Leighton, the other day concerning the prize work which has been on view this week at Burlington House. "The average of the productions, taken as a whole," he said, "was excellent." A very large assemblage of members of the Academy were present, and the chairman, before distributing

the honours to the prize-winners, told the students that this view was not only his opinion, but the united judgment of his colleagues. Mutual applause followed. In the face of such an expression of opinion, however, little remains to be said—indeed, it is reckoned sufficient to silence criticism. The impression notwithstanding which we find forced upon us, after examining the show, is that the majority of the competitive works are extremely poor. Certainly the architectural productions at best can but rank as quite unworthy of a national institution professing to cultivate the art of architecture, and no more severe comment could be made on the absence of all helpful influence upon the students' work by the architect members of the Academy than the building designs exhibited on this occasion. All the recent irresponsible chatter about "Architecture as a profession or an art" seems mere sounding of brass and tinkling of the cymbal while the practical outcome of the schools of Burlington House, with their R.A. visitors, only produces such class-work as is here shown, exhibiting it, moreover, as the best of its kind done during the year. Two or three of the architectural prizes were not awarded at all, and even in the Creswick Landscape competition, for which there were several entries, the second prize was not given, so that we can hardly see where the occasion for congratulation exactly finds a place.

The following is the prize list:—Landscape painting.—A Trout Stream—Creswick prize (£30), Siegfried Makepeace Wiens. Painting of a figure from the life (open to male students only).—Silver medal, 1st, Lawrence Edward Koe. Painting of a head from the life.—Silver medal, 1st, Isaac Snowman; 2nd, Edward Spilbury Swinson. Painting of a draped figure (open to female students only).—Silver medal, 1st, Isabel C. Pyke-Nott; 2nd, Florence Hannam. Cartoon of a draped figure.—Mary Magdalen at the Sepulchre, St. John xx. 1.—Silver medal and prize (£25), Lawrence Edward Koe. This figure is probably the best; but the drawing of the hands is a great blot in the composition, which, as a whole, is wanting in intensity, and evinces a lack of appreciation of the character. The woman who was sufficiently fired by love and zeal to risk the dangers of the night and face the rough reception only to be expected from Roman soldiers eager for the safe custody of their charge, was little likely to stand crouching, helplessly bewailing, supporting herself against a rock, as is here delineated! Design in monochrome for a figure picture.—The Judgment of Solomon, 1 Kings iii. 24-27.—Armitage prizes, 1st (£30 and bronze medal), John J. Liston Shaw; 2nd (£10), Harold Edward Speed.

Design for the decoration of a portion of a public building.—Autumn—Prize (£40), Beatrice Emma Parsons. None of the designs for this prize are, correctly speaking, decorative work, which is manifestly not encouraged or properly understood at the Royal Academy. The prime restrictions of flat treatment and silhouette drawing as leading principles always seem to be ignored, and, naturally, it would be so with portrait and cabinet picture painters, such as are out and away in the majority at the R.A. Miss Parsons' work, besides being treated too naturally for mural ornament, is wanting in grouping, seeing that the figures remain individuals almost entirely, and either one could be removed without being necessarily missed. The colouring of the work, too, seems unsatisfactory, except the kneeling woman to the left, in green, engaged with the yellow-haired child.

Set of six drawings from a figure from the life (open to male students only).—1st prize (£50) and silver medal, Frederick Dudley Walenn; 2nd (£25), Herbert Edward Harley; 3rd (£15), Lawrence Edward Koe (disqualified owing to having received a superior prize in the same competition before); 4th (£10), Leonard Watts. Drawing of a head from the life.—Silver medal, 1st, Edith Lydia Clink; 2nd, Shirley Charles L. Slocombe. Drawing of a statue or group.—Silver medal, 2nd, Hannah Myers. Model of a design.—Astranax hurled down from the ramparts of Troy in the presence of his mother, Andromache—1st prize (£30), David McGill; 2nd (£10), Charles Beacon. Set of models of a figure from the life (open to male students only).—1st prize (£50) and silver medal, David McGill; 2nd (£20), Sidney Herbert Physick. Model of a bust from the life (open to female students only).—Silver medal, 1st,

Edith Bateson, the only competitor in this division. Model of a design containing figure and ornament.—Frieze for a chimney-piece.—Silver medal, Charles John Allen. Design in architecture for a small country church for a scattered moorland parish—the Travelling Studentship and £60 is awarded to James S. Stewart, who scarcely wins the prize, so closely is he followed by the design marked 182. The subject is a small one, comprising, besides the little moorland parish church, a Sunday school detached from the church, and a shelter for carriages or carts bringing worshippers from a distance. Mr. Stewart makes a feature by placing a squat conical spire over the tower-like gateway located between the school and the shelter, the church being placed in the centre of inclosed plot. This tower reminds us of some prize designs for mountain churches, published about twenty years ago by Messrs. Paley and Austin, and we hardly think the Seddingesque influence which other features in the design indicate harmonise with the sterner type of work which mountain or moorland buildings necessitate. The Flamboyant traceries and unprotected external doorways here shown are not appropriate for exposed situations. The church plan evinces no special knowledge of church planning, and the canted sanctuary in a sort of apse would be ugly enough in execution. No. 182, the second best design, has a thin, spire-capped tower, belfry and all. The school is connected with the church by a covered way, and, presuming that the site is a hilly one, a shelter is made very picturesquely at a lower level under the school-room. This design is "Late" in style, and is not very suitable for the presumed position, where half-timber work would hardly look at home. The other three designs do not call for any remark, as they clearly were not in the running. Probably if they had been prepared in some out-of-the-way country office they would have been quite as good, and this is not over-stating matters, relatively speaking.

Only one plan was sent in for the infectious hospital, and that not being equal to the standard contemplated fails to win anything. For a set of architectural drawings of the north porch of St. Paul's Cathedral a silver medal, 1st, was given to Robert Alex. Reid, and a second medal to Henry Ernest Kirby. For a set of drawings of an architectural design (Lower School), Harry Percy Adams takes a prize of £10. The Landseer scholarships in painting and sculpture of £40 a year each, tenable for two years, given for the best work done in the examination for passing into the second term of studentship, have been awarded—in painting to Reginald Arthur and George Spencer Watson, and in sculpture to Sidney Herbert Physick and Lawrence Edward Koe.

A SANITARY MUSEUM, HIGHGATE.

THE Hornsey Local Board, Highgate, have opened a Museum of Sanitary Appliances which ought to be a lesson to other local boards. To the engineer and surveyor of the Hornsey Local Board, Mr. T. de Courcy Meade, M.Inst.C.E., the inception, or at least carrying out, of this scheme is, we believe, mainly due. Last week the Lord Mayor formally opened the museum, which contains a most instructive and comprehensive collection of sanitary appliances. Manufacturers were invited by the Local Board to submit specimens, and the response has exceeded the expectations of the promoters. The museum consists of seven rooms, having a floor space of nearly 5,000sq.ft., and the rooms are well lighted and warmed. The most valuable and instructive part of the museum are the annexes in which materials are tested, the cement testing apparatus being very complete. The materials are selected and prepared with great care, briquettes are made and tested, besides stoneware pipes, bricks, water fittings, macadam, &c. In the plumbers' workshops several useful sections of plumbing arrangements and models in glass for showing the action of liquids in soil pipes, &c., are exhibited, besides several kinds of flushing tanks, which are shown in operation. Plumbing classes are being organised, and lectures will be given on sanitary science.

Glancing over the varied contents of the museum we find in Stand 6 a select and typical display of ventilating appliances presented by Messrs. Robert Boyle and Son, Limited, of Holborn Viaduct, the well known sanitary engineers. These include an air-pump ventilator

for the ridge of roof, which is now so well patronised by the profession, an external pipe ventilator suitable for soil pipe or a system of house drains, an air-pump drain and sewer ventilator, and a galvanised iron fresh-air inlet with mica flap, an inlet which every house should be provided with. A bronzed cast-iron ventilator for chimney-breast is a useful self-acting flap arrangement. Messrs. Hayward Brothers and Eckstein, Union-street, Borough, in Stand 39, have an assortment of their ventilators, as the "Silent" and "Self-acting," and inlet louver ventilators. These are intended for fixing in air-extraction flues, chimney-breasts, and outer walls, and are made with ornamental bronzed fronts. One of the best exhibits in the patented closet arrangements is presented by Messrs. John Knowles and Co., of King's-road, St. Pancras. The "Presto" double-action, self-flushing cistern and seat, adapted to the Woodville pedestal wash-out closet, is already favourably known. We described its advantages and self-cleansing action lately, and can only say that this model closet-seat and cistern has only to be examined to be approved, and is suitable to every class of dwelling, and especially to public schools and hospitals. We notice an excellent white earthenware wash-out w.c. basin and lavatory. Improved siphon traps, yard gullies, and stoneware channel-pipes with special safety joint are shown in models.

Messrs. Doulton and Co., Lambeth, are represented on several stands, and their exhibits include specimens of their white earthenware valve closets, the "Simplicitas," in decorated blue and white and other wares, with washdown basin and trap in one piece, a hinged seat fitted with water waste-preventing cistern; also the Queensware "combination closet," with self-raising seat, &c.; models of stoneware "Kenon" disconnecting trap, stoneware and gully traps. In Stand 37 several improved forms of stoneware intercepting traps, with inspection inlets and ventilating arrangements, are exhibited; besides a 9in. stoneware tested pipe in three lengths, fitted with self-adjusting joints under water test—a good example of a stoneware drain pipe. Damp-proof courses in stoneware and other goods are to be seen, including a stoneware invert block and several specimens of terracotta and blue Staffordshire bricks, silicon treads for steps, &c. Messrs. Adams and Co., Little Queen-street, Westminster, present an automatic flushing cistern of good design; the Albion Clay Company, Euston-road, the "Paragon" stoneware pipe joint; Messrs. Ashton and Green Iron Company, St. Mary Axe, sanitary wash-down closets, lavatories, Roman and other baths, showing improvements, and a variety of waste-preventing cisterns and ventilating fittings too numerous to mention; while further on we must not overlook the important stand (130) of Messrs. Thos. Crapper and Co., whose sanitary traps for disconnection, channel pipes, and gully traps are well known and appreciated. Messrs. A. Kershaw and Co., Lancaster, the London Galvanised Iron Co., Walter Macfarlane and Co., Glasgow, and J. Stiff and Sons, Lambeth, are also exhibitors.

VENTILATION.

A PAPER on the above subject was read at the Royal United Service Institution, Whitehall, on the 7th inst., by Captain George S. MacIlwaine, R.N. (Ret.), Travelling Inspector to the Board of Agriculture. In the course of his remarks the lecturer said that the subject was one of such vital importance that it was impossible to over-estimate it, and in support of this opinion quoted an authority, who states: "There is no subject of greater importance to the welfare of human beings than ventilation, or the proper supply of fresh air. Air is a necessity of life, and when it is remembered that no one can abstain from inhaling that which immediately surrounds him, whether it be pure or not, the importance of the subject becomes apparent. Bad food or bad water can be rejected, bad air must be used." Go where we will, said Captain MacIlwaine, into halls, churches, theatres, hotels, private houses, what do we find? Either that there is absolutely no provision made for ventilation, or that the arrangements made are quite inadequate to the requirements of the place or the people occupying it. It is, therefore, of the last importance that the matter be thoroughly understood, and proper provision made for what

is so essential to well being. But immediately the question arises, How much pure air must be supplied?—how many cubic feet per hour per head? It would appear to be a matter easy of decision, and yet what extraordinary differences of opinion do we find concerning it. Here is an authority, mark you, who writes and publishes on the subject, who may be presumed to have some knowledge concerning it—and who says: "A man in health requires not less than 150 or 160 cub. ft. of fresh air per hour." In the "Text-Book of Human Physiology," by Lambois J. Stirling, it is laid down that 3,000 cub. ft. per head per hour are necessary to counteract the effects of the CO₂ manufactured by the breath. We have here some startling differences of opinion. If 150 cub. ft. are enough, it is clear 3,000 ft. are too many, and *vice versa*. About 15 cub. ft. of air pass through an average man's lungs in an hour; the expired air contains about 4.4 per cent. of CO₂, or carbonic acid, as it is popularly called—i.e., a man manufactures about 0.66 cub. ft. of CO₂ every hour. Ordinary air contains 0.04 per cent. of CO₂, or four parts in 10,000. For health the air we breathe must not contain more than 0.06 per cent. of CO₂, or six parts in 10,000. Dr. C. Hunter Stewart, of Edinburgh, has recently made some experiments in the matter of the analysis of the air in different places in Edinburgh. He mentions one place where 63 parts of carbonic acid in 10,000 were found—that is, more than ten times what ought to have been. In other churches he found from 20 to 50 parts in 10,000. Knowing approximately the amount of air required, the next question is, How can it be provided? And here again we find the widest divergence of opinion among the experts. For instance, Mr. Tobin, the inventor of Tobin's pipes, says: "It is unnecessary to arrange for outlets for foul air, all that is necessary is to admit a sufficient amount of pure air." Dr. Macdonald says: "The more we study the subject, the more we perceive it to be necessary to make provision for the ingress of fresh air, as well as for the escape of that which has been rendered impure." Referring to mechanical ventilation, Captain MacIlwaine said: "To force air into a place we desire to ventilate is to dilute the foul air of the interior; to extract, is to get rid altogether of the foul air, when a supply of pure air equal in amount will take its place. What I would call a system of ventilation would be an arrangement which would provide for the supply of the necessary amount of fresh air, and for the removal of an equal amount of fouled air. Provision must be made for supply and exhaust in equal quantities." Captain MacIlwaine made mention of the experiments made by the Sanitary Institute at Kew in 1878, historically known as the "Kew Farce," instituted for the purpose of determining the respective values of certain ventilators, when, as the result of their labours, the committee issued a report in which it was stated that an open pipe was the most reliable ventilator, and that other ventilators, therefore, need not be employed. The lecturer stated that one of the committee had told him that these results were more than verified, and added, in refutation of the idea that a simple opening through the roof could possibly secure proper or reliable ventilation: "One word here as to the prevalent, but, as I understand it, mistaken notions which are current as regards the principles of ventilation. In a room, or other like place, the heated air rises; the general idea is that in order to get rid of this heated air it is only necessary to open communication with the outer air at the top of the room, and that it will there escape; but this is certainly a mistake, as is well pointed out by Mr. Chalmers, of Glasgow, who, in a lecture delivered at Glasgow in 1890, said that when under these circumstances the heated air met the outside air, it merely shook hands with it, as it were, gave out its latent heat, increased its specific gravity, and then fell. Another point in this connection is this: Where are the impurities to be found in a badly-ventilated compartment? There is a very general idea that CO₂, being heavier than air, falls, and is always to be found near the floor or low down, and arrangements are sometimes made to exhaust the air from this part in consequence. There can, I think, be no doubt that it is quite erroneous to suppose that the CO₂ falls. I have the opinions of two professors of chemistry on the matter, and both say that, owing to the laws of the diffusion of gases, the CO₂ in any place, however badly ventilated, will be found to be

practically equally distributed in all parts of the place." In conclusion, Captain MacIlwaine recommended that ventilators should be as numerous and as large as possible, and that where mechanical ventilators were used, it should be made sure that they really draw the foul air from the places they work in, and that they are not employed merely to churn the air in their immediate neighbourhood. A discussion followed, in the course of which a representative of Messrs. Robert Boyle and Son made the following remarks: With respect to the quantity of air that should be supplied per hour for each adult in a building, the system of ventilation in use must determine that. With the old-fashioned method, plain open pipes, with a cover on the top to keep out the rain, the downward current usually found to exist in these shafts, and which cooled the ascending vitiated air, forcing it down again to be rebreathed, it was necessary to make very ample provision indeed to dilute to a fairly healthy standard the vitiated air in the building, which was not permitted to escape at the proper level—that is to say, above breathing level—but had to find its way out as best it could in other directions. With the improved methods of ventilation now employed, the hot, vitiated air, which naturally ascends to the ceiling, is drawn off as rapidly as it is generated, and is not permitted to return to breathing level again, so that pure air, supplied through the air-inlets provided, is always maintained at that level. Under these conditions—which, with the Boyle system of ventilation, are guaranteed—150 to 200 cubic feet of air per hour per person are amply sufficient for all ordinary requirements. The method of admitting air referred to by Captain MacIlwaine as the invention of Mr. Tobin is very old indeed. The library at the British Museum was ventilated on that principle when built, and many other buildings. This method of admitting air also formed part of the "Boyle System" for many years before Mr. Tobin's name was known in connection with it. With regard to the experiments conducted at Kew in 1878 by the Sanitary Institute of Great Britain, the *Times*, which was the organ selected by the Institute to make public the results, condemned the experiments in the strongest manner, stating that "the method of testing was incorrect, and therefore the tests are valueless. . . . Neither in the case of either of the cowls nor the tubes was their true value as extractors ascertained." This opinion was endorsed by all the scientific and other journals which noticed the experiments. Sir Douglas Galton, President of the Sanitary Institute, referring in one of his published works to the utility of open pipes as ventilators, says: "In consequence of the numerous causes of disturbance enumerated above, this method of extraction, when applied to a house, cannot be relied on to act on all occasions with certainty as an extraction shaft." This condemnation of the open pipe as a ventilator is endorsed by all scientific men who have studied the matter, and is confirmed by the various experiments conducted in this country by Mr. Hellyer and other practical experts. Mr. Smaile, the engineer to the Water and Sewerage Board, Sydney, Australia, to quote from an article which lately appeared in the *Building News*, "instituted lengthened experiments with a view to test the exhausting power of the different ventilators submitted, but like the experiments carried out by the Sanitary Institute at Kew, the results were of an inconclusive nature, for although the majority of the ventilators were found to be better exhausts than a plain open pipe, yet when tested against each other in certain situations, conflicting results would be obtained when tried in other positions, though in each case the ventilators were fixed clear of all external obstructions. These tests afford an additional proof that it is impossible to correctly ascertain the comparative exhaustive power of different ventilators, especially when of a small size, by simply placing them on the tops of pipes in certain situations, and testing them with an anemometer or the water test, and they endorse the results which have invariably been obtained from experiments carried out at different times in this country." The late Mr. William Eassie, C.E., who formed one of the committee who tested the ventilators at Kew, was in the habit of using exhaust ventilators regularly up to the time of his death, and we supplied him with many hundreds of the air-pump ventilators for the ventilation of soil-pipes, &c. In one case—a nobleman's mansion situated in the North of England—Mr. Eassie stated

that, in deference to the desire of his client, no soil-pipe ventilators were used, the plain open pipe only being employed. The smells, however, at the ground level were found to be so intolerable that air-pump ventilators had to be applied, when the smells at once ceased, and did not recur again. This is only one of thousands of instances that might be quoted to prove the superiority of a properly-constructed exhaust ventilator over a plain open pipe, and which endorses the statement made by Captain MacIlwaine respecting the experiences of Mr. Chalmers, of Glasgow, who found that a simple opening through the roof merely permitted the cold external air to descend. This is the experience of all who have ever tested a plain open pipe in a heated building, it being almost always found necessary to close up such a pipe to stop the disagreeable and dangerous draught. The tests made by the Sanitary Institute could not, in any case, permanently determine either the merits or demerits of exhaust cowls as compared with an open pipe, as improvements are constantly being effected in these ventilators, and those in use to-day would be quite different from the ventilators tested by the Institute, even though the experiments might have been extended up to a recent date; therefore for all practical purposes they could prove of no value whatever, as they could only profess to demonstrate what was the value of certain ventilators at one time, but not what their value is now, which, after all, is the only thing the public is concerned with. With respect to mechanical ventilation, the system applied at the New London Law Courts is a notorious example of the failure of that method of ventilation to give satisfactory results, though everything that money and skill could do to make the mechanical ventilation a success has been tried.

A vote of thanks was accorded to Captain MacIlwaine at the conclusion of the proceedings.

JAPANESE STENCIL DESIGNS.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

MR. ANDREW W. TUER, F.S.A., has just published a very practical volume entitled "A Book of delightful and strange Designs, being One Hundred facsimile Illustrations of the Art of the Japanese Stencil Cutter," and by permission of the Leadenhall Press, Limited, we are enabled to present our readers to-day with a selection of patterns reproduced to a smaller scale, among our lithographic illustrations. As a frontispiece a real Japanese stencil plate is added, thus enabling the reader to realise exactly how such extremely delicate design is managed in decorating the cotton or crepe fabrics which are so largely used by the Japanese in the costume of both men and women. These plates are generally made, Mr. Tuer tells us, of disused documents, for the thrifty children of the Luminous Land waste nothing; and these plates form part of the working tools or stock-in-trade of the journeyman printer or decorator of cotton goods. The stencil plates made for sale in European markets by Japanese speculators are, like most things, manufactured simply to sell, and not for use, generally of a very ordinary and inferior kind, and, as a matter of fact, genuine stencil plates in Japan are no more a marketable commodity than the holed loom cards or engraved wooden blocks of English colour printers are marketable at home. The ceramics, enamels, metal-work, and general ornament of the Japanese have already been described, illustrated, and ingeniously analysed by several capable writers from various points of view, while the fashionable craze for Oriental goods of a cheap character has tended to weary the public taste for a time in so far as it is superficially interested. To the student of design and lover of real art-work the care for design of intrinsic merit remains as keen as ever, and the true artist is ever ready to acquire knowledge and examine beautiful things. This being so, we are not surprised to learn that Mr. Tuer's pattern pages have already met with an appreciative reception, and his fanciful inscription in which he dedicates his book "to that most capricious, never-to-be-understood, weathercocky, provokingly incorruptible, and absolutely necessary person, The Gentle Reader," is indicative of the good humour of the author. He does not confine his attention to such light fancies only, for he tells us several practical things. Thus he tells how the cobweb-like threads of silk which are introduced into the more

delicately designed pattern plates are manipulated, stretching as they do at regular intervals from top to bottom and from side to side, forming a strong net of so fine a texture that the stencil brush ignores them and leaves no mark of their presence. As they are incorporated with the paper substance, it seems evident to the uninitiated that no workman, however skilled, could cut the pattern without severing them. The nut on the face of it looks uncrackable; but on closer inspection it will be seen that some very fine parallel marks are made upon the blank margins of the stencil-plates corresponding to the threads inside the paper and running through the designs. Still, the art of stencil cutting must be an extremely delicate and difficult task. This is the *modus operandi*. The artist-workman takes some half-dozen sheets of tough paper made of mulberry fibre prepared with the juice of persimmon, and waterproofed with a hard-drying oil. On the top he places the design drawn with ink. The sheets firmly secured, he begins cutting with a long, thin knife, slowly cutting through the pile of paper, following the curves of the pattern, the holes and dots being punctured with a clean-cutting punch. Two of the sheets are then damped so that they may expand, and—what is of equal importance—contract equally in drying. One of these is laid down flat, and covered with adhesive material. The threads are then one by one put in position, the end sticking on to the margins. The joining of the two plates inclosing the threads is so absolutely perfect that a strong glass fails to disclose any sign of overlapping or unevenness. Mr. Tuer describes the further process of manufacture, and gives much information from various sources of the customs and costume of the Japanese. A population of one and forty millions takes some dressing. Commencing from the top left-hand corner of our sheet, No. 1 is the Hawthorn; No. 2, an alternative flower pattern; No. 3, Feathers; No. 4, Wild rose; No. 5, Tits or birds; No. 6, Fret pattern; No. 7, Running fanciful design, with birds and cages introduced; No. 8, Bamboo doubled round to form rings in the pattern; No. 9 (the first of the large patterns), is of bamboos conventionalised; No. 10, Splashed design; No. 12, Crayfish; No. 13, Carp and catarract; and No. 14, Hairy-tailed tortoise (hairy tail, special mark of longevity). Mr. Tuer has printed his introduction in French and German, as well as in English, and we need hardly say that the types and execution are all that could be desired from the machines of the Leadenhall Press, which in the past has determined no mean standard of excellence.

COLONIAL MEMBERSHIP OF THE SURVEYORS' INSTITUTION.

THE Council of the Surveyors' Institution have during the past twenty years received many applications from surveyors holding official positions in the British colonies and dependencies to be elected members of the Institution, but it is only recently that they have been in a position to entertain such applications for admission without examination under the provisions of a by-law which states that "it shall be in the power of the Council, by a vote of not less than three-fourths of the whole Council, to dispense with an examination in favour of any candidate of exceptional standing as a surveyor or of a candidate holding an official appointment as a surveyor in any of the British colonies or dependencies who shall have passed such other examination as the Council may accept in lieu of the said examination." Admission to every grade of members, except to the limited class of non-professional Associates, can now only be obtained by a searching examination, for which colonial surveyors could not be expected to present themselves. Under the above by-law the Council of the Institution are prepared to entertain applications for admission to membership without examination from surveyors holding official positions in India, the Australasian Colonies, Canada, British Guiana, the West Indies, Cape Colony, and the Straits Settlements, where it is understood that candidates for such appointments are required to pass an examination, which can be accepted in lieu of the professional examination of the Institution. Candidates will be eligible who have passed examinations qualifying them as authorised licensed surveyors, or as Crown surveyors, or Surveyors-General in any of the foregoing colonies and dependencies. While the diploma will bear on it a notification that it applies solely

to the colonies, the privileges of colonial members will be identical with those of all other members. We understand that the Colonial Office have considered this new departure in the Surveyors' Institution of sufficient importance to forward copies of the Council's memorandum explaining its provisions to every British colony throughout the world.

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Ditto	1	ditto 3-16	ditto	14 15 0
Ditto	1	ditto	ditto	22 5 0
42 by 28 by 26	1	ditto	ditto	30 10 0
Ditto	1	ditto 3-16	ditto	16 0 0
Ditto	1	ditto	ditto	24 5 0
48 by 30 by 28	1	ditto	ditto	34 0 0
Ditto	1	ditto 3-16	ditto	17 5 0
Ditto	1	ditto	ditto	28 15 0
Ditto	1	ditto	ditto	39 10 0

Any of the above can be fitted with a shelf at an extra of 24s.

54 by 32 by 30	1 ditto 3-16	ditto	ditto	21 0 0
Ditto	1 ditto 3-16	ditto	ditto	35 10 0
Extra for shelf	1 ditto 3-16	ditto	ditto	47 10 0

DOUBLE-DOOR SAFES—

24 by 24 by 18	door	body plates,	£ s. d.
		2 drawers	ditto 9 10 0
Ditto	1 ditto 3-16	ditto	ditto 16 15 0
27 by 27 by 19	1 ditto 3-16	ditto	ditto 20 10 0
Ditto	1 ditto 3-16	ditto	ditto 10 10 0
30 by 30 by 20	1 ditto 3-16	ditto	ditto 18 13 0
Ditto	1 ditto 3-16	ditto	ditto 23 2 0
30 by 30 by 20	1 ditto 3-16	ditto	ditto 12 5 0
Ditto	1 ditto 3-16	ditto	ditto 20 18 0
30 by 30 by 22	1 ditto 3-16	ditto	ditto 26 18 0
Ditto	1 ditto 3-16	ditto	ditto 12 18 0
35 by 35 by 24	1 ditto 3-16	ditto	ditto 21 0 0
Ditto	1 ditto 3-16	ditto	ditto 27 0 0
35 by 35 by 24	1 ditto 3-16	ditto	ditto 16 8 0
Ditto	1 ditto 3-16	ditto	ditto 24 10 0
36 by 36 by 25	1 ditto 3-16	ditto	ditto 30 10 0
Ditto	1 ditto 3-16	ditto	ditto 20 4 0
42 by 42 by 25	1 ditto 3-16	ditto	ditto 30 0 0
Ditto	1 ditto 3-16	ditto	ditto 35 10 0
42 by 42 by 25	1 ditto 3-16	ditto	ditto 24 5 0
Ditto	1 ditto 3-16	ditto	ditto 32 10 0
48 by 48 by 28	1 ditto 3-16	ditto	ditto 43 0 0

Any of the above can be fitted with a shelf at an extra of 20s.

48 by 48 by 28	1 ditto 3-16	ditto	ditto	26 18 0
Ditto	1 ditto 3-16	ditto	ditto	40 0 0
Extra for shelf	1 ditto 3-16	ditto	ditto	51 0 0
54 by 54 by 30	1 ditto 3-16	ditto	ditto	1 7 8
Ditto	1 ditto 3-16	ditto	ditto	29 8 0
Extra for shelf	1 ditto 3-16	ditto	ditto	46 10 0
60 by 60 by 32	1 ditto 3-16	ditto	ditto	62 0 0
Extra for shelf	1 ditto 3-16	ditto	ditto	1 10 0

FIREPROOF DEED CHESTS—

12 by 9 by 7 deep	ditto	£ s. d.
14 by 10 by 8 ditto	ditto	3 8 0
16 by 11 by 9 ditto	ditto	4 0 0
18 by 12 by 10 ditto	ditto	4 12 0

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18 by 12 by 10 deep	each	£ s. d.
20 by 14 by 12 ditto	ditto	4 18 0
22 by 16 by 14 ditto	ditto	5 10 0
24 by 18 by 16 ditto	ditto	6 6 0
26 by 20 by 18 ditto	ditto	7 5 0
28 by 22 by 20 ditto	ditto	8 0 0
30 by 24 by 22 ditto	ditto	8 18 0
32 by 26 by 24 ditto	ditto	9 15 0

STRONG WROUGHT-IRON PLATE CHEST—

14 by 9 by 8 deep	ditto	£ s. d.
16 by 11 by 10 ditto	ditto	3 10 0
18 by 12 by 11 ditto	ditto	4 14 0
20 by 14 by 12 ditto	ditto	5 5 0
22 by 15 by 13 ditto	ditto	5 16 0
24 by 17 by 14 ditto	ditto	6 10 0
26 by 18 by 15 ditto	ditto	7 0 0
28 by 20 by 16 ditto	ditto	7 10 0
30 by 21 by 17 ditto	ditto	8 15 0
32 by 22 by 18 ditto	ditto	9 15 0
34 by 23 by 19 ditto	ditto	11 0 0
36 by 24 by 20 ditto	ditto	12 0 0

JAPANESE DEED BOXES, with safeguard,

patent lock, 2 keys—	ditto	£ s. d.
No. 1 12 by 8 by 9 deep	ditto	0 12 0
2 14 by 10 by 10 ditto	ditto	0 16 0
3 16 by 12 by 11 ditto	ditto	0 18 6
4 18 by 14 by 12 ditto	ditto	1 1 0
5 20 by 16 by 13 ditto	ditto	1 5 6
6 22 by 18 by 14 ditto	ditto	1 9 0
7 24 by 20 by 15 ditto	ditto	1 13 6

THIEFPROOF SAFES, not fireproof—

18 by 12 by 12 deep, single door	ditto	£ s. d.
20 by 14 by 13 ditto	ditto	4 14 0
22 by 15 by 14 ditto	ditto	4 19 0
24 by 16 by 15 ditto	ditto	5 5 0
26 by 17 by 16 ditto	ditto	5 9 0
28 by 18 by 17 ditto	ditto	5 14 0
30 by 19 by 18 ditto	ditto	5 17 0
32 by 20 by 19 ditto	ditto	6 0 0
34 by 21 by 20 ditto	ditto	6 4 0
36 by 22 by 21 ditto	ditto	6 7 0
38 by 23 by 22 ditto	ditto	6 12 0
40 by 24 by 23 ditto	ditto	8 10 0
42 by 25 by 24 ditto	ditto	12 10 0
44 by 26 by 25 ditto	ditto	9 3 0
46 by 27 by 26 ditto	ditto	9 9 0
48 by 28 by 27 ditto	ditto	13 10 0
50 by 29 by 28 ditto	ditto	24 10 0

POST-OFFICE RECEIVING HOUSE LETTER

BOX DOORS AND FRAMES—	ditto	£ s. d.
20 by 24 with 1 door	ditto	3 9 0
Ditto ditto 2 ditto	ditto	4 3 6
Ditto ditto 3 ditto	ditto	5 8 0
22 by 24 ditto 1 ditto	ditto	3 10 0
Ditto ditto 2 ditto	ditto	4 7 0
Ditto ditto 3 ditto	ditto	5 12 6
24 by 30 ditto 1 ditto	ditto	4 0 0
Ditto ditto 2 ditto	ditto	5 0 0
Ditto ditto 3 ditto	ditto	6 6 0
24 by 36 ditto 1 ditto	ditto	4 10 0
Ditto ditto 2 ditto	ditto	5 10 0
Ditto ditto 3 ditto	ditto	7 0 0
24 by 42 ditto 1 ditto	ditto	5 2 8
Ditto ditto 2 ditto	ditto	6 3 0
Ditto ditto 3 ditto	ditto	7 17 0
24 by 50 ditto 1 ditto	ditto	5 17 6
Ditto ditto 2 ditto	ditto	7 0 0
Ditto ditto 3 ditto	ditto	8 12 0
24 by 56 ditto 1 ditto	ditto	6 2 6
Ditto ditto 2 ditto	ditto	7 8 0
Ditto ditto 3 ditto	ditto	9 0 0
24 by 56 ditto 1 ditto	ditto	6 10 0
Ditto ditto 2 ditto	ditto	7 13 0
Ditto ditto 3 ditto	ditto	9 3 0

STRONG WROUGHT-IRON DOORS AND

FRAMES—	ditto	£ s. d.
5ft. 9in. by 2ft. 3in. 3in. by 3in. frames	ditto	12 12 0
Ditto ditto 3 1/2 by 1 1/2 ditto ditto	ditto	15 15 0
Ditto ditto 4 1/2 by 1 1/2 ditto ditto	ditto	21 5 0
6ft. 0in. by 2ft. 6in. 3 by 3 by ditto ditto ditto	ditto	14 14 0
Ditto ditto 3 1/2 by 1 1/2 ditto ditto ditto	ditto	17 17 0
Ditto ditto 4 1/2 by 1 1/2 ditto ditto ditto	ditto	23 10 0
6ft. 3in. by 2ft. 6in. 3 by 3 by ditto ditto ditto	ditto	17 0 0
Ditto ditto 3 1/2 by 1 1/2 ditto ditto ditto	ditto	20 10 0
Ditto ditto 4 1/2 by 1 1/2 ditto ditto ditto	ditto	26 0 0
6ft. 6in. by 2ft. 9in. 3 by 3 by ditto ditto ditto	ditto	19 0 0
Ditto ditto 3 1/2 by 1 1/2 ditto ditto ditto	ditto	23 10 0
Ditto ditto 4 1/2 by 1 1/2 ditto ditto ditto	ditto	29 0 0

The above can be made fireproof at a

cost of £4 each.

Extra and differing locks can be fitted at an extra cost of 30s. per lock.

LIFTS AND HOISTS: Messrs. Waygood and Co.'s—

HANDPOWER LIFTS—	each	£ s. d.
Cage 2ft. 0in. by 2ft. 0in. by 3ft. 0in. complete with safety apparatus worked by endless rope and balance weight, to raise 3cwt. 20ft. high.	each	23 0 0
Any additional length over 20ft. at 3s. 6d. per foot.		
Fixing, &c., per foot.	ditto	25 10 0
To raise 5cwt.	ditto	29 0 0
Ditto 10cwt.	ditto	29 0 0
Cage 2ft. 6in. by 2ft. 6in. by 3ft. 0in. to raise 3cwt.	ditto	25 10 0
Ditto ditto ditto to raise 5cwt.	ditto	28 0 0
Ditto ditto ditto to raise 10cwt.	ditto	31 0 0
Ditto 3ft. 0in. by 2ft. 6in. by 3ft. 6in. to raise 3cwt.	ditto	28 10 0
Ditto ditto ditto to raise 5cwt.	ditto	29 10 0
Ditto ditto ditto to raise 10cwt.	ditto	33 0 0
Ditto 3ft. 6in. by 3ft. 0in. by 4ft. 0in. to raise 3cwt.	ditto	31 10 0
Ditto ditto ditto to raise 5cwt.	ditto	33 0 0
Ditto ditto ditto to raise 10cwt.	ditto	37 0 0
Ditto 4ft. 0in. by 3ft. 0in. by 5ft. 0in. to raise 3cwt.	ditto	35 0 0
Ditto ditto ditto to raise 5cwt.	ditto	37 0 0
Ditto ditto ditto to raise 10cwt.	ditto	40 10 0

These prices do not include preparing and trimming well holes or inclosing, and the price for fixing is for fixing in ordinary positions only.

ORDINARY		HAND-POWER		WAREHOUSE	
LIFTS—					
Cage	2ft. 6in.	by 2ft. 6in.	for 2cwt.	£	s. d.
			left complete	19	10 0
			gear only	6	10 0
Ditto	2ft. 6in.	by 2ft. 3in.	left complete	22	8 0
			gear only	8	0 0
Ditto	3ft. 6in.	by 2ft. 6in.	left complete	23	10 0
			gear only	9	10 0
Ditto	3ft. 6in.	by 3ft. 6in.	left complete	26	0 0
			gear only	11	0 0
Ditto	4ft. 6in.	by 3ft. 6in.	left complete	28	0 0
			gear only	13	0 0
Ditto	2ft. 6in.	by 2ft. 6in.	to raise 5cwt.		
			left complete	21	10 0
			gear only	8	10 0
Ditto	2ft. 6in.	by 2ft. 3in.	left complete	23	0 0
			gear only	10	0 0
Ditto	3ft. 6in.	by 2ft. 6in.	left complete	24	10 0
			gear only	11	10 0
Ditto	3ft. 6in.	by 3ft. 6in.	left complete	27	0 0
			gear only	13	0 0
Ditto	4ft. 6in.	by 3ft. 6in.	left complete	30	0 0
			gear only	15	0 0
Ditto	2ft. 6in.	by 2ft. 6in.	to raise 7cwt.		
			left complete	22	10 0
			gear only	10	10 0
Ditto	2ft. 6in.	by 2ft. 3in.	left complete	25	0 0
			gear only	12	0 0
Ditto	3ft. 6in.	by 2ft. 6in.	left complete	26	0 0
			gear only	13	10 0
Ditto	3ft. 6in.	by 3ft. 6in.	left complete	28	10 0
			gear only	15	0 0
Ditto	4ft. 6in.	by 3ft. 6in.	left complete	31	10 0
			gear only	17	0 0
Ditto	2ft. 6in.	by 2ft. 6in.	to raise 10cwt.		
			left complete	23	10 0
			gear only	12	10 0
Ditto	2ft. 6in.	by 2ft. 3in.	left complete	25	10 0
			gear only	14	0 0
Ditto	3ft. 6in.	by 2ft. 6in.	left complete	27	0 0
			gear only	15	10 0
Ditto	3ft. 6in.	by 3ft. 6in.	left complete	30	0 0
			gear only	17	0 0
Ditto	4ft. 6in.	by 3ft. 6in.	left complete	33	10 0
			gear only	19	0 0
Extra height, 3s. 6d. to 4s. per foot.					
Fixing, about 20 per cent. extra.					
INVALID OR PASSENGER LIFTS, worked by an endless rope; height, 20ft. over all—					
Cage	2ft. 6in.	by 3ft. 6in.	by 6ft. 6in.	£	s. d.
			high, to raise 2cwt., fixed complete	45	0 0
Ditto	3ft. 6in.	by 3ft. 6in.	by 6ft. 6in.		
			to raise 3cwt. ditto	48	0 0
Ditto	3ft. 6in.	by 3ft. 6in.	by 6ft. 6in.		
			to raise 5cwt. ditto	51	0 0
Extra per foot in height				ditto	0 3 6
ditto				ditto	0 6 0
SINGLE LIFTS, for trade purposes—					
Cage or Box	1ft. 9in.	by 1ft. 6in.	by 2ft. 6in., to raise 1cwt., fixed complete	ditto	23 10 0
ditto	2ft. 6in.	by 1ft. 9in.	by 2ft. 6in. ditto ditto	ditto	25 0 0
ditto	2ft. 3in.	by 2ft. 6in.	by 3ft. 6in., to raise 1½cwt. ditto	ditto	27 10 0
ditto	2ft. 6in.	by 2ft. 6in.	by 3ft. 6in., to raise 1½cwt. ditto	ditto	31 10 0
COAL AND LUGGAGE LIFTS—					
Box	2ft. 6in.	by 1ft. 6in.	to raise 2cwt., fixed complete	ditto	30 0 0
Ditto	3ft. 6in.	by 2ft. 6in.	by 4ft. 6in. high, to raise 3cwt. ditto	ditto	32 10 0
Ditto	4ft. 6in.	by 3ft. 6in.	by 5ft. 6in. high, to raise 4cwt. ditto	ditto	36 10 0
SINGLE DINNER LIFTS, 20ft. high—					
Box	1ft. 6in.	by 1ft. 6in.	in clear by 1ft. 9in. high, to carry 56lb., fixed complete	ditto	17 10 0
Ditto	1ft. 9in.	by 1ft. 6in.	by 2ft. 6in. to carry 56lb. ditto	ditto	18 5 0
Ditto	2ft. 6in.	by 1ft. 6in.	by 2ft. 6in. to carry 84lb. ditto	ditto	19 10 0
Ditto	2ft. 3in.	by 2ft. 6in.	by 2ft. 6in. to carry 84lb. ditto	ditto	20 10 0
Ditto	2ft. 6in.	by 2ft. 6in.	by 2ft. 6in. to carry 84lb. ditto	ditto	21 15 0
Additional height 3s. per foot, and if including fixing, 6s. per foot.					
The prices are exclusive of shutters and inclosures.					
LIGHT SINGLE LIFTS, fixed complete—					
1ft. 6in.	by 1ft. 6in.	by 1ft. 6in.	to carry 20lb. ditto	13	10 0
1ft. 3in.	by 1ft. 3in.	by 1ft. 6in.	to carry 28lb. ditto	14	5 0
1ft. 6in.	by 1ft. 3in.	by 2ft. 6in.	to carry 30lb. ditto	15	0 0
1ft. 9in.	by 1ft. 6in.	by 2ft. 6in.	to carry 30lb. ditto	16	5 0
A speaking tube can be fixed to these at 1s. 3d. per foot run, fixed complete.					
IMPROVED LIFT GEAR—					
No. 1, suitable for boxes	1ft. 6in.	by 1ft. 6in.	to 1ft. 9in. by 1ft. 6in. unfixed	ditto	5 0 0
(These do not include ropes or balance weights.)					
No. 2, ditto for boxes	1ft. 9in.	by 2ft. 3in.	to 2ft. 9in. by 2ft. 6in. unfixed	ditto	6 0 0
DINNER LIFTS, fixed—					
Box	1ft. 6in.	by 1ft. 6in.	and 1ft. 9in. high, 15ft.; total height 15ft., to raise 56lb. and exclusive of side-board or inclosure	ditto	13 10 0
			Ditto better quality	ditto	19 0 0
Ditto	1ft. 9in.	by 1ft. 6in.	by 2ft. 6in.	ditto	16 10 0
			Ditto better quality	ditto	22 0 0
Ditto	2ft. 6in.	by 1ft. 6in.	by 2ft. 6in. to raise 84lb.	ditto	20 10 0
			Ditto better quality	ditto	25 0 0
(The above lifts are worked by handle.)					

DOUBLE DINNER LIFTS, fixed—			
Box	1ft. 6in. by 1ft. 6in. by 1ft. 6in. in clear height 20ft., to raise 31b. each	£ s. d.	14 0 0
Ditto	1ft. 6in. by 1ft. 6in. by 1ft. 6in. to raise 56lb. ditto		16 0 0
Ditto	1ft. 6in. by 1ft. 6in. by 1ft. 6in. to raise 30lb. ditto		15 0 0
Ditto	1ft. 6in. by 1ft. 6in. by 1ft. 6in. to raise 30lb. ditto		17 10 0
Ditto	1ft. 6in. by 1ft. 6in. by 1ft. 6in. to raise 30lb. ditto		16 10 0
Ditto	1ft. 6in. by 1ft. 6in. by 1ft. 6in. to raise 30lb. ditto		20 10 0
Ditto	1ft. 6in. by 1ft. 6in. by 1ft. 6in. to raise 30lb. ditto		18 0 0
Ditto	1ft. 6in. by 1ft. 6in. by 1ft. 6in. to raise 30lb. ditto		24 0 0
Ditto	1ft. 6in. by 1ft. 6in. by 1ft. 6in. to raise 30lb. ditto		20 0 0
Ditto	1ft. 6in. by 1ft. 6in. by 1ft. 6in. to raise 30lb. ditto		23 10 0
Ditto	1ft. 6in. by 1ft. 6in. by 1ft. 6in. to raise 30lb. ditto		31 10 0
Extra length over 20ft. add 5s. per foot fixed for the 56lb., and 4s. fixed on the 30lb.			
CELLAR HOISTS, fixed, exclusive of any excavating—			
Table	2ft. 6in. by 2ft. 6in., steps 1ft. 6in., height of basement 10ft., weight 2 to 5cwt.	ditto	25 10 0
Ditto	3ft. 6in. by 2ft. 6in., and 1ft. 6in. steps, to raise 5 to 10cwt.	ditto	32 10 0
Ditto	3ft. 6in. by 3ft. 6in., steps 2ft., load 15 to 20cwt.	ditto	37 10 0
CELLAR HOISTS, fixed, but exclusive of any excavating—			
Platform	2ft. 6in. by 2ft. 6in., height of basement 10ft., load 2 to 5cwt.	ditto	31 10 0
Ditto	3ft. 6in. by 2ft. 6in., load 5 to 10cwt.	ditto	37 10 0
Ditto	5ft. 6in. by 3ft. 6in., load 10 to 15cwt.	ditto	48 10 0
HOSPITAL AND INFIRMARY LIFTS, fixed—			
Cage	6ft. 6in. by 3ft. 6in. by 6ft. 6in. inside, 80ft. high, to carry 5cwt.	ditto	70 0 0
Ditto	7ft. 6in. by 4ft. 6in. by 6ft. 6in. inside, 40ft. high, to carry 5cwt.	ditto	80 0 0
Ditto	7ft. 6in. by 5ft. 6in. by 6ft. 6in. inside, 45ft. high, to carry 7cwt.	ditto	99 0 0
FURNITURE LIFTS, fixed—			
Cage	4ft. 6in. by 3ft. 6in. by 5ft. 6in., to raise 5cwt., height 20ft.	ditto	42 10 0
Ditto	5ft. 6in. by 3ft. 6in. by 7ft. 6in., to raise 5cwt., height 20ft.	ditto	47 10 0
	Safety apparatus extra	ditto	5 0 0
Ditto	5ft. 6in. by 4ft. 6in. by 7ft. 6in., to raise 5cwt., height 20ft.	ditto	51 0 0
	Safety apparatus extra	ditto	5 5 0
Ditto	6ft. 6in. by 4in. 6in. by 7ft. 6in., to raise 7cwt., height 30ft.	ditto	53 10 0
Ditto	6ft. 6in. by 4ft. 6in. by 7ft. 6in., to raise 7cwt., height 30ft.	ditto	56 10 0
	Safety apparatus extra	ditto	5 10 0
Ditto	7ft. 6in. by 4ft. 6in. by 7in. 6in., to raise 8cwt., height 40ft.	ditto	62 10 0
	Safety apparatus extra	ditto	5 10 0
Ditto	7ft. 6in. by 5ft. 6in. by 7ft. 6in., to raise 10cwt., height 40ft.	ditto	67 10 0
	Safety apparatus extra	ditto	6 0 0
WAREHOUSE OR FACTORY LIFTS, driven by belt with gearing on top floor, fixed—			
Cage	3ft. 6in. by 2ft. 6in. by 6ft. 6in., load 5cwt., to travel 20ft.	ditto	75 0 0
	Safety apparatus extra	ditto	5 0 0
Ditto	3ft. 6in. by 3ft. 6in. by 8ft. 6in., load 10cwt.	ditto	85 0 0
	Safety apparatus extra	ditto	5 0 0
Ditto	4ft. 6in. by 4ft. 6in. by 8ft. 6in., load 15cwt., to travel 30ft.	ditto	100 0 0
	Safety apparatus extra	ditto	7 10 0
Ditto	4ft. 6in. by 5ft. 6in. by 8ft. 6in., load 20cwt.	ditto	121 0 0
	Safety apparatus extra	ditto	10 0 0
HYDRAULIC AND CONTINUOUS LIFTS, for passengers, will require special estimates, as the space, position, height, &c., varies so much.			
WAREHOUSE HOISTS, unfixed—			
To lift 9cwt. (to hang under ceilings) ...	ditto	10 10 0	
Ditto 5cwt. ditto ditto	ditto	11 10 0	
Ditto 8cwt. ditto ditto	ditto	13 10 0	
Ditto 10cwt. ditto ditto	ditto	16 10 0	
CRANE HOISTS, unfixed—			
To lift 2cwt., size of barrel 18 by 6	ditto	12 0 0	
Ditto 5cwt. ditto 24 by 6	ditto	15 0 0	
Ditto 10cwt. ditto 30 by 8	ditto	25 0 0	
Chain per foot, 7d., 10d., and 1s. 1d.			
Rope per foot, 4d.			
To lift 2cwt. (double) barrel 18 by 6	ditto	21 0 0	
Ditto 5cwt. ditto 24 by 6	ditto	24 0 0	
Ditto 10cwt. ditto 30 by 8	ditto	35 0 0	
POWER HOISTS, unfixed—			
To lift 5cwt., barrel 18 by 7½	ditto	17 10 0	
Ditto 8cwt. ditto 24 by 7½	ditto	20 0 0	
Ditto 10cwt. ditto 30 by 7½	ditto	22 10 0	
Ditto 10cwt. ditto 30 by 7½ strong	ditto	30 0 0	
Ditto 20cwt. ditto 30 by 9	ditto	40 0 0	
Ditto 30cwt. ditto 30 by 9	ditto	50 0 0	
Ditto 40cwt. ditto 30 by 12	ditto	61 0 0	
ENCLOSURES for lifts—			
Match-board and 2 dwarf doors to 1ft. floor	ditto	7 10 0	
Ditto one door	ditto	5 0 0	
Enclosure of posts and 1 sliding balanced shutter of galvanised wire in deal framing			
	ditto	4 0 0	
Posts and rails only, with lifting-bar	ditto	1 5 0	

THE SOCIETY OF ENGINEERS.

At a meeting of this Society, held on Monday week, Mr. Joseph William Wilson, junr., president, in the chair, a paper was read by Mr. A. G. Drury on "The Shortlands

and Nunhead Railway." The railway, which is a double line, commences by a junction with the Chatham Company's main line at Shortlands, passes through open country for the first half of its length, then runs through the suburbs of Catford and Brockley, and terminates by a junction at Nunhead station, having crossed a branch of the S.E. Railway, as well as the L.B. and S.C. Railway's main line, on the route. The length is 4½ miles. Attention was drawn to the fact that the line having been laid out to suit the views of the landowners, has not been laid out perhaps in the best way from an engineering point of view, also that as some of the estates passed through are about to be developed as building properties, the accommodation bridges are both frequent, and of a width or span suitable to future requirements. The elevations too, are of a more or less ornamental character, all of which requirements have added considerably to the cost of the undertaking. The number of bridges in the length is twenty-five, in addition to two short viaducts. Six of these bridges are for public-road crossings, two are over other railways, two are over streams, and fifteen are accommodation bridges. Brickwork and concrete has been used in the construction of the abutments and wing walls, the brickwork being in lias lime mortar except in the case of arches or in damp situations when cement mortar was used. The road bridges over the railway are chiefly of two types. One consists of a floor of plate girders resting on brick abutments, and spaced from 6ft. to 7ft. apart. Between the girders are jack arches which spring from their lower flanges; the top is levelled up with concrete and asphalted, the road metalling being laid above this. When the headway was very restricted another type of floor was adopted, which consisted of shallow troughs of a rectangular section, built with plates and 2in. bars, and placed parallel with the roadway. In this case the span was divided by columns placed between the lines of rails. The road bridges under the railway consist of plate girders resting on brick abutments, with a floor of built-up troughs. The bridges over the two railways crossed, of 163ft. 6in. and 110ft. spans respectively, consist of N-truss girders resting on brick abutments. At Catford two short brick viaducts, one 620ft. long, the other 200ft. long, carry the line through building property. The stations are five in number. The booking offices are all built of red bricks, with tiled roofs, and stand on the level of the adjacent roadways, being connected with the platform by covered stairs and galleries. The works have been carried out under the direction of Mr. John Wolfe Barry, M.I.C.E., the author acting as resident engineer in charge. The contractors were Messrs. Lucas and Aird, who were represented on the ground by Mr. John Blue, and latterly by Mr. Charles F. Day.

The thirty-eighth annual meeting of this society was held on Monday. The chair was occupied by Mr. Joseph William Wilson, junr., president. The following gentlemen were elected by ballot as the council and officers for 1893—viz., as president, Mr. William Andrew McIntosh Valon; as vice-presidents, Messrs. George Abraham Goodwin, Henry Faija, and William George Peire; as ordinary members of council, Messrs. R. W. Peregrine Birch, Chas. Claude Carpenter, Samuel Herbert Cox, Charles Gandon, Thomas Bell Lightfoot, Perry Fairfax Nursey, William Bradford, and George Maxwell Lawford; as hon. secretary and treasurer, Mr. Alfred Williams; as joint honorary auditors, Messrs. Alfred Lass, F.C.A., and Samuel Wood, F.C.A.

The annual dinner of the above society took place at the Holborn Restaurant on Wednesday. The President, Mr. Joseph William Wilson, junr., occupied the chair; and those present included Mr. W. A. McIntosh Valon (President-elect), Mr. Henry Adams, Mr. Jabez Church, Mr. Charles Gandon, and Professor Robinson (past Presidents); Mr. G. A. Goodwin (Vice-President), Mr. S. H. Cox, Mr. Henry Faija, Mr. G. M. Lawford, and Mr. W. G. Peire (members of Council); Mr. Alfred Williams (hon. sec. and treasurer), and Mr. G. A. Pryce Cuxson (secretary); Mr. Worby Beaumont, Colonel Harding, Mr. G. T. Rait, and Mr. J. W. Wilson. The chief toast of the evening, "The Society of Engineers," was proposed by Mr. Henry Faija, coupled with it being the names of the President, the Hon. Secretary and Treasurer, and the Secretary. In replying to the toast, the President enlarged upon the rapid pro-

gress of the Society, both financially and numerically. At the last annual dinner the year's increase in membership had been stated at 8 per. cent., and the increase for 1892 had been equally good. The membership was the highest yet attained in the 38 years' history of the society. This satisfactory state of affairs was due to several causes: the papers read at their ordinary meetings were carefully selected; the meetings had been very well attended; and the discussions had been increasingly practical and valuable. The professional visits had been this year popular and well-supported. They included the Tower Bridge, the South Metropolitan Gasworks at East Greenwich, the Kingston Sewerage Works, the South-west and Vauxhall Waterworks at Hampton, Messrs. Willans and Robinson's Works, Thames Ditton, and the Great Eastern Railway Locomotive Works at Stratford. The progress of the society was largely due to the unremitting labours of the council generally, and in an especial degree to their hon. secretary and treasurer, Mr. Alfred Williams, and to the business capabilities, tact, and energy of their secretary, Mr. Pryce Cuxson. The secretary also responded.

BOOKS RECEIVED.

By far the best and cheapest official catalogue of a public art collection we have yet seen is that prepared by Mr. Whitworth Wallis, F.S.A., the energetic keeper of the Birmingham Museum and Art Gallery, descriptive of the collections under his charge. In a sixpenny handbook Mr. Wallis gives readable notices of all the artists whose works are on view, arranged for facility of reference in alphabetical order, and these are interspersed by no fewer than 46 full-page illustrations of the permanent collection of paintings and statuary in the Art Gallery, and of the pictures at Aston Hall. The collections include representative landscapes by David Cox, and other works by Rossetti, Holman Hunt, Burne Jones, and Madox Brown, as well as examples of the older British masters, such as Bonington and Morland, and pictures by Leighton, Watts, and Millais. Sight measurements of the pictures add to the value of the handbook. We have also received the *Illustrated Catalogue to the Glasgow Art Galleries*, compiled by Mr. James Paton, superintendent of the Galleries and of Kelvingrove Museums, which is illustrated with a score full-page colotype reproductions of the more important and representative works of the old masters under their charge. The Glasgow Galleries of Art owe their origin, we are told, to a local coachbuilder and magistrate, Archibald M'Lellan, who acquired a collection of Continental pictures which became the nucleus, and is still the most considerable portion of the contents of the gallery. To these pictures, acquired by the corporation in 1856, have been added by bequests the collections formed by William Ewing and J. Graham Gilbert, R.S.A. These three bequests include 460 pictures, and the list has since been swelled by donations and legacies by about a hundred works of art, the present catalogue enumerating 561 pictures, besides 99 busts and other examples of sculpture. Mr. Paton gives brief biographical accounts of artists in an alphabetical list, and descriptions of the works. The good examples thus set by Mr. Wallis at Birmingham and Mr. Paton at Glasgow should be followed by the National Gallery and South Kensington authorities. We have not seen a guide-book of any kind, illustrated or otherwise, to the Diploma Gallery at Burlington House, while that to the Soane Museum needs revision, and the cuts might be improved and modern process-blocks introduced—a hint to the new curator. —*Poems in Petroleum* are the collected works of J. CAMERON GRANT, and will add to his rising reputation. His chief power is as a word painter, and some of his descriptions of South American life and scenery have much picturesque and vigour; the fault is a too frequent imitation of Tennyson's mannerisms and favourite metres. The new customary tribute to the late poet laureate, with which, as a matter of course, the volume closes, is beyond the average of these effusions. —*Quantity Surveyors' Tables and Diary for 1893* (London: Metchim and Son) is as handy a pocket calendar and remembrancer as any issued. The price is only sixpence. —*Practical Electric-Light Fitting*, by F. C. ALLSOP, author of *Telephone Construction*, &c. (London: Whittaker and Co.), follows the lines of the author's works on Electric Bell Fitting and

Telephones. As the author is a manufacturing electrician, the book is thoroughly practical, and is an amplification of a series of articles published in the *English Mechanic*. The author deals with the subject of supplying electricity from central stations to houses. Like a gas company, the electric-light company supply the electric current, the consumer making the connection to his building, which is done for him by an electric-light engineer. The laying on and fitting up is very important, and, as Mr. Allsop points out, unless the wiring is done by an experienced electrician disastrous effects follow. The directions given for wiring and fitting up houses and the laying of private installations, the remarks on main switches, switch boards, and branch switches are useful, and the points to be attended to are clearly stated. The want of ample contact surface, for example, is likely to lead to over-heating of switch, and other troubles. Several forms for obviating this weakness, often caused by wear of the switch, are to be found, as in those which automatically compensate for wear; several kinds of switches are illustrated. The details of fuse-boards, ceiling roses, wall-plugs, are considered, and various patterns given. Incandescent lamps and holders, arc lamps, pendants, brackets, are severally described and illustrated by carefully engraved examples. The modes of wiring floors and walls, moulded casings for wires, damp walls, ceiling casings, and other details receive particular attention, and the chapters discussing them ought to be read by every architect and engineer. The concluding chapters discuss circuit arrangements, testing, fitting, fire office rules, private installations, &c. The author's book gives information about, and supplies just those details of electric-light fitting which architects ought to have before they write their specifications. —*The Carpenter and Joiner*, by various authorities, edited by Robert Scott Burn, with folding plates and illustrations (London: Ward, Lock, Bowden, and Co.) is another volume of the technical series which these enterprising publishers are bringing out. The contents of this volume originally appeared in the "Technical Journal and Industrial Self-Instructor," but the compilers have added thereto a section on timber which will be found to deal pretty fully with the subject. The paragraph or sectional form of arrangement has been adopted instead of chapters, and the work is copiously illustrated by woodcuts and 207 folding plates, showing every kind of simple timber construction and joinery. As an elementary introduction to the subject of carpenter and joiners' work we can recommend the work to the workman and student. The sections on roofing joints and framing and strengthening of beams give a very complete description of the joints used, and are well illustrated. —*The Principles of Pattern-making*, by a Foreman Pattern-maker (London: Whittaker and Co.), has been written specially for apprentices and students in technical schools, and for this purpose the book is well suited. The types or examples selected are those generally required in the shops. Thus bracket-making, methods of jointing to enable the patterns to deliver from their moulds; modes of casting wheels, chimney bases, steam-chests, boxing up, swept work, engine cylinder, gear wheels, and other examples of pattern-making for the engineer's shop are explained and illustrated on the simplest principles. The chapter on "Constructional Joints" will be found of service to architects as well as engineering students. The tools and materials used are described, and there is a good glossary of technical terms at the end. —*The Engineering Magazine*, New York, for November, contains several interesting articles, one on "Light in Tall Office Buildings," by Mr. Dankmar Adler, illustrated; "City Hall Architecture," by Mr. Barr Ferre, illustrated; in addition to several engineering subjects of industrial interest. The present number is certainly much above the average of American engineering journals. —*The "Driquo" Blotting Case* (London: Spicer Bros., Limited) is an elegant and useful desk accompaniment, filled with an entirely new production in blotting paper, which well merits its name, for it is the most absorbent we have ever tried. It is also the most economical, for it blots equally well when covered with ink as when new. The new "Driquo" blotting paper is kept in white and pink colours, and in extra thick substance. We strongly recommend all readers to try a few quires. We much doubt if they will ever use any other afterwards.

WEIGHT OF CROWDS.

VERY contradictory statements of weights on floors are to be found in tables and text-books, in some cases the disparity showing a ratio of 4 to 1. It seems extraordinary that so great a diversity of weights should be possible. The engineer and architect are often perplexed by finding no satisfactory evidence to guide them. An instance of this diversity was given by Professor Kernot in a paper lately read before the Victorian Institute of Engineers. The author gives, in tabular form, a few examples of the weight of crowds, and the names of authorities making them. Thus one estimate quoted as French practice, by Stoney and Trautwine, gives 41lb. per square foot as the weight of a crowd. Hatfield, in "Transverse Strains," gives 70lb.; Mr. Page, engineer to Chelsea bridge, 84lb.; Mr. Nash, architect of Buckingham Palace, quoted by Tredgold, 120lb.; Mr. W. N. Kernot, at Working Men's College, Melbourne, puts the weight at 126lb.; Professor W. C. Kernot, at Melbourne University, gives it as 143.1; and Mr. B. B. Stoney, in his work on Stresses, as 147.4lb. per square foot. These statements vary to a degree which is quite perplexing. Professor Kernot criticises these statements, and shows that the space occupied by soldiers as taken by Hatfield in his investigation is not that of a crowd. The soldiers are arranged in lines at a distance apart to allow room for knapsacks, weapons, and other accoutrements; but a crowd is a body of men forced together by pressure into close contact. An average man in a crowd, Professor Kernot says, occupies a space little, if any, exceeding one square foot. Other results are also taken to task as being below the truth. Tredgold's 120lb. is considered the first on the list worthy of consideration. The last stated weight is considered the most conclusive. Mr. Stoney's experiments were conducted with precision, and resulted in a little more than one man per square foot, giving a weight of 147.4lb. per square foot. Prof. Kernot concludes, a dense crowd of well-grown men is proved, by his own and Mr. Stoney's experiments, to weigh from 140lb. to 150lb. per square foot.

"HARD SILVER" PLATING.

THE "Arcas" process of plating with an alloy of silver and cadmium is especially adapted for the fittings of halls, churches, &c., as it does not tarnish so readily as either pure silver or electro-plate, and is easily cleaned by merely wiping over with a damp cloth, and rubbing slightly with a dry leather, none of the polishing powders being required. Its first cost is less than nickel or silver plating, and as it lasts much longer it is consequently cheaper to the extent of about 30 per cent. during its life, though only about 10 per cent. at first. It is harder than ordinary plating, but not so hard as nickel; it is, however, more durable, and holds with great tenacity to iron and pewter, as well as to the ordinary metals. In places where much gas is used, or the ornamental metal work is exposed, it is a great advantage for the "Arcas" metal that it is so easily cleaned and polished, while its colour is equal to that of pure silver. The works of the company are at 80-81, Turnmill-street, near Farringdon-road Station, and specimens there shown will give an idea of the great variety of work for which the process is suitable. It is the best plating for lavatory fittings, for all work exposed to the atmosphere, and is extensively used for electric-light fittings, bells, &c.

CHIPS.

An advertisement in the daily press announces that Mr. Fothergill Watson, of Mapperley-road, Nottingham, architect, has assumed and adopted the name of Watson Fothergill.

A brass tablet, placed on a slab of black marble, has been erected in the chancel of Bishopthorpe Church, York, as a memorial of the late Archbishop Thomson. The inscription is surrounded by a border, and surmounted by a shield, combining the arms of the late Dr. Thomson and those of the see of York.

The Royal English Opera House, built from Mr. T. E. Colcutt's designs two years since, was reopened as the Palace Theatre on Saturday. The interior has been rearranged and gorgeously decorated at a lavish expenditure, while the exits and corridors have been improved. Mr. Walter Emden, M.S.A., was the architect for the alterations.

CONTENTS.

Vicarious Design	831
Repair or Rebuilding	831
The Society of Architects	832
Prize Work at the Royal Academy	833
A Sanitary Museum, Highgate	834
Ventilation	834
Japanese Stencil Designs	835
Colonial Membership of the Surveyors' Institution	836
Prices.—LII.	836
The Society of Engineers	837
Books Received	838
"Weight of Crowds"	838
"Hard Silver" Plating	838
The Building News Directory	XIII
Our Illustrations	858
Way-side Notes	858
Obituary	858
Architectural and Archaeological Societies	858
Building Intelligence	859
Engineering Notes	860
Competitions	860
Correspondence	861
Intercommunication	862
Legal	862
Legal Intelligence	862
Water Supply and Sanitary Matters	863
Our Office Table	864
Meetings for the Ensuing Week	864
Trade News	865
Tenders	865

ILLUSTRATIONS.

THE LEANING TOWER, SARAGOSSA.—OLD BABLAKE HOSPITAL.
—BOND'S HOSPITAL, COVENTRY.—ST. PHILIP'S CHURCH,
STEPNEY.—HOUSE NEAR ALFORD.—HOUSE AT BOURNE
END.—JAPANESE STENCIL ORNAMENT.—WOODEN MEMORIALS
AT HAMMERFEST, FINLAND.—OLD FURNITURE FROM
GAINFORD, DURHAM.

Our Illustrations.

THE LEANING TOWER OF SARAGOSSA.

"La Torre Nueva," as it was locally known, was one of the largest of the class of brick towers of Spanish workmanship but of Moorish character extant, and perhaps one of the most beautiful. It stood in the Plaza San Felipe, and two dates referring to its erection are mentioned—1497 and 1504—possibly its earliest foundation and final completion, although to an eye unfamiliar with this particular class of work an earlier date would at once suggest itself, for the whole of the detail is of the most simple character and design. Some few years ago a high, almost gaunt, timber roof or spire was removed, with a view to lighten the top structure; and a huge, finely cast bell, at least 6ft. in diameter, was destined to a similar fate; but, owing to its great bulk, the removal was not then effected. The tower, which leaned nearly 10ft. out of the perpendicular, was 70 metres high (230ft.), and an octagon of 42ft. at the base, external dimension. For the first two stages the walls were, on the side to which it leaned—that is, the south, 18ft., but on the north only 12ft.; the extra thickness on the south was added in 1860, when the tower was generally overhauled. The central stairway in these two stages is 12ft. diameter, but less than 4ft. stair; above this level the staircase was built in the thickness of the tower walls, the central portion being carried up a closed well with 2ft. walls. The external walls at this point were 5ft., decreasing to 3ft. at the top. The destruction was confirmed in May of the present year, and operations were to commence in June, though, I believe, nothing was really done until three months later, and it is now doubtful if a single brick (which, by the way, were 1½ in. by 13 in.) could now be found.—HEBER RIMMER.

OLD BABLAKE AND BOND'S HOSPITALS, COVENTRY.

THESE sketches, by Mr. G. R. Webster, are taken from his recently issued "Coventry Portfolio,"* which comprises a book of 31 drawings of picturesque antiquities in that historic city. The experiences of the author, who acted as clerk of the works under Mr. J. O. Scott during the restoration of St. Michael's steeple, has enabled him to give some interesting details, and he shows the great tower during restoration and after. The sketches which we have chosen may be taken as fair samples of Mr. Webster's studies, which have had evidently no mean share of his care and personal interest in the work. Bond's Hospital was built for ten men and one poor woman in 1506 by Thomas Bond, Mayor of

Coventry, in 1497. The front of the building, which forms the north side of a quadrangle, is 120ft. in length. It was restored in 1820 very poorly, and has been altered since. The old Bablake Hospital forms the east side of the above-named quadrangle; and it was erected about the same time. The upper story over the cloister was originally an open gallery. Ford's Hospital, in a similar style, is the most celebrated of the series at Coventry.

ST. PHILIP'S CHURCH, STEPNEY.

We continue this week our illustrations of this church, of which Mr. Arthur Cawston is the architect. We have yet another sheet of details to publish, which will appear in an early number.

HOUSE NEAR ALFORD, LINCOLNSHIRE.

THIS residence is to be erected on a site between Alford and Sutton-on-Sea. The stone will be from the Ancaster quarries. The half-timber work will be teak framing with rough-cast panels. The woodwork will be finished with Stockholm tar. The roofs throughout will be tiled with Broseley brindled tiles, and the walls of servants' department and stables on first floor will be hung with similar red tiles. The interior of the hall will be panelled with oak, and the principal staircase will be also of that wood. The bay projecting from the side of the central portion of building above the hall will contain a staircase leading to the rooms in the roof. Mr. Horace C. Frasi is the architect. Both of the drawings shown on this sheet were exhibited at the R.A. this year.

HOUSE AT BOURNE END.

THIS house has recently been erected at Bourne End, near the river, as a summer residence for Mr. R. C. Lehmann, who is well known in boating circles. The house is faced with red bricks, and the roof covered with dark tiles. Internally, all the finishings of the woodwork are of pitch-pine. The works have been carried out in a satisfactory manner under a contract by Mr. E. R. Palmer, of Beckenham, Kent, under the personal supervision of Mr. Alex. R. Stenning, F.R.I.B.A., 121, Cannon-street, E.C.

JAPANESE STENCIL DESIGNS.

(For full description, see page 835.)

WOODEN MEMORIALS AT HAMMERFEST (FINLAND).

HAMMERFEST is the centre of the cod-liver oil trade. It is built entirely of wood, and has a population of about 3,000 inhabitants. It has the reputation for being the most northerly town in the world (70° 41' north lat.), and is reached after a sail of something over 200 miles north-east after crossing the Arctic Circle, which line of demarcation is somewhat north of the natural tunnel pierced through the Mountain-Isle of Torghatten. Hammerfest is situated at the end of a lovely bay, and upon one of the many islands that form, as it were, the outside defences for the Finnish mainland, and protect it from the encroachments of the ice-bound Arctic Ocean. In the summer time, for ten long and apparently endless weeks, the sun never sets; all that time it is perpetual day. At the present moment it is one continuous night there, a darkness of something like 1,700 successive hours. The town is, however, well lit all the winter by electricity. Water power being plentiful in Scandinavia, the electric light is both popular and economical. The cemetery at Hammerfest stands upon high ground just outside the town, and commands, in summer time, a grand sea view. It consists of a square plot of some two or three acres, inclosed by a low massive wall, made, like a Derbyshire one, of loose pieces of rock. This wall is 4ft. through and 5ft. high. In one corner there is a very rough mortuary chapel, little better than a sexton's tool-house. There are a few—a very few—simple granite memorials, and some ornamental iron crosses, none of them of any interest. It was the wooden memorials that struck me as particularly quaint, and worth a corner in my pocket book. To-day's sheet of illustrations gives half a score of them just as I saw and drew them a few months ago. They are all made of deal and painted, the main colours being black and white, mainly the latter. Some, however, were picked out in gold and colour, with very good effect. Many appeared to be nothing more or less than railway sleeper-like posts, stuck upright in the ground, painted white, and the name or initials of those lying below painted or carved upon them. These reminded

me of the earliest record of the rearing of any kind of sepulchral memorial in the world's history, the story of which may be found chronicled in the Book of Genesis. There we read:—"Rachel died and was buried on the way to Ephrath, which is Bethlehem, and Jacob set a pillar upon her grave, that is the pillar of Rachel's grave until this day."—HARRY HEMS.

GROUP OF FURNITURE FROM THE "JULIA BOYD" COLLECTION.

THIS sheet illustrates some of the furniture recently disposed of by auction by Messrs. Davison and Son, of the Academy of Arts, Newcastle-on-Tyne. The Gardrobe, which is 5ft. 6in. long and 6ft. high, is treated in the upper part with three long panels gracefully carved, and with quaintly shaped heads, beneath which are three smaller oblong panels, also decorated. Beneath these is a substantial plinth containing three drawers. The upper part opens with a door on either side of centre panel. It sold for £9 15s. The Elbow Chair is richly but not deeply carved in the back, and the curved pediment is fluted; £5 10s. was the price accepted for this piece of furniture. The Settle (sold for £8 10s.), a simple but good piece, has a lift-up seat, the space under being utilised as a chest. The small circular Table (£3), with turned legs and fall-down flap, makes a pleasing addition to this group, which contains some typical examples of Old English furniture, and, like most bygone work of this kind, all are executed in oak. The sale was largely attended and very successful, and realised £4,000.

CHIPS.

The final obsequies of the late Prof. Solomon Corrodi, who was styled the father of the water-colour landscape painters in Rome, took place on Saturday, the remains having been brought from Como, where M. Corrodi died suddenly in July last.

An inquiry was held at the town hall, Barnsley, on Friday, in reference to the application of the town council for increased borrowing powers to the extent of £10,000 on waterworks account. Major-General C. Phipps Carey, R.E., one of the Commissioners of the Local Government Board, conducted the inquiry, and evidence in support of the application was given by Mr. H. Horsfield, town clerk, and Mr. J. H. Taylor, borough surveyor.

Colonel J. O. Hasted, R.E., held an inquiry on behalf of the Local Government Board at the Castleton local board offices, on Friday, into the application of the Castleton local board to borrow £22,000 for works of sewerage and sewage disposal. Mr. James Diggle, C.E., the engineer to the board, explained the scheme, which, he said, would provide for the requirements of a population of 12,000, the present population being 5,700.

The director of the National Gallery has purchased a picture, "La Jeune Dame au Clavecin," by Jan Vermeer, of Delft. The picture formerly belonged to the French connoisseur Thoré ("W. Bürger"), who first brought into notice that great Dutch painter.

Prof. Begas's third model for the National monument of the late Emperor William, which differs materially from the first and second, has received the Emperor's assent.

On Saturday, at Honiton, Sir John Kennaway, M.P., opened a new schoolroom for All Hallows School. The new building contains a memorial window to the late Bishop Mackarness, of Exeter, the work of Mr. Drake, of Exeter.

The Gravesend school board have decided to have an open competition for designs for new schools to be built in Wrotham-road, and to accommodate 700 children in three departments. The buildings are to be of one story only, and the maximum cost is £6,000.

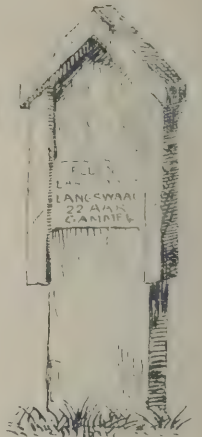
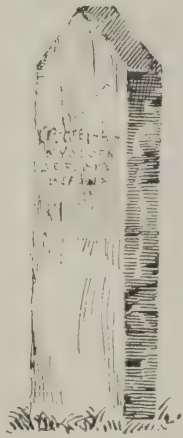
The authorities of University College, Bristol, have made arrangements for the delivery of a course of six Oxford extension lectures on "The history and principles of architecture," by the Rev. Dr. West, to take place after the Christmas vacation.

St. James's Cathedral, Townsville, Queensland, has been dedicated by Bishop Barlow. The complete design will cost £30,000. The only part now completed consists of the apse, chancel, and transept, the cost of which has been nearly £9,000. The architect is Mr. A. Blacket, of Sydney.

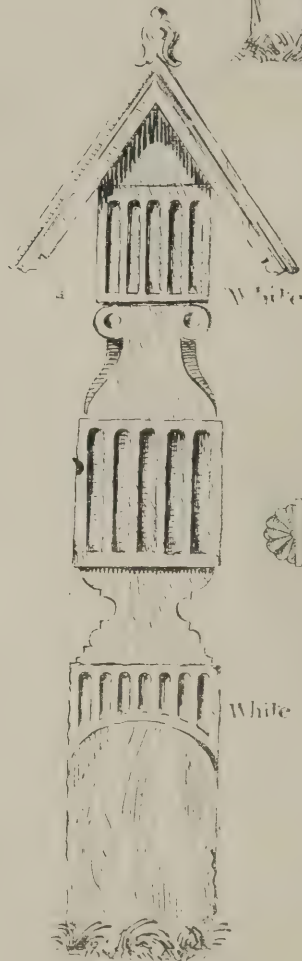
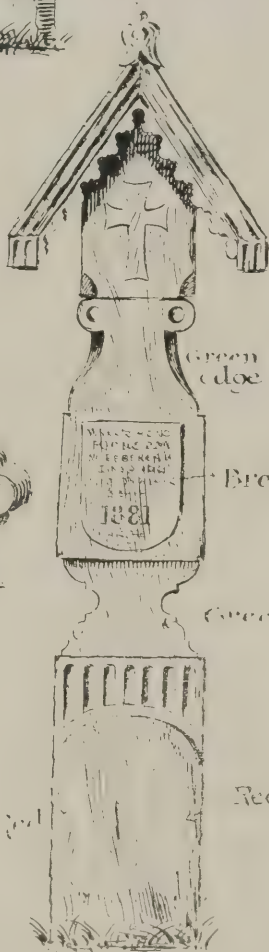
In the returns of attendances at the meetings of the City Court of Common Council, the lowest place as regards a corporator's suit and service is taken by Mr. Edward Blakeney T'Anson, F.R.I.B.A., F.S.I. (son of a recent president of the Institute), who is credited with having attended twice only and with having taken part in no division.

* The Coventry Portfolio, by G. R. WEBSTER, architect.
London.—A. Beckett, 111, Kingsland-road, N.

Sketched by
Harry Jones.
EXETER.
Augst 1892



Black's

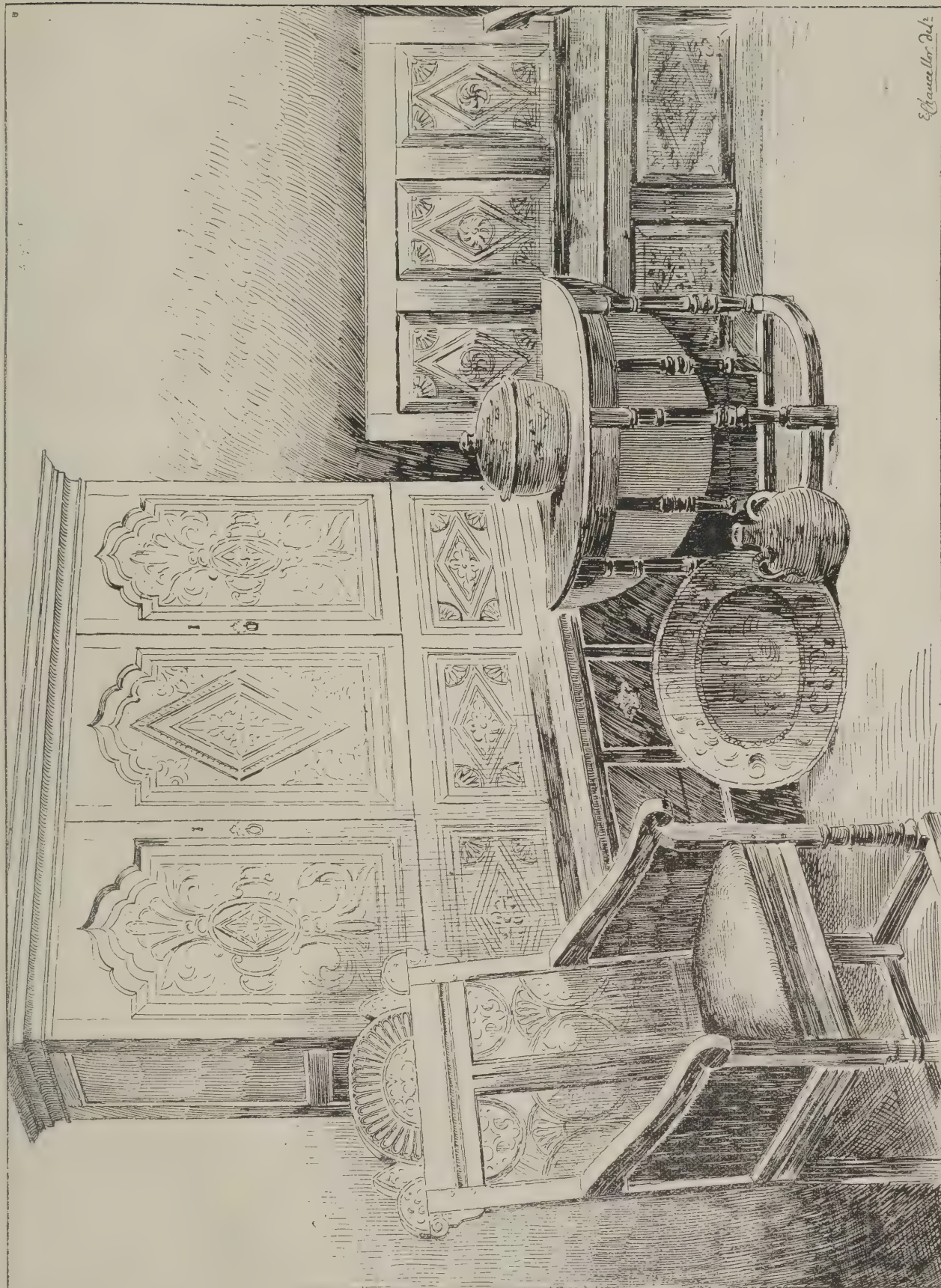


Red

Front

Back





GROUP
OF OLD
HOUSEHOLD
FURNITURE

FROM

GAINFORD
DURHAM

BELONGING TO
THE

JULIA BOYD

COLLECTION

RECENTLY ACQUIRED

BY

MESSRS. DAWSON

ESQ.

NEWCASTLE-ON-TYNE

DECEMBER 16, 1892.

Chancellor & Co.

WAYSIDE NOTES.

IN the old days of Millbank Prison there was doubtless a goodly company of housebreakers, and in the closing days of the grim and ghastly old Penitentiary we find men of similar denomination gathering round. Only the difference between the two classes of housebreakers is rather marked. On the one hand we have the burglar fraternity, and on the other the professional "housebreaker" who contracts to take down old premises for or under the value of the materials therein. Round Millbank gathered these latter last Tuesday, and competed for the grimy remains of the building. That portion of the prison put up to auction as a heap of old building materials realised in all some £630. Among the "lots" were the slates on the roof of laundry, No. 1 Pentagon, £19 10s.; the whole of the brickwork, stone coping, and sills of the kitchen, oakum shed and shaft, £41, and so on, the prices seeming very fair considering that carting away has to be done, and that the "housebreaker" speculating in old materials is not in the position of the contractor who finds himself with old premises on the site of new works and materials thus ready to hand.

The value of the ss. *Eider* in public auction, after its wrecking on the coast of the Isle of Wight, is £8,000. The ship cost £100,000. As a sea-going vessel the *Eider* is evidently useless, else the purchasers have secured an extraordinary bargain.

The Chairman of the Peninsular and Oriental Steamship Company described, at a recent meeting of the Board of Management, the loss of the *Bokhara* as "an act of God." I thought that this old, meaningless phrase, good enough in darker ages, had long ago become obsolete. It is a nice, comfortable thing for the chairman of a steamship company, which has lost a vessel and, with the vessel, many human lives, to shift the responsibility on to God. Other persons might like to know a little about the condition of the skylights over the engine-room, &c., and why they were not so built and so protected as to be proof against giving way under any weight of water that can come aboard a ship sailing on the surface of the ocean, during even a Chinese typhoon. Blessings and fortunate occurrences people seem willing enough to refer to their own intelligence and foresight, while an accident, the result of human bungling, they would disown, and style, forsooth, "an act of God"!

The Labour Bureaux of Paris are institutions that deserve imitation in this city, and are especially apropos during the time of distress from want of employment. Eleven bureaux in Paris are maintained for the outlay of under a thousand a year. Employers are found to readily revert to the bureaux, and a large proportion of applications for work are satisfactorily dealt with. If only that such a system facilitates the distinction of the really poor, unfortunate, and deserving from the professional vagrant and loafer who never intends to do a stroke more work than he can help, it is a beneficial one.

In the matter of construction of the Blackwall Tunnel, the County Council's Bridges Committee had come to the conclusion that the advice of Sir Benjamin Baker and Mr. Greathed should be followed. The Council, however, have decided to appoint a special committee to consider the matter. What are the recommendations of the two eminent engineers consulted by the Council is not stated.

Tuesday's meeting of the Council was decidedly stormy, and the rational party displayed a bold front in the matter of wages and municipal building. Sir John Lubbock's remarks on these matters I would commend to the notice of readers. Said Sir John: "If the Council could not supervise the work, still less could they do it themselves; like Rehoboam of old, who rejected the counsel of old men for that of youth, the London ratepayers would pay dearly for the 'young' ideas of its County Council." Sir John further thought that they would make a great mistake in undertaking a gigantic building business, when they had questions to solve of the gravest importance, and which would tax, not to say overtax, their utmost energies. As to the proposal to pay any wages which any London trade-union chose to fix, this is, as Sir John Lubbock said, indeed absurd. Trade under such condi-

tions would soon dwindle away into something vastly worse than even its present stagnant condition. The fair-wage movement is a blessed movement; but there is just the danger of its proving a curse to the recipients of wages generally.

Mr. John Lobb's letter in Wednesday's *Times* should have been noticed, dealing, as it did, with the past building of board schools and the cost of school-building in the past.

The Great Eastern Railway Company propose further improvements at Lowestoft—probably in connection with the fishing industry. What is Yarmouth doing? I am told that the new harbour at Lowestoft is a much easier place for boats to enter in rough weather than the narrow river mouth at Gorleston. When the originator of the idea of a harbour at Lowestoft first brought forward the idea, it was at Yarmouth that he proposed to place the harbour. The Yarmouth townsmen, however, would hear of no alteration to existing arrangements; consequently, the harbour was built at Lowestoft. Since then the fishing trade at Lowestoft has developed, to the injury, necessarily, of that at Yarmouth. When will the Yarmouth Corporation awaken to a sense of the requirements of the day? As a well-wisher of success to the old town, I draw attention to this matter of the harbour that was proposed for Yarmouth and built at Lowestoft. Is there no improvement that Yarmouth can effect in its harbour accommodation? If there is, it is surely a duty of the Corporation to seek means of carrying it into execution.

Since writing the above I notice it stated in the report of the meeting referred to that the Lowestoft estimates are for the better accommodation of trawl-fishing, at a cost of £10,000, and alterations to the swing-bridge bringing the total cost up to £22,000.

Campanologists will have noticed the deplorable accident in the bell-chamber of the parish church at Presteign, Radnorshire, whereby a young man named George Vaughan lost his life. On Sunday evening the bells had been rung and left "set." On Monday afternoon Vaughan repaired to the bell-chamber to make some necessary alteration to the gear, and it is supposed that in the course of his work he dislodged one of the bells, causing it to swing over, and that, to save himself, he had clutched the wheel of another, and caused it to fall also. One of the bells had evidently struck him on the head, killing him instantly, his body being found astride a beam among the bells.

It is to be hoped that the Hilly Fields, near Deptford, will be secured as an open space. The ground will be a great boon to residents in the neighbourhood. GOTH.

CHIPS.

Two new bells have just been cast by Messrs. Mears and Stainbank, of London, to be hung in the tower of Winchester Cathedral, raising the peal from eight to ten. The new bells will be the trebles of the peal, and respectively weigh 784lb. and 628lb.

Two well-known Liverpool city churches will soon disappear—St. Andrew's, Renshaw-street, and St. Barnabas's, Rodney-street. The demolition will take place early in the New Year. The Liverpool city council are also taking steps for the removal of two other city churches—St. George's, at the top end of Lord-street, and St. John's, adjoining St. George's Hall.

The certificates awarded by the examiners for the winter term in the Crystal Palace School of Practical Engineering are to be distributed to-morrow (Saturday) by Mr. W. H. White, F.R.S., the Assistant Controller and Director of Naval Construction of the Admiralty.

A new retort-house and other buildings have just been added to the gasworks at the Pleck, for the Walsall town council. The contractors were Mr. T. Tildesley, of Willenhall, and Messrs. Rubery and Co., of Darlaston.

Archdeacon Palmes, of York, preached on Friday in the parish church at the village of North Dalton, eight miles from Driffield, the occasion being the unveiling of a new east window in three lights. The window is from designs by Mr. E. Burne-Jones, A.R.A., supplied by Mr. William Morris, of Merton Abbey Works, Surrey, and fixed by Mr. Stabler, Driffield, art decorator.

OBITUARY.

THE death is announced from Boston, U.S.A., of Professor Eugène Létang, who, for the past twenty years, has been the head and director of the Architectural Department of the Massachusetts Institute of Technology. M. Létang had been connected with the department almost from its foundation, and had contributed in a very great degree to its success. Eugène Létang, who was only fifty years of age, was born in the department of Nièvre, France, and was educated as an architect under M. Vaudemer. At the School of Fine Arts he was particularly successful, carrying off four medals and winning a high reputation for solid attainment, interrupting his work to aid in the defence of his country during the Franco-Prussian war of 1870-1. Soon after finishing his course at the Beaux-Arts, he was induced by Professor Ware to take charge of the instruction in architectural design in the Institute of Technology in Boston, Mass., and from that time, until a few weeks before his death, he was untiring in his efforts for the school. He was a firm believer in, and an ardent advocate of, classicism, simplicity, and careful proportionment. Outside of his school Professor Létang was known to comparatively few persons. He leaves a widow, but no children.

Mr. Abraham Smith, builder and contractor, Castle-street, Farnham, Surrey, died suddenly on Tuesday week. For six years he had been a member of the Local Board of Farnham, and was also a sergeant in the local volunteer corps, of which he was an old member.

The sudden death is also announced of Mr. Richard Kelly, builder, of Mexborough, near Doncaster. Mr. Kelly, who was in his fifty-third year, had carried out many important contracts in the neighbourhood of Doncaster, Swinton, and Mexborough.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS (INCORPORATED).—A general meeting was held on Tuesday evening last at 36, George-street, at which Mr. J. Gibbons Sankey, M.A., was elected a Fellow, and Mr. Bernard H. Brameld an Associate. The third sessional paper was read by Mr. R. Knill Freeman, F.R.I.B.A., entitled "A Few Notes." A great variety of matters important to architects were referred to, including education, practice, competitions, &c., with much useful advice to the junior members. An interesting discussion of the paper was followed by a vote of thanks to the author.

SURVEYORS' INSTITUTION.—We are informed that 251 candidates have entered their names for the approaching examinations. Of this number 71 are candidates for the studentship, 133 for the Associateship, and 47 for the Fellowship, representing in the aggregate an increase of nearly 25 per cent. on the numbers of any previous year.

ARCHÆOLOGICAL.

ROMAN REMAINS AT SWAFFHAM PRIOR. — Extensive remains of Roman buildings have been found at Swaffham Prior, between Cambridge and Mildenhall. During the last three weeks there have been unearthed the foundation walls of one or two rooms, including a small hypocaust, with its firing door, and a considerable length of boundary wall towards the south. The room had a small apse of the usual kind facing the west. A similar apse occurs in the longer southern wall, and at two points within the walls there remain portions of a paving of ordinary terracotta *tessellæ*. Up to the present nothing has been found to give any clue to the date of the building, whether early or late in the Roman occupation; but there are records of the discovery of coins in the immediate neighbourhood dating possibly as early as 210 A.D. There is the usual abundance of broken pottery, fragments of flue-tiles, glass, and roof-tiles, and bones of oxen. The excavations are being conducted under the direction of Professor Hughes.

At the annual meeting of the Maidstone School of Art, held on Friday evening, it was announced that the corporation of that town had, after competition, selected the design of Messrs. Rack and Smith (both former students of the school) for the erection of a new school of science and art, to be built on the Museum grounds in St. Faith-street.

Building Intelligence.

ASTON.—The foundation-stone of a new technical school was laid on Friday. The building will have a frontage of 98ft. to Whitehead-road and of 90ft. to Ettington-road, and consist of three stories, with chief entrance at the angle. The accommodation of the basement will comprise a modelling-room, with recess for casting; engineering classroom, with engine-house and electric-lighting appliances adjoining; metallurgical classroom; plumbing workshop; laundry, having washhouse, drying-closet, and ironing-room; spare classroom, heating vault, stores, &c. The ground floor is to have a lecture-room, two rooms for elementary art, secretary's and curator's rooms, teachers' rooms, and four classrooms. On the upper floor is to be a chemical laboratory for 40 students, with preparation room, balance-room, teachers' room, and stores adjoining, a lecture-room, and also art classrooms. On each floor lavatory accommodation will be provided. At the rear of the premises a separate one-story building is to be provided for carpenters and joiners' work, and this will accommodate 60 students. The buildings will be warmed by low-pressure hot-water pipes, and electric light will be provided throughout. The style adopted is English Renaissance, with large windows. The main entrance block and the gables at the ends of the façades will be somewhat elaborated to give emphasis to the leading features of the design, but the whole of the building is to be solidly and substantially treated. The elevations are to be faced with pressed Stourbridge bricks, relieved with stone and terracotta. The amount of the contract is £5,545; the contractor is Mr. F. N. Stephens, Park-road, Aston, and the architect Mr. George H. Cox, of 28, Temple-street, Birmingham.

BATLEY.—The new public baths, the technical school, and the girls' higher grade school at Batley, are now all nearing completion. The new public baths, which have their frontage to Cambridge-street, are 134ft. by 126ft. The greater portion of the building is only one story high. There will be two swimming-baths. The first-class one will be 63ft. by 25ft. The second-class will be 75ft. by 30ft., and will have a spectators' gallery. Both these baths will be lined with glazed bricks. Twenty slipper baths are also to be provided. The architect is Mr. Walter Hanstock, Batley.—The new technical school stands within a short distance of the baths. The main entrance is in Cambridge-street. The chemical laboratory is being fitted up on the ground floor. On the first floor is a lecture-hall capable of accommodating 100 students. A spacious room will be used as a workshop. There will also be a number of class-rooms.—The location of the girls' higher grade school is Field Head. A similar school for boys will be provided hereafter by erecting a duplicate of the present structure. The style is Renaissance. In the centre is an assembly-room 40ft. by 30ft., with class-rooms on each side of it. At one end of the large room is a gallery. Mr. H. B. Buckley, architect, of Leeds and Batley, prepared the plans for the technical and higher grade schools, which were both illustrated in our issue of Jan. 15, 1892. The next public building erected in Batley will probably be a Town Hall. The present Town Hall is not adapted to its purposes. It was erected by a company, and some time ago it was taken over by the Corporation, which now uses the small rooms for municipal offices, while the large hall serves as a council chamber.

LEEDS.—Blenheim Chapel, in Woodhouse-lane, Leeds, which has been undergoing extension and improvement for some months, was formally reopened on the 1st inst. The alterations consist in the extension of the chapel in length the width of one bay, and an increase of 100 to the sitting accommodation; while the whole of the gallery has been re-seated and cushioned, and made equal to the seats on the ground floor. Special attention has also been paid to the heating and ventilating, the old hot-air apparatus having been taken out, the chapel and the whole of the premises being now heated with hot-water pipes, which have been laid by Messrs. Heaps and Co., of Huddersfield. Ventilation is secured by means of fresh-air inlets and by extracting the foul air by means of a ventilating shaft taken up the tower. The greatest improvements which have been made to the chapel are the entrances. A tower with a broad

spire has been erected on the corner of Blackman-lane. A porch the full width of the chapel, and an inner lobby 8ft. wide have been built on the chief façade. Wide stone staircases lead up to the galleries. The contractors were—Messrs. Nettleton and Sons, masons; Messrs. J. H. Atkinson and Son, joiners; Messrs. W. and C. Burdard, plumbers; Messrs. Atkinson and Son, slaters; Mr. Thomas Moore, plasterer; and Mr. C. Fenton, painting and decorating. Mr. W. A. Hobson, of Leeds, was the architect.

LIVERPOOL.—The new Victoria Building of Liverpool University College was opened by Earl Spencer on Tuesday. The western wing of the building contains the Tate library. A feature of the southern elevation is the Jubilee Tower, the clock and bells in which have been given by Mr. Hartley. In the east end of the building, on the upper floor, a semicircular theatre, with raised seats, has been constructed. The great hall, a chamber two stories in height, is 68ft. by 30ft. East of the hall, in the portion of the building placed under the large theatre, are the students' common-room and reading-room. The first floor contains classrooms (the largest of which is 43ft. by 22ft.), and one or two professors' rooms. Over the archway is a reading-room, connected with the senate chamber, which latter is 27ft. square. On this floor the ladies have a common-room and a reading-room. On the second floor the theatre and the library are situate, and the third floor is mostly occupied by the upper part of the library and the lecture theatre. The statue of Mr. Christopher Bushell, executed a few years ago by Mr. Bruce Joy, and placed in the great hall of the Free Public Library, William Brown-street, has just been removed to the new building. The building is fireproof throughout, the floors being of concrete, on an iron framework, supplied by Messrs. Handyside and Co. The cost has been £60,000. The general contractors were Messrs. Brown and Backhouse, and the whole of the works have been carried out under the supervision of Mr. Battye. Messrs. A. Waterhouse and Son are the architects, the design having been prepared by Mr. Waterhouse, R.A., in 1888.

KEIGHLEY.—At a special meeting of the Keighley Town Council, held on Friday night, it was decided, after a long discussion, "That a temporary hospital for infectious diseases be erected on the site of the proposed hospital at Woodhouse at an estimated cost of £650, and that Messrs. Judson and Moore, the architects, be instructed to proceed with the necessary work with all possible speed." The mayor explained that the temporary hospital would be of corrugated iron, lined with boards, with an accommodation for twelve beds. The cost of this would be £650. There would also be an outlay of £125 for road-making and drainage; but this would form part of the permanent scheme, for which Messrs. Judson and Moore's designs were adopted in competition two months since.

MANCHESTER CATHEDRAL.—The new pulpit in the nave of this cathedral has been formally presented by Mr. Chancellor Christie. The general design is Perpendicular, in harmony with the building. The pulpit stands on a substantial granite plinth, which supports the main shaft of alabaster and eight pillars of Victoria red marble. The capitals of the columns are of white alabaster, decorated with foliage and miniature heads. The pulpit itself is entirely composed of variegated alabaster, a cream-like white prevailing. The angles are filled in with six alabaster statuettes representing the Saviour and Apostles. Above the heads of the statuettes are carved canopies; while the cornice is finished with battlements. The staircase of nine steps, of York Greenmoor stone, is of variegated alabaster, filled with tracery work. At the termination of the hood-moulds are heads of different designs. At the foot of the staircase pedestals are placed, on which are angels, one bearing the coat-of-arms of Mr. Chancellor Christie, the other the coat-of-arms of the diocese of Manchester. The work has been executed under the direction of the cathedral architect, Mr. Crowther, by Messrs. Earp and Hobbs, of Manchester and London. One of the last important works of the Cathedral restoration—the erection of the new south porch and baptistery—is now practically completed. The porch is faced externally with Darley Dale stone, from the Derbyshire quarries of the late Sir Joseph Whitworth; and with Carlisle stone inside. The design is in accordance with

the general architecture of the cathedral. The adjoining new baptistery is quite a new feature in the church, the baptistery hitherto having been at the north-west end of the nave. In the interior of this baptistery, now just on the point of completion, the pavement immediately surrounding the font is of Roman mosaic. At the four angles are panels, representing the Four Evangelists, with the text "Baptising them in the name of the Father, of the Son, and of the Holy Ghost." Outside this panel the baptistery is paved with dove, red, black, and white marble. The font, which formerly stood near the north entrance to the nave, has been removed to the new baptistery. It may be here mentioned that this font was dedicated about 40 years ago. The carved oak cover over the font was presented to the cathedral 45 years since as a memorial of the late Mr. George Lings, many years comptroller and father of the present comptroller. The marble pavement, mosaics, &c., in the baptistery have been executed by Messrs. J. and H. Patteson, Marble Works, Manchester. This firm has also executed the marble and mosaic flooring throughout the building. The masonry of both porch and baptistery has been executed by Messrs. John Nicholl and Son, of Rochdale; and the whole has been carried out under the directions of the cathedral architect, Mr. J. S. Crowther. The total cost of these two works has been £5,100, the porch having cost £2,600, and the baptistery £2,500.

NEWCASTLE-UPON-TYNE.—The foundation-stone of the further extension of the Durham College of Science was laid on the 5th inst. by the Earl of Durham. The portion now in course of erection will about equal in bulk the portion first erected about five years ago. In the centre is the Royal Jubilee Exhibition Tower, which forms the permanent and only memorial of the Jubilee Exhibition. It is built from the surplus of the Jubilee Exhibition, and comprises a gateway surrounded by four octagonal turrets, each 95ft. in height, and surmounted by ornamental ironwork. The turrets are to be made to serve respectively for (1) chimney, (2) ventilating shaft, (3) experimental tower with a mercury column 100ft. high for testing gauges, and (4) coal-hoist and staircase. On one side of the gateway, on the ground floor, are the following:—Metallurgical laboratory and balance room, with furnaces adjoining the chimney shaft; engine and dynamo room, 40ft. long, 35ft. wide, and 21ft. high. Here, also, is the George Stephenson engineering laboratory—an apartment 123ft. long and 35ft. wide, with an annexe measuring about 90ft. by 10ft. This will contain a 100-ton testing machine, experimental marine engines, oil-testing machine, bar-testing machine, cement-testing machine, hydraulic and other dynamometers. On the first floor are—lecture-room, 35ft. square, building construction, &c.; lecture-room, 40ft. by 35ft., for engineering and naval architecture; engineers' drawing office and model-room, 123ft. by 35ft. The second floor will comprise the following rooms:—Life classroom, adjoining the art masters' room; art lecture-room, 40ft. by 35ft.; and suite of art galleries, all provided with roof lights on the north side for the whole length, and measuring 123ft. by 33ft., with a clear height of 20ft. in the centre. The architects have been the late R. J. Johnson, F.S.A., and Mr. Frank W. Rich.

OXFORD.—Mr. T. G. Jackson, A.R.A., has made a report to the members of Convocation on the condition of the tower and spire of St. Mary's Church. The tower and spire, which date from the 14th century, were repaired and restored about 40 years ago by Mr. Buckler. The material employed was Taynton stone, which has gone to complete ruin in all exposed parts, while the masonry of the spire itself, which dates from the time of the Edwards, is still in good condition. But the ruin of our modern work is also in part due to a false economy in construction—that is, in the way in which the stone was cut and bedded. Among other parts it will be necessary, in Mr. Jackson's opinion, to replace the statues, which, though extensively patched, are still valuable as fine examples of 14th century English sculpture. The material Mr. Jackson recommends as most to be relied on (Portland stone not being suitable to a Gothic building) is the hardest beds of Clipsham. The cost of the repairs to the tower and pinnacles round the spire he estimates at £8,732, the erection and maintenance of the scaffolding alone costing

£800. Besides this, the repair of the nave, parapets, and pinnacles is estimated at an additional £1,200.

SALFORD.—At the last meeting of the town council, Alderman Dickens, chairman of the health committee, moved the approval of plans prepared by Mr. Corbett, the borough engineer, for the erection of two blocks of four-story artisans' dwellings in flats on ground bounded by Queen-street, Starkey-street, Rolla-street, and Collier-street, and that the town clerk be instructed to apply to the Local Government Board for sanction to borrow £10,000 for the erection of the houses. He stated that the plans had been copied in great measure from the designs adopted by the London County Council, it being thought desirable that they should begin with some buildings on that principle by way of experiment. One objection taken to the plans was that they included so many single rooms and so few double rooms, but the reason was to keep the rents down, as the intended tenants would not pay more than 2s. 4d. a week. The inspector of the Local Government Board had declared that the plans were the most admirable he had yet seen. In the course of a short discussion, strong opposition was offered to the plans, Mr. Harrison declaring that houses erected according to such plans would be more insanitary than those that were being pulled down. Ultimately the resolution was withdrawn, and a committee was appointed to confer with the health committee with a view to the improvement of the plans.

SOUTHWARK.—The Royal South London Ophthalmic Hospital, built from the designs of Mr. Keith D. Young, F.R.I.B.A., was opened by the Duke of York yesterday (Thursday). It is four stories in height, and is built of brickwork. It contains in the basement a waiting-room for outpatients. On the ground floor are two consulting rooms, each with bandage, ophthalmoscopic, and consulting room attached. There are also on this floor a dispensing room and secretary's and officials' room. On the first floor are the surgeon's and matron's apartment, and on the two floors above beds for patients, with kitchen, &c., on the top floor. The floors are made of iron and concrete, and the whole of the fittings are of teak wood, which is rendered non-inflammable. Ample provision is made in the event of an outbreak of fire. The building is entirely warmed by hot water and lighted by electricity. There is not in the building an angle or projecting ledge which could harbour dust or injure a blind or semi-blind patient. The external red facing bricks were supplied by Messrs. Lawrence, of Bracknell, the stocks by Messrs. Smead and Dean, of Sittingbourne, the moulded red bricks by Mr. J. Brown, of Braintree, and the glazed bricks (used internally, by Messrs. Joseph Cliff and Sons. The terracotta was specially modelled to the architect's design by Messrs. Edwards, of Ruabon. The roof is laid with Claridge's asphalt, and the fireproof floors are by Messrs. Lindsay and Co. of Paddington, and the lifts are by Messrs. Archibald Smith and Stevens. Mr. W. Downs was the general contractor.

WELBECK ABBEY.—The new private chapel at Welbeck Abbey, which has been constructed in part of a spacious apartment latterly known as the church library, and originally a riding school, has now been formally opened. The building, which is from the joint designs of the late Mr. John D. Sedding and his pupil and successor, Mr. H. Wilson, has been divided by a row of marble columns, supporting an alabaster cornice and entablature, into a nave of five bays and two aisles; and the seating is arranged on the conventual system, two rows of canopied stalls running east and west in the aisles. The altar-piece is a silver electrolyte from a plaster model depicting the Divine Message to the world.

At the Tudhoe works of the Weardale Iron Company new slabbing plant, the largest in the county, has just been put down. It has been designed by Mr. H. W. Hollis, the general manager, and has a productive capacity of 1,000 tons weekly.

The new Parish Institute in connection with Christ Church, West Green, was opened by the Princess Christian on Wednesday, Dec. 7. The building is of simple oblong form, and is designed to be somewhat in keeping with the church. It seats nearly 900 people. The architect is Mr. George H. Fellowes Prynn, F.R.I.B.A., of 6, Queen Anne's-gate, Westminster. Mr. S. Wood has acted as clerk of works.

Engineering Notes.

CABLE TRAMWAY FOR STREATHAM.—Major Hutchinson, of the Board of Trade, made his formal inspection on Friday of the new cable tramway from Kennington Park to Streatham Hill, and it will probably be opened next week. Mr. Colam is the engineer, and Messrs. Dick, Kerr, and Co. are the contractors. The engine-room, boiler-house, car sheds, and offices are placed at the top of Streatham Hill. The cable system is applied to the Brixton and Streatham line of tramways from Kennington Church to the terminus at Telford-avenue, Streatham, a distance of a little over three miles, the cars being driven from Kennington to the Bridges by horse traction as at present. The cars will be attached at Kennington to a specially-designed bogie car, which is provided with the arrangements for gripping the cable.

THE VYRWY WATER SUPPLY FOR LIVERPOOL.—At a meeting of the Liverpool Engineering Society held on Friday, Mr. G. F. Deacon, M.Inst.C.E., read a paper entitled "A Sketch of the Vyrwy Works." Mr. Johnson, president of the society, occupied the chair. Speaking of the Vyrwy Lake, the lecturer said that the dam impounded the upper waters of the Vyrwy to a maximum depth in ordinary weather of 84ft. The contents of the lake were 12,131 million gallons from the level of the sill of the dam, about 825ft. above the sea, to the lowest level at which 40,000,000 gallons a day might be drawn for Liverpool. The lake was 4½ miles in length and from one-fourth to five-eighths of a mile in width. The area that naturally drained into it was 18,000 acres; but the Liverpool Corporation was empowered to take the water from two other streams—the Avon Conway and Marchant—which, when connected by tunnels with the lake, would increase the drainage area to more than 22,000 acres. The compensation water to be given to the river averaged 13,500,000 gallons a day. In addition to this 13½ millions, the lake would provide not less than 40 millions for the use of Liverpool in the most prolonged droughts. The first 18 miles of the Vyrwy aqueduct passed over mountainous country, the hills being tunnelled where necessary. From Oswestry for about 20 miles the line was kept as near as possible to the comparatively high land near the watershed between the Severn and the Dee. It then crossed the rivers Weaver and Mersey, and terminated at the Prescott Reservoir, nine miles from Liverpool. The total distance along the line of aqueduct from Lake Vyrwy to the Liverpool Town-hall was 77 miles. To Prescott the length was 68 miles. The only work involving very serious difficulty and danger in the undertaking was the construction of an aqueduct under the River Mersey. As finally carried out, the tunnel was unique in respect of the combination of its depth below the river, with the nature of the material passed through, which was heterogeneous in the last degree, and was perfectly loose.

CHIPS.

At a dinner given to his employes last week, Mr. C. Brightman, builder, of Watford, was presented by the men with a marble timepiece as a token of esteem. About 100 sat down to dinner.

Interesting discoveries have been made by Prof. Botts, who, while excavating in the neighbourhood of Pompey's Pillar, found a number of sarcophagi in the catacombs, and also remains of Christian dwellings.

Colonel Ducat, one of the Local Government Board inspectors, held an inquiry at the council house, Birmingham, on Friday in respect of an application by the city council for sanction to borrow £9,737 for the provision of branch libraries; £5,500 for the cleansing of the River Tame and the payment of certain law costs; and £4,500 for the purchase of water rights, and the settlement of a claim of the Warwick and Birmingham Canal Company. Mr. E. O. Smith, town clerk, explained the proposals.

Mr. Nicholas Joyce, A.R.I.B.A., of Stafford, has been appointed a surveyor under the Ecclesiastical Dilapidations Act, 1871, for the diocese of Lichfield. The appointment is for a period of five years, dating from Jan. 1, 1893.

The memorial at Kidderminster to the late Dr. T. L. Claughton, successively Bishop of Rochester and St. Alban's, will take the form of a chancel screen in the old parish church, designed by Sir Arthur Blomfield, A.R.A.

COMPETITIONS.

CROMPTON LOCAL BOARD OFFICES.—Fifty-two sets of designs were received by the Crompton local board in an open competition for designs for new board offices. The first premium has been awarded to Mr. H. Cheetham, Oldham; the second to Messrs. Woodhouse and Willoughby, Manchester and Stockport; the third to Mr. John Johnson, A.R.I.B.A., Victoria-street, London. Mr. John Wild, architect, Oldham, acted as assessor.

LONDON BOARD SCHOOL AT BROMLEY.—At the last meeting of the London School Board, the works committee submitted a report on the conditions for the competition proposed to be instituted for a school to be built in Priory-road, Bromley. The committee propose to adopt the R.I.B.A. suggestions for the competition, omitting, however, *b* and *c* of section 5, and sections 10 and 11. An assessor (the President of the Institute for the time being, or such person as he may nominate) will be appointed to advise the committee, and draw up the terms and conditions. The competition is to be for a school for 800 children, showing means of enlargement to accommodate 1,200 and 1,600 children, with all necessary class-rooms, staircases, cloak-rooms, and lavatories, and three halls; also alternative plans showing arrangement of one hall for the three departments, subject to, and in conformity with, the rules and regulations of the Education Department. The designs are to be accompanied by general specifications and reports showing system to be recommended for heating, ventilation, and drainage; also estimate of probable cost. Three premiums of £150, £100, and £50 will be awarded in the discretion of the assessor, and the whole of the plans will be publicly exhibited after the assessor shall have made his award, and before the same shall have been opened. The committee further stated that it is proposed to place in the hands of each competing architect a copy of the standard specification which was prepared by Mr. Ewan Christian and Mr. Rickman (who acted as professional advisers to the special committee in 1888); it being understood, however, that each architect will be at liberty to adapt it to his own requirements, he being held solely responsible for the drafting of the specification. Further, that if a set of plans be adopted by the Board, it is proposed that the architect should be paid the usual professional commission of 5 per cent. on the cost of the building; and that the work should be carried out entirely under the direction of the architect selected, and not under the superintendence of the architect or assistant architect of the board, and that a clerk of works to supervise the carrying out of the work will be appointed, and paid direct by the Board. The committee also reported that, in addition to the premiums proposed to be awarded, an expenditure, which will probably not exceed £200, will be required for the payment of the assessor who may be appointed to advise the committee upon the competitive designs, and for other expenses.

WALSALL.—We hear that the mottoes which have received the approval of the assessor for the Town Hall at Walsall are stated to be—1st, "Bruin"; 2nd, "Straight and True"; 3rd, "W."

WALTHAMSTOW.—We understand Mr. Wm. Landless, architect, Leeds, has been appointed assessor in a limited competition for an industrial school at Walthamstow.

The local board of Rugeley have decided to apply to the Local Government Board for sanction to borrow the sum of £5,750 for constructing works of water supply, from plans prepared by Mr. W. H. Radford, under whose directions the preliminary borings for water have been made.

Good progress is being made with the tower at Wembley Park, which is to be of steel throughout, the total height of the metalwork being 1,150ft. set on a base 162ft. in height. The firm commissioned to construct the tower is that of Messrs. Heenan and Froude, of Manchester, and the contract for the steel required in the construction has been placed with the Stockton Malleable Iron Company, Limited, Stockton-on-Tees.

A meeting of the Architectural Section of the Glasgow Philosophical Society was held on Monday night, Mr. Campbell Douglas, F.R.I.B.A., president, in the chair, at which Mr. J. Lindsay Miller, secretary of the section, gave a paper entitled "Notes on our Cathedral," dealing with the subject historically and architecturally.

Correspondence.

WESTMINSTER ABBEY.

To the Editor of the BUILDING NEWS.

SIR,—I was glad to see in your last number an illustration of the north transept of Westminster Abbey, as it offers a subject for special study to the student. To my mind, this transept façade is the best specimen of Gothic in England. It is more stately, has more elements of interest, more variety of detail than any other. The finely-recessed doorways, the arches in front of windows, the arcade above them, the double flight of buttresses are all notable features. Large churches in England are lamentably deficient in height and miserably inferior in the size of their doorways compared with French examples. Westminster Abbey Church is remarkable in that, though in detail it is thoroughly English, yet was designed under French influence, for in respect of height and importance of the entrances it is superior to any other English church, though not to be compared with those abroad. Possibly the original west doorways were superior to those of transept, features we might have gloried in, had not the Wren been robbing us. I should be heartily glad to see Wren's towers put into Mr. Pearson's hands for rectification.

There is another particular in which a marked difference exists between English and French churches. All the French cathedrals have rows of chapels down the aisles. Now there is no example of this in England. This is a remarkable distinction, and it seems to me to show our independence of thought and relative freedom from superstition, though pictorially our buildings suffer. It seems to be, however, a fact that superstition in this *fin de siècle* is growing upon us, and an illustration of objectionable Mariolatry is shown in this transept doorway, in the big figure of the woman and child. If the church had been dedicated to "Notre Dame," there might be some excuse for it; but the saint honoured is St. Peter, and it is the old fisherman and fisher-of-men that ought appropriately to stand on the centre pedestal. I was not sorry that the sceptre of the make-believe queen was broken off as soon as the figure was set up. Works of art to be respected must be respectable.

Though the effect of these doorways is good, they might be greatly improved by the addition of steps: there is but one now. If the pathway across St. Margaret's churchyard was made level instead of, as now, sloping, five or six additional steps could be got. Steps give great dignity. The splendid portals of Amiens would assuredly lose much of their effect without the steps by which they are approached. Steps at the transept no doubt did originally exist,—they are now at south aisle door—but the increment from burials in churchyard or in the levelling-up for the bridge have obliterated them north. Their restoration is a consummation devoutly to be wished.—I am, &c., M.

DRAINAGE AND PLUMBING SPECIFICATION.

SIR,—In view of the questions which might arise as to the reason why of many clauses in my specification which could not be explained in foot-notes, I have had it in my mind to offer some explanations as soon as the specification is completed.

I am indebted to Mr. Dicksee for his letter, as it is of great assistance to me in showing where further information is needed, and I should be obliged to him if he would continue his criticisms, either in the columns of your paper or privately. It is also very interesting to have these details discussed.

I am quite at one with Mr. Dicksee in his admiration for small pipes, although I think he carries it to an unreasonable and, possibly, dangerous extent, and fails to realise that a bright and well polished pipe is not the Alpha and Omega of the plumbing alphabet, as siphonage, the time in which it is required to empty baths and lavatories, the rules of vestries and other local authorities, which are often very unreasonable, and many other circumstances have to be considered.

I see that Clause 95 should have had a foot-note, explaining that the curved pipe would only be recognised when the soil or other pipe is in the same position in relation to the inspection-chamber as shown on Fig. 19, as is frequently

the case in London houses where there is no choice of position, either for the soil-pipe or the inspection-chamber.

Sometimes it is necessary to put the chamber even further up the drain. In such cases the pipe must have a greater curve than is shown on Fig. 19. I have found that if my channel bends (made by Messrs. Bolding and Son) are used, this plan will work well, and that the inspection-chamber and channel will be quite clean after long use.

I should prefer to postpone my reply to Mr. Dicksee's other criticisms until I see if more are offered, that I may deal with them altogether.

I am also indebted to Mr. Dicksee for exhibiting one of the main objects I have had in view in compiling this specification, which was to draw attention to the necessity for the greatest care in dealing with the details of plumbing work; and the more my work provokes criticism and inquiry, the more useful it will be; and while those who make use of it will be reminded of the different points to be considered, they will be able to vary the clauses either to suit their own ideas or the circumstances of the case with which they have to deal.

But in saying this I must add a caution against hasty judgment and untested theories.—I am, &c., ARTHUR BAKER.

ECHOES IN BUILDINGS.

SIR,—With reference to this matter, we may mention that in 1883 was applied to the Church of St. John the Evangelist, S.W., our "Eolus" waterspray system of ventilation, the result of which, with reference to this particular point, we quote from the *Builder*:—

"To the managers of theatres, and especially those of the lyric stage, good ventilation is also a matter of special importance, because it immensely improves the acoustic qualities of buildings. . . . A notable instance of this is the Church of St. John the Evangelist, Wilton-road, S.W. There, previously to its being ventilated, the preacher's words were almost indistinguishable to any but those who were in the immediate vicinity of the pulpit; but as soon as proper ventilators were fixed in the roof the echo disappeared, and the words of the preacher became audible throughout the church, from one extremity to the other."

The same question had also previously received considerable attention from foreign, and more especially, German scientists.—We are, &c., BAIRD, THOMPSON, AND CO., Ventilating Engineers.

165, Queen Victoria-street, E.C., Dec. 13.

DRAINING AND PLUMBING SPECIFICATIONS.

SIR,—Mr. Bernard Dicksee, in letter on the above, criticising Mr. Baker's specification, says that "no trap should be placed at outgo of sink or lavatory basin," and, further on, "the same applies to bath wastes." Perhaps Mr. B. D. will let your readers know what means he adopts to prevent current of air from R. W. head and waste pipe continuation (which in time gets foul) from passing up these open wastes direct into the building. Flap valves at outer end of pipe would partially prevent this in summer, and no doubt wholly in the winter, being sure to freeze and completely block end of pipe when the frost is at all severe. Plugs are all very well, but will be found to be generally left out until it is required to use the lavatory or bath.—I am, &c., F. S. I.

The summons against the London School Board for failing to comply with notices by the Lambeth Vestry, ordering certain sanitary works to be done at the Johanna-street schools, came on for further hearing on Wednesday at the Southwark police-court. The magistrate said he should order the board to pay five guineas costs, but the work demanded by the vestry having been done, he should make no order on the matter.

Mr. Acland received on Wednesday a deputation from the Metropolitan Vestries, the National Sunday League, and the Sunday Society, who came to urge the desirability of opening museums and art galleries from two till ten o'clock on Sunday. In reply, Mr. Acland said the speeches he had heard showed the increasing volume of public opinion in favour of the course the deputation had advocated. He would lay the views of the deputation before his colleagues, and it appeared to him that they had said much in favour of Sunday opening.

Intercommunication.

QUESTIONS.

[10913].—**Graecostasis.**—Where situated is or was this building, and for what purpose used?—STUDENT.

[10914].—**Rolled Beam.**—Would any authority on "strength of materials" please work out for me the following: A rolled beam, fixed at both ends, is to carry with safety a weight of 10 tons equally distributed over its length, which is 20ft. Calculate the size of its section from the following formula—

$$W = \frac{cad}{l}$$

and once this section is obtained, prove its accuracy by finding the distributed weight from the same formula. This has puzzled me very much lately, and should, therefore, be glad to have it properly worked out.—SCOR.

REPLIES.

[10907].—**Deadening Sound.**—Slag-wool is the best material to use. You can find addresses of those who supply this in the Directory, and they will tell you prices and method of fixing. Ballast or sand would be of no use. You will find slag-wool cheapest in the end, because effectual.—C. F. M.

[10907].—**Deadening of Sound.**—All air-harbouring bodies are good non-conductors of sound, but the best of these is "silicate cotton," manufactured from blast furnace slag. This indestructible glassy fibre is not only sound-proof, but fire-proof, and also antiseptic. It is largely used, and can be easily placed on the sound boarding.—M. H.

[10937].—**Deadening Sound.**—Nail strips to side of joists and board with rough pieces. Then put slag-wool or other like material on these boards to a thickness of 2in. or 3in., or more. Sometimes I have used mortar and chopped hay in the country, and with success.—G. H. G.

[10909].—**Orientation of Churches.**—Although it has been the most usual custom for Christians to pray towards the east, which accounts for the general ritual observance, there are many churches which do not orientate. In the basilican churches of Sta. Maria Maggiore, Sta. Cecilia, S. Giovanni Lalerano, and others in Rome, the altars are placed at the west end. In this country I may refer to SS. Mary and Nicolas, Wilton, Wiltshire, which church is built west and east, to St. Mary, Astbury, Cheshire, and many others, which do not observe the rule. One or two of our abbey churches are built north and south, but I do not remember which they are. In these cases the site has determined the position of the main axis.—G. H. G.

[10909].—**Orientation of Churches.**—St. Dunstan's-in-the-West, near Chancery-lane, and just inside the site of Temple Bar, has the altar to the north. Perhaps the chance is only a poor recess. St. Bartholomew the Great is all channel, as the nave forms the churchyard approach. Here the number of degrees towards north would be worth ascertaining.—H. W.

[10911].—**Light.**—Where a dominant owner has obtained an indefeasible right to a light by prescription, he cannot be interfered with. He is not only entitled to sufficient light for the due exercise of his business, but also to the greatest amount of light he can obtain, and the angle of 45 degrees is not a legal limitation, but is usually taken as an approximate limit of the new buildings. See "Yates v. Jack" (L.R. 1, ch. 295, 1886), and "Theid v. Debenham"—R. J. ANGEL, Birkenhead.

[10911].—**Light.**—In point of law, the courts have rather considered the substantial deprivation of light to an ancient window than any angle of 45 degrees, and I should be inclined to erect an experimental hoarding allowing that angle, and obtain the adjoining neighbours' sanction. In the case of "Parker v. First Avenue Hotel Company," Lord Justice Cotton reversed the decision of Justice North, who qualified the injunction allowing a roof at an angle of 45 degrees. In another case the Court ruled that the rule of 45 degrees was an element in the case, but a very small one, and no rule of law. Material damage must be shown to be caused. Notwithstanding these opinions, "J. W." will be safe in not exceeding that limit of height, but rather keeping within it.—G. H. G.

A workman's institute is about to be provided for Middlewick, on a site at present occupied by stables adjoining Naylor House. The plans have been prepared by Mr. R. T. Worth, surveyor to the Middlewick local board, and Mr. James Greenwood is the contractor.

Although not more than a third of the £20,000 required to carry out Mr. J. L. Pearson's plan for the restoration of Bristol Cathedral has been raised, there is a prospect of the work being shortly commenced. The proposal is to first take in hand the central tower and Lady chapel, the renovation of which is estimated to cost £6,500, and while that is in progress to make further appeal for funds, so that as soon as the first portion of the work is completed another section may be entered upon without delay.

For several months past St. Thomas's Church, Penkull, has been closed to permit of an enlargement. At a cost of upwards of £1,600 two new aisles and baptistery have been erected, the gallery has been removed to the south transept and a choir vestry constructed beneath it, and the whole church has been re-floored and re-seated. Additional accommodation has been provided for 166 worshippers. The church was reopened on Saturday, when the new baptistery, aisles, and other additions were dedicated by the Bishop of Shrewsbury.

Legal.

MORTGAGE OF BUILDING AGREEMENT.

A VERY important practical point has just been raised, and, so far, decided, in the case of "Church v. Sage—Froy, claimant" (*Times*, December 4), before Mr. Justice Wright, though it may possibly go up to the Court of Appeal. Sage, the debtor, had entered into a building agreement with a landowner to erect a house and take a lease. Being in want of money to complete the work, he assigned, by way of mortgage, to Froy all his interest in this agreement, and also all the plant and materials then on the land or to be brought in after, as security for repayment of a loan. There was no express power of seizure or sale in default of repayment. But there was an express guarantee to take possession of the premises, and of all plant and material, in the event of Sage not completing according to his agreement with the landowner, or in the event of his bankruptcy, or for other similar causes. The plaintiff had seized plant and material on the ground, which Froy now claimed under his mortgage, but which the execution creditor resisted, on the ground that this mortgage was a bill of sale, and so was void for not being registered. Thus the case came on as an interpleader, to decide the validity of this very ordinary form of mortgage.

It has, of course, long been settled that an ordinary agreement between a landowner and a builder is not a bill of sale, because of the contract it contains under which the chattels vest absolutely in the owner as part of the land, and so cease at once to belong to the builder. But in this case the document was a mere mortgage by a builder of his interest in the agreement to a stranger, to enable the builder to carry out his work, and so was subject to the usual incidents of a mortgage. The Judge held that "Reeves v. Barlow," and similar cases, only applied to building agreements and not to mortgages of this kind, which was, in fact, avowedly given as security for the repayment of money. Apart from direct authority, such a document would certainly seem to come clearly within the Bills of Sale Act. In the later case of "Climpson v. Coles" (1889, L.R. 23, Q.B.D. 465) there was a mortgage, and the Court seemed to think the same rule as governed agreements would apply. But there the mortgagor was himself the owner of the land, and the plant and materials were to attach to the fee simple as soon as they were brought upon the ground. In this present case there was nothing of that sort, and the assignment being given by the builder over chattels to secure repayment of money, it came within the Bills of Sale Act, and so was void for registration, and, therefore, judgment was given for the execution creditor, with costs. As it stands, this decision may have serious effects upon this common form of arrangement by builders wanting loans.

FRED. WETHERFIELD, Solicitor.

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NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by *Tuesday* morning to insure answer same week.

LEGAL INTELLIGENCE.

SCHOOL BOARD ACTION.—In February last W. H. Lorden and Son, builders and contractors, of Trinity-road, Upper Tooting, S.W., brought an action against the School Board for London for the sum of £460 5s., being the balance of 75 per cent. of an account of £1,413 13s. 4d. (£600 having been previously paid, leaving a total net balance of £813 13s. 4d.) for alterations to a house in Battersea Park-road, in forming new entrance, drainage, &c., to the Latchmere schools, which was, by the consent of the parties, referred to arbitration. The President of the Royal Institute of British Architects, appointed Mr. Charles Barry as arbitrator, who, after nine meetings at the Surveyors' Institute (in which Mr. Pollard appeared for the plaintiffs and Mr. Boyle for the defendants) and one meeting on the site, gave his award on Nov. 29th, as follows:—As to the plaintiffs' claim for £460 5s., being the balance of 75 per cent. of the value of the work done and materials supplied, subsequently, by the consent of the parties, increased to £813 13s. 4d., being the full amount of the balance claimed to be due in respect of said work done and materials supplied. I award and adjudge that the defendants do pay to the plaintiffs the sum of £745. And as

to the defendants' claim for compensation for delay, I further award and adjudge that the defendants have no claim or demand against the plaintiffs with respect thereto. And I further award and adjudge that there are no matters in difference in reference to the said works between the parties other than those with which I have herein before dealt. And I further award and direct that the defendants do pay to the plaintiffs their costs of and incidental to the reference and the costs of the award, and that defendants do bear their own costs of the same.

THE LEGALITY OF MASTER CARVERS TO CHARGE FOR STEAM POWER.—At the Clerkenwell County-court, on Friday, before Judge Eddis, George Saunders, wood carver, Central-street, City-road, sued Frederick Henry Ayres, master wood carver, of 111, Aldersgate-street, E.C., for £1 2s. wages due. Mr. Corry Grant, for plaintiff, said that in September plaintiff was in Mr. Ayres' employment as wood carver. It was the custom of defendant to deduct a certain amount from his men's wages every week for the use of steam power, and for the week ending October 3, 4s. 1d. was deducted from plaintiff's earnings. Plaintiff asked for his full money, 22s., and this demand being refused, the present action was commenced. Counsel had been instructed by the Cabinet Makers' Union, who had taken the matter up, they thinking that the question as to the legal right of masters in charging for steam power should be decided. The present action was a test case, and the Union were prepared to carry the matter, if necessary, to the House of Lords. His contention was that the masters had no right to make deductions from their men's wages, as the Truck Act prohibited any deductions being made unless a special agreement was entered into between the employer on one hand and the employed on the other. Plaintiff was called, and confirmed the opening statement. Cross-examined: He had been in defendant's employment for 18 months. He objected to the deductions because he was charged for steam power in an afternoon he had not worked. He was working on piecework. Re-examined: The best firms in the trade made no deduction for steam-power. For the defence, Mr. Dale contended that his client had not been guilty of any infringement of the Truck Act. James Mansell, defendant's foreman, and defendant's son having stated that plaintiff had not previously objected to the deductions, his Honour adjourned the case in order that he might look into the Acts of Parliament before giving a decision.

THE DISTRICT SURVEYOR AND HIS DEPUTY.—At the Lambeth Police-court, on Friday, Mr. H. A. Brown, a builder, of Herne-hill, was summoned by Mr. J. A. Woodward, district surveyor, for having proceeded with the erection of a building without having given notice, as required by the Building Act. The complainant said he discovered during the previous week that the defendant was erecting a dwelling-house at Herne-hill, without having first given the requisite notice.—Cross-examined: He was appointed to take charge of the Southern Lambeth District on Sept. 27, in consequence of the suspension of Mr. H. Parsons. He had not asked the defendant whether he had given notice to Mr. Parsons. He relied upon the list supplied to him by Mr. Parsons.—Defendant's solicitor called Mr. Henry Parsons, who said he received notice from the defendant, on Aug. 6 last, of his intention to erect some houses at the rear of Kestrel-avenue, Herne-hill. The notice was satisfactory to him as district surveyor. Mr. Woodward contended that, even if that were so, Mr. Brown was not entitled to proceed under a notice given as far back as August. Mr. Hopkins said this was a three-cornered fight between Mr. Parsons, the County Council, and the district surveyor. The summons must be discharged, with one guinea costs.

SERIOUS CHARGES AGAINST A BUILDER AND SOLICITOR.—At the Bow-street Police-court, on Monday, Henry Granville Wright, 50, solicitor, of Ordham Dene, St. Peter's-road, Croydon, and James William Hobbs, 49, managing director of J. W. Hobbs and Co. (Limited), of Norbury Hall, Streatham, were charged with forging and uttering a bill of exchange for £136 8s. 7d. Hobbs was also charged with stealing £29 9s., the moneys of J. W. Hobbs and Co. (Limited). Mr. Sims, for the Treasury, said that the accused were charged with forging and uttering a bill of exchange, and Hobbs was also charged with stealing a sum of money belonging to the Liberator Building Society. The accused had been arrested only on Sunday, and as there had been no time to get the witnesses, he proposed to give formal evidence of arrest, and ask for a remand. Henry Moore, inspector of the Criminal Investigation Department, New Scotland-yard, said he was present at the arrest of Hobbs at Norbury Hall, Streatham, his private residence, at nine o'clock on Sunday evening. Tonbridge read the warrant to him, and Hobbs said: "With respect to the two warrants for forgery I know I am entirely innocent. I have in my time signed hundreds of thousands of bills, many without signature of the drawer." With regard to the warrant for felony, he said: "I have for many

years past never touched a wages sheet, and for a very long time have never paid a penny of the wages myself." Wright, when charged at Bow-street, made no reply. The information on which the warrants had been granted were then read over. That of George Charles Kentish, formerly a cashier in the employ of W. Hobbs and Co., and now engaged in the liquidation of J. W. Hobbs and Co. (Limited), said that the business was turned into a company in 1885, with a capital of a quarter of a million. Before this Hobbs was financed by Wright and by the Liberator Building Society. He was indebted to Wright, and Wright was pressing for payment. It was arranged that he should be paid, and that to do this bills should be drawn and accepted by Hobbs, and presented for payment by Wright. The bills purported to be drawn by firms who supplied goods to Hobbs. They were drawn at one time to the number of eight or ten, representing about £2,400. Deponent was present when the bills were drawn, and knew that the proceeds were to go to Wright. The firm in whose names they were purported to be drawn had nothing to do with them. The names were left in blank when the bills were drawn, and were filled up by deponent with those of firms doing business. These bills were not entered in the ledger, and were not presented at the bank, but were paid by cheque by Hobbs. Wright's arrangement was that he was to have a cheque for them as they fell due. Hobbs was to get the money from the Liberator Building Society. A rough statement was drawn up by Hobbs for the advances to be made by the Liberator Building Society, and a cheque was drawn to meet this. The bills were not presented at the bank; but Wright was paid by a cheque or genuine bills. Hobbs signed these cheques, and they were payable to Wright, and not to the firm with the name on the bill. Wright was the solicitor to the Liberator Building society, and the moving spirit of all the companies. Deponent told Wright he thought it was a curious business. After the bills were all paid, Hobbs's business was turned into a limited liability company, and he was made managing director. It was the custom to draw cheques for the wages at the different jobs, and there were about 30 wages sheets got out every week. The cheques were drawn on an approximate estimate higher than the actual amount required, and that the surplus remaining after the men were paid went to Hobbs. Deponent admitted that he kept back a little for himself. Mr. Bailey discovered this, and spoke to deponent, who told him he was acting by Hobbs's direction. Deponent was transferred to other duties. He had received about £200 on the transaction, at the rate of about £5 per week. The deposition of Mr. Benjamin Bailey was to the effect that he had been secretary to J. W. Hobbs and Co. (Limited). It was Kentish's duty as cashier to check the wages sheets. It came to deponent's knowledge that they were falsified, and he spoke to Kentish, who told him it was done by the order of Hobbs. Deponent told him he must be dreaming, and informed Hobbs, who expressed his horror, and asked if anyone else knew of it. He mentioned another person, who was sent for, and Kentish was transferred. John Charles Watson, clerk to the Official Receiver, in his information, deposed that since the failure of J. W. Hobbs and Co. (Limited) in October last, he had been engaged in making an examination of the books. He found a bill (produced) purporting to be drawn by the firm W. E. Bradford and Co., and accepted by Hobbs, of which there was no trace in the books. He spoke to Kentish, who was assisting, with the result that Kentish gave him three other bills purporting to be signed by other firms, and subsequently made a full statement to the Treasury. Mr. Alfred George Blythe, in his information, said that up to December, 1893, he represented Messrs. George Wright and Co., who had dealings with Hobbs, but that a bill for £197 2s. 5d., purporting to be drawn by that firm, was not drawn by them, neither was there any record of such a transaction in their books. Mr. Vaughan remanded the accused till Friday, declining for the present to take bail, but expressing an opinion that there would be some further evidence required to connect the accused with the bills.

IN RE F. L. LINZELL.—Under the failure of Frank Lincoln Linzell, builder, Archway-road, a summary of the accounts has been issued, the gross liabilities being returned at £19,316, of which £4,497 are unsecured, with an estimated surplus in assets of £1,609. The debtor has been adjudged bankrupt.

IS A URINAL NECESSARILY A NUISANCE?—**GRAHAM V. THE CORPORATION OF NEWCASTLE.**—In the Court of Appeal, on Friday, Lords Justices Lindley, Bowen, and A. L. Smith gave judgment in dismissing the appeal of "Graham and Others v. the Mayor and Corporation of Newcastle-on-Tyne," from proceeding with the erection of a public urinal in Charlotte-square. The case was reported in our issue of July 29 (p. 164 ante), and commented on by Mr. Wetherfield in our issue of Sept. 30 (p. 479). It appeared that, by the original conveyances under which the plaintiffs claimed, each conveyance obtained an agreement by the

corporation that "the garden or open space" in the centre of the square "should for ever thereafter be kept open and unbuilt upon." It was admitted that this open space had not been used as a garden for many years. The plaintiffs moved for an injunction to restrain the corporation from proceeding with the construction of a urinal, on the ground that they constituted a breach of covenant, and that the urinal itself would create a "nuisance." Mr. Justice Kekewich held that the words "open" and "unbuilt upon" in the covenant were practically synonymous terms, and that the proposed building was not such a building as would interfere with the surface being kept open, and his lordship was not satisfied that the urinal would necessarily be a nuisance to the plaintiffs. He accordingly refused the motion. The plaintiffs appealed.—Lord Justice A. L. Smith delivered the judgment of the Court dismissing the appeal. He said that, by the indenture of February, 1886, all the Newcastle Corporation had covenanted to do was to keep the space in front of the houses open in respect of light and air. They were not bound to keep it for a garden. If the place erected was a nuisance, the plaintiffs must seek a remedy other than under the covenant. The appeal was dismissed with costs.

THE LONDON TRAMWAYS ARBITRATION.—An arbitration between the London County Council and the London Street Tramways Company respecting the purchase of four-and-a-quarter miles of the system, of which the lease expired in 1891, and which the Council decided to acquire under the 43rd section of the Tramways Act of 1870, was concluded on Friday before the arbitrator, Sir Frederick Bramwell, who throughout the six days' inquiry was assisted by Mr. Pipson Beale as assessor. It had been decided that rather than go to the courts on a case stated to raise the interpretation of the section in regard to the basis of value, the arbitrator should proceed to award; under a recent decision a case stated by an arbitrator could not be taken further than the Queen's Bench Division. The main difference between the litigants is as to whether the value is to be structural value or based on years' purchase of profits. Evidence was given by Mr. George Hopkins (consulting engineer to the company), Mr. A. Lance (Belfast Tramways), Mr. A. W. White (Portsmouth Tramways), Mr. Vigers (valuer), Mr. Garrod (surveyor), Mr. Lewis H. Isaacs (surveyor to the Holborn District Board of Works), and Mr. Glennie (the secretary of the company); and on behalf of the Council by Mr. A. Young (surveyor in chief), Mr. Herring (Birmingham Tramways), and Mr. J. Fell. The structural value of the four-and-a-quarter miles was given as £23,092, to which additions would have to be made for depots, cars, horses, and harness, which are to be valued by an independent person to be appointed by both parties.

BAD MORTAR.—On November 10, Messrs. Gill Bros., of the Minories, E., builders, appeared at the Thames Police-court in answer to several summonses taken out by Mr. Arthur Crow, district surveyor for Whitechapel, charging them with infringing the Metropolitan Building Act and the by-laws of the London County Council. The defendants are erecting several warehouses in the Minories and Haydon-hill. The district surveyor stated that on October 25 he found the defendants' mortar mill at work, and mortar being made from old brick rubbish without the addition of lime. He complained to the defendants, and served them with statutory notices to amend the irregular work. On October 28, he took a sample of the mortar in use on the building, which he submitted for analysis to Mr. W. C. Young, F.I.C., F.C.S., public analyst for Whitechapel, who gave evidence that the sample in question contained but 8 per cent. of free lime. At this point, upon a question as to the date of the offence being raised by defendants' counsel, the cases were adjourned. At the adjourned hearing on the 8th instant, the defendants, through their counsel, pleaded guilty to the offence, and Mr. Dickinson imposed fines amounting to £4 2s., and costs £2 6s., observing at the same time that these fines were to be taken as a "warning." Mr. F. W. Gill, who was summoned for a like offence in building the Horse and Leaping Bar, Whitechapel High-street, and who also pleaded guilty, was fined £2, and £2 2s. costs.

IN RE H. TOTEN, SONS, AND YOUNG.—The debtors, William Henry Toten, Thomas Toten, and Frank Broadfoot Young, against whom a receiving order was made on August 2 last, applied on Tuesday for an order of discharge. They had traded as builders in Gloucester-road, Kensington, and also in Fulham-road, under the style of H. Toten, Sons, and Young, and their liabilities were returned in the joint statement of affairs at £4,028; but proofs had been made by creditors for sums amounting to £4,768, and the Official Receiver certified that a dividend of 3s. in the pound had been paid. William H. Toten and Thomas Toten commenced business as builders in 1878 under the style of "Toten Brothers." About two years later their father joined them, and the name of the firm was changed to "H. Toten and Sons." Mr. H. Toten

died in 1887, and the business was continued by the two brothers under the same style until May, 1891, when they sought a partner. A balance-sheet of the firm was prepared, which showed a surplus of £5,488. On the faith of this balance-sheet the debtor Young, in May, 1891, joined the firm, bringing in a cash capital of £1,462, and the business was thenceforth continued under the style of "H. Toten, Sons, and Young" down to the date of the receiving order. It appeared to be now conceded that the balance-sheet in question was inaccurate, inasmuch as Thomas Toten had contracted in the name of the firm of H. Toten and Sons, a large debt which was not taken into account or disclosed in the balance-sheet or the books of the firm. The debtors agreed in attributing their insolvency to heavy losses on contracts occasioned by the strike of carpenters in 1891, and to losses by bad debts. W. H. Toten and Young alleged as further causes of the failure the liabilities contracted in the name of the firm without their knowledge, and the fact that moneys of the firm had been used by Thomas Toten without their sanction. The application was opposed by the Assistant Official Receiver on the ground of the insufficiency of the assets, and also of the book-keeping. He further submitted that Thomas Toten had continued to trade after knowing himself to be insolvent, and that he had also been guilty of gross misconduct amounting to fraud against his partners and against the creditors of the firm of Toten, Sons, and Young. Mr. Registrar Hope, in giving judgment, said he would grant an order of discharge to the debtors W. H. Toten and Young. With regard to T. Toten, he could not come to any other decision than that he had not only committed a fraud on his partners, but also on the creditors. Under all the circumstances he must refuse his discharge.

IN RE G. F. BENNETT, OF BIRMINGHAM.—A meeting of the creditors of George Frederick Bennett, builder and contractor, Bissell-street, Birmingham, was held on Friday. The gross liabilities are scheduled at £9,469 8s. 2d., of which a sum of £2,278 4s. 3d. is expected to rank. The net assets are £586 4s. 9d., leaving a deficiency of £1,691 19s. 6d. The Official Receiver observes that the debtor is the son of W. T. Bennett, who formerly traded as a builder at the same premises, 58, Bissell-street, and filed his petition on the 28th November, 1885, with liabilities amounting to £3,373 10s. 3d., and assets £476 4s. 3d. A dividend of 1d. per pound was paid. He applied for his discharge on the 6th May, 1886, when an order was made suspending it for seven years, which period expires on the 6th May, 1893. The debtor commenced trading immediately after his father's failure, having previously been engaged with him in the business. The insolvency is attributed to "loss on properties, losses in connection with the strike, and illness." The debtor was adjudicated bankrupt, and the public examination fixed for December 21.

IN RE J. B. LIVINGSTON, OF SCARBOROUGH.—The first meeting of the creditors of John Bishop Livingston, of No. 42, Aberdeen-walk, Scarborough, builder and contractor, was held on the 8th inst. The debtor's statement of affairs showed that his gross liabilities were £57,191 13s. 4d., of which £56,700 was secured, the estimated value of securities showing a surplus of £89 0s. 10d.; the unsecured debts were £483 0s. 6d. The assets were £760 4s. 10d., showing a surplus of £227. The Official Receiver said that the debtor had been a builder in Scarborough for 28 years. He commenced with £30. Apart from his building speculations the debtor considered that he was perfectly solvent. In November he was served with writs by mortgagees, and not being able to meet their claims, he filed his petition. The assets, in his opinion, were not over-estimated. The Official Receiver said the creditors would agree with him that the debtor's position was due entirely to his misfortunes, and not to rash trading. Several creditors concurred. The debtor was adjudicated a bankrupt.

The Building Committee of the Stamford Union met on Monday, and in the face of the large minority—18 to 19—which, at the meeting of the board on November 28, pronounced against the building of a new workhouse, decided to take no further steps in the matter, and to resign their appointment.

A Local Government Board inquiry into the application of the Southport Corporation to borrow £28,000 for works of electric supply was held on Monday at the Town Hall, Southport, by Colonel J. O. Hasted, R.E. The electrical engineer (Mr. G. Wilkinson), the gas engineer (Mr. J. Booth), and the borough engineer (Mr. W. Crabtree) were present. The works are to immediately provide for 1,900 lamps of 16c.p., and to be capable of supplying 6,600 such lamps. Street-lighting is not at present contemplated. The chief demand for some time will arise in the lighting of hotels, hospitals, shops, and private residences. No opposition was shown.

WATER SUPPLY AND SANITARY MATTERS.

LEIGHTON BUZZARD WATER SUPPLY.—An artesian-bored tube well, 144ft. in depth, has recently been drilled through the gault into the lower greensand formation, tapping powerful springs yielding a minimum supply of 290,000 gallons per day without materially affecting the head of water. Professor Atfield and Dr. Muter report the water as most remarkably pure. Messrs. C. Isler and Co., London, were the contractors.

ECCLESFIELD, NEAR SHEFFIELD.—A Local Government inquiry was held on Thursday at Greenside Workhouse, Sheffield, by Major-General Phipps Carey, R.E., one of the engineering inspectors of the Local Government Board, as to a scheme of main sewerage and sewage disposal for the town of Ecclesfield, for the Wortley Union rural sanitary authority. The scheme comprises main sewer pipes 18, 15, 12, and 9 inches in diameter, with complete ventilating and flushing arrangements, together with large tanks in duplicate, where the sewage will be thoroughly treated with Messrs. P. Spence and Son's aluminio-ferrie, which is suspended in a cage or iron basket immersed in the sewage to admit of the proper quantity being dissolved to effect precipitation. The clarified sewage is then passed on to land to be purchased from the Duke of Norfolk, laid out for intermittent filtration, with special under-drainage and ventilation; which, with regular and systematic management, will pass the effluent in a colourless and inodorous state into the adjoining stream. Mr. D. Balfour, M.Inst. C.E., F.G.S., of Newcastle-on-Tyne, explained the disposal scheme, and after hearing the evidence of others present (there being no opposition), the inspector visited the site, and will report in due course to the Local Government Board on the whole scheme, which is estimated to cost £7,000.

CHIPS.

Mr. Charles Henry Luard, Royal Engineers, one of the Local Government Board Inspectors, held an inquiry on Monday at the Town Hall, Sunderland, into applications by the Sunderland Town Council for leave to borrow £20,226 for the purchase of a site for a new lunatic asylum, for works of street-improvement, for laying out of the Roker Park Extension, and for alterations to the Borough Police-court buildings.

Mr. John Faed, R.S.A., the brother of Mr. Thomas Faed, R.A., has just presented to his native town of Kirkcudbright an interesting collection of paintings, mostly of a domestic kind, on condition that the town council provide a gallery for their exhibition. Mr. Faed is the son of an engineer, and exhibited his first works in Edinburgh over 40 years ago. He has lived in London for the last 30 years.

It is explained that the dissolution of partnership between J. Stiff, W. Stiff, and E. Stiff, trading under the name of James Stiff and Sons, London Pottery, Lambeth, S.E., announced on Saturday, is simply the formal notice of the retirement of Mr. James Stiff, which occurred in the year 1876, in accordance with the provisions of the partnership deed. The business has been, and will be, carried on under the same style by the two remaining partners, who have had the entire management for the last 20 years.

The premises of Mr. James A. Gordon, builder and contractor, of Newtownards, near Belfast, were totally destroyed by fire on Friday last. The loss is estimated at £1,300.

Mr. Philip D. Armour, of Chicago, has given £300,000 sterling to Chicago to found an Armour institute of science and art, modelled on the Drexel Institute at Philadelphia. The new buildings for the institute, which are situated in Armour-avenue, Chicago, are approaching completion.

A new school chapel, erected by the Independent Methodists in Bridgefields-street, Bury, Lancs., was opened on Wednesday week. The schoolroom is 48ft. 6in. by 32ft., exclusive of three classrooms, the largest of which is 22ft. by 9ft. 6in. In design the building is of the English Renaissance; it provides accommodation for over 600 scholars, and the cost, including furnishing and heating apparatus, is about £1,000. The work has been carried out from designs by Mr. J. L. Crumpleholme, architect, of Nelson and Bolton.

Reopening services in connection with the restoration of the Bourn Abbey Church were held last week. The restoration has been effected at a cost of £1,400. Mr. Traylen, Stamford, and Mr. Shilcock, Bourn, were the architects, and Mr. Roberts, Stamford, the contractor.

At the Walsall Police-court last week Joseph Ford, a local builder, was fined 30s. and costs in two cases—first, for omitting to provide damp-courses in nine double-fronted villas, and, secondly, for neglecting to deposit plans before commencing operations.

Our Office Table.

MR. ALFRED GILBERT, A.R.A., who has been advanced to the rank of Academician, in the stead of the late Mr. Thomas Woolner, is only thirty-eight years of age, and is the sculptor of the Jubilee Memorial of the Queen at Winchester, and of the Memorial to Earl Shaftesbury, now in course of erection in Piccadilly-circus. His monument of Professor Fawcett is in Westminster Abbey. He has in hand a new silver medal for the Architectural Association, and a bust of the late Duke of Clarence for the Queen. We gave his portrait and a biographical sketch on the same sheet with that of Mr. Woolner, his predecessor, in the BUILDING NEWS for May 30, 1890.

"REMBRANDT" was the subject of a lecture given at the Corporation Art Galleries, Glasgow, on Saturday evening, by Dr. J. Forbes White, of London. Lord Provost Bell presided, and there was a crowded attendance. The lecturer remarked that a successful artist must work with his hand, head, and heart—i.e., with technical skill, intellect, and deep sentiment. Rembrandt possessed all three in an eminent degree, but more especially the former and the latter, for his colour and form were sometimes disputed. Like Sir Walter Scott, he spent the latter part of his life in circumstances of pecuniary difficulty; but, unlike the Wizard of the North, the productions of Rembrandt's straitened days were his greatest. One very strong characteristic which Rembrandt impressed upon those who studied his pictures was that, although he frequently treated the same subject, his individuality and imaginative power were so intense that he never dealt with it twice from the same point of view nor in the same manner. Rembrandt brought etching to perfection—no advance had been made in that branch of art since his time. Dr. Forbes White congratulated the people of Glasgow on their possessing some good specimens of Rembrandt's skill.

A new theatre of some originality of plan has been erected in Brussels from the design of Mr. Jean Baes, of that city, and a folio volume, in illustration of the work, has just been issued by Mr. Lyon Claessen, under the title "Théâtre Flamand à Bruxelles." The main idea embodied in the arrangements for the safety of the public is the construction of external galleries or balconies on either side of the building at its several levels. The floors are of fireproof construction, and the theatre, being erected on an isolated site, has streets on all four sides. A very ample vestibule opens on to the grand staircases leading right and left, and over the entrance is a spacious refreshment saloon. Considerable space is devoted to a promenade at the rear of the boxes, and external to the auditorium. Several staircases reaching the various levels are placed along the flanks of the building, and to the rear are the artists' dressing-rooms. The building is sumptuously decorated.

AMONG the railway schemes to be brought before Parliament next session is the proposal for a Clapham Junction and Paddington subway, a revival on improved lines of a project brought forward in 1891. The proposal then failed, as it proposed to tunnel under Kensington Gardens a short distance below the surface; but the present scheme is for a subway 70ft. below the surface of the gardens. The fears of our correspondent, "Goth," that the quietude and beauty of the gardens would be spoiled by the line does not therefore seem to be justified by the facts. The route adopted is almost directly north and south, and a little over four miles in length. Beginning on the west side of Paddington Station, the first station is in Uxbridge-road, and the line is then carried by the side of the Serpentine in a straight line under Kensington Gardens to near the Albert Hall where there is a station, and then beneath Exhibition-road to South Kensington Station, and thence southwards beneath Sidney-place, and Manor-street, Chelsea, with stations in the Fulham-road, King's-road, and the Embankment. Burrowing beneath the Thames east of the Albert Suspension Bridge, the line passes on the west side of Battersea Park to Clapham Junction. The eight intermediate stations are conveniently placed, and the line, if sanctioned and constructed, would prove a useful and direct means of communication between the chief western and southern termini.

A REMARKABLE example of electrical transmission has been completed in Rome. The generating station is at Tivoli, 18 miles distant. Six turbines of 330 H.P. and three of 50 H.P. each are employed. The dynamos, of which there are three, each furnish a current of 42 amperes at a potential of 5,100 volts. These are connected "in parallel" to the line of four copper cables carried overhead upon oil insulators or iron poles. The current is said to reach Rome at a potential of 4,000 volts, reduced to 2,000 volts, and the total energy transmitted is stated to be 1,200 H.P. Apropos of electrical power, it is stated that the Columbian Exhibition will be lighted by 300,000 incandescent lamps.

THE Lord Mayor, as Master, and the Wardens and Court of the Plumbers' Company entertained at the Mansion House, on Wednesday evening, a numerous company. Sir W. Foster, M.P., Parliamentary Secretary to the Local Government Board, replied to the toast of "The Houses of Parliament," and congratulated the Plumbers' Company on having taken the lead in introducing a legislative measure the object of which was to improve the existing system of preserving the public health. That Bill, which had already been put before the House of Commons, was an exemplification of the wise action of the Plumbers' Company. The other toasts were: "The Public Health," proposed by Sir Joseph Savory, and responded to by Mr. T. Bryant, P.R.C.S.E.; "The Municipal Corporations of Great Britain and Ireland," proposed by the Lord Mayor, and responded to by the Lord Mayor of Dublin; "The Progress of Education," proposed by the Rev. Dr. Wace, and responded to by Capt. W. de W. Abney, C.B.; "The County Councils of the Kingdom," proposed by the Mayor of Birmingham, and responded to by Mr. E. Bayley; and "The Lord Mayor," proposed by Sir J. Crichton Browne, and responded to by his lordship.

THE annual meeting of the North of England district for the registration of plumbers will be held at the Literary and Philosophical Institute, Newcastle-on-Tyne, on Tuesday next. The mayor will preside, and Principal Garnett will give an address on "The Craft of Plumbing." The report of the council, which will be presented at the meeting, indicates that during the past year there has been a satisfactory amount of activity in two or three important branches of the work, more particularly as regards technical education. As a result of the special classes held at the Durham College of Science for the purpose of training a few selected men, classes have been established under the auspices of the Durham and Northumberland County Councils at several local centres. During the year 45 applications for registration have been considered, of which number ten master plumbers and nine journeymen were nominated for registration, the remainder being held over for further evidences of efficiency by examination. Several recommendations for the reorganisation of the district are made in the report, one proposal being that strong local committees should be formed at the large centres in the North of England district, each of which would appoint delegates to serve upon the Central Council in Newcastle.

AN Intercolonial Conference of Australasian surveyors has been held during October at the Custom House, Melbourne. The colonies represented were New South Wales, Victoria, Queensland, South Australia, Western Australia, and New Zealand. Mr. R. L. J. Ellery was elected chairman. A resolution affirming the desirability of a uniform system of examination for surveyors was carried, and the details of the scheme were discussed and agreed upon. In the evening of the first day's conference the members of the conference were entertained at dinner at the Freemasons' Hall, by the Victorian Institute of Surveyors. About 60 gentlemen were present, and the chair was taken by Mr. T. W. Fowler, President of the Institute. The toast of "The Representatives of the Other Colonies" was given by Mr. Stuart Murray and responded to by Mr. G. W. Goyder, of South Australia; Mr. A. C. Gregory, the veteran explorer and now Surveyor-General of Queensland; Mr. E. Twynam, New South Wales; and Mr. J. S. Brookling, Western Australia. "Success to the Conference" was proposed by Professor Kernot, and Mr. J. M. Coane gave the toast of "Our Visitors."

AN experiment in street-paving is about to be made in Glasgow with vitrified bricks in place of

the stone and wood hitherto used in this country for such purposes. Brick paving is common in some Continental towns, but the difficulty of procuring the right kind of material for the manufacture of bricks in this country of a sufficient hardness and toughness, has prevented that form of paving being fully tried for roadway purposes. The present experiments are to be made with an intractable material found on the estate of Lee, near Brandwood, and the bricks are to be manufactured by the Omoa Fireclay Company, who are erecting new works for the purpose. Whilst the material is called a clay, it is in reality an imperfect hematite ore, and requires to be quarried. A part of Buchanan-street, above Sauchiehall-street, leading to Buchanan-street Station, where the traffic is very heavy, is to be laid with the bricks, and also a part of Gordon-street, where the traffic is lighter. It is claimed for the brick blocks that they are durable, clean, healthful, easy to repair, and comparatively noiseless, while they are expected to be cheaper than either granite or wood paving.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. "The Hypethral Temple," by Dr. William Dorfield, F.S.A., of Athens. 8 p.m.
Surveyors' Institution. 8 p.m.
Leeds and Yorkshire Architectural Society. Social evening. 8 p.m.
Surveyors' Institution. "Ventilation," by E. Tidman, F.S.I., M.S.A. 8 p.m.
TUESDAY.—Institution of Civil Engineers. Discussion on "The Manufacture of Small Arms." 8 p.m.

CHIPS.

The District of Shoreditch and the Liberty of Norton Folgate has been conferred on Mr. Henry Lovegrove, district surveyor of South Islington. It is a curious fact that the amalgamated district contains three vestry halls.

The new saloon of the Tyne Theatre, which has been designed and carried out under the supervision of Messrs. Oliver and Leeson, architects, of Newcastle-on-Tyne, has been opened this week. The work has been done by Mr. G. H. Moor, contractor; the electric lighting by R. J. Charleton, and the decoration by Messrs. Richardson and Son.

The Carlisle Town Council unanimously agreed on Tuesday to open out Lower-street to Eden Bridge, at a cost of about £10,000.

It has been proposed to erect a technical instruction school in Stamford. The site suggested is on the north side of the Shambles. Plans have already been prepared by Mr. Trayen, of Stamford. The building would have a frontage to Broad-street, and would comprise an upper room about 50ft. by 18ft. with movable partitions, and lighted to the north; while below there would be two rooms.

A new block of public washhouses, erected by the Edinburgh Corporation in South Gray's Close, High-street, were opened on Friday. They cost £3,450, and contain 26 washing-tubs, boilers, and drying-horses, a rotary wringer, and a suite of bathrooms.

The Leeds Art Gallery has received three additions of note during the past week. The original drawing of the town hall by Brodhill, its architect, has been purchased; a view of Cyffing Falls, Capel Curig, by John Peel, has been presented to the gallery, also the original etching of Kirkstall Abbey, executed by Axel Haig.

Mr. Percy E. Newberry, with a staff, consisting of Mr. Percy Buckman (artist), Mr. John E. Newberry (architect), and Mr. Howard Carter (draughtsman), left England this week for Upper Egypt to carry on the archaeological survey, under the auspices of the Egypt Exploration Fund. The capital of Tel-el-Amarna will be the main seat of operations for the season.

A new Roman Catholic church is in course of erection at Milltown, co. Kerry. It is Early English in style, will consist of nave, transept, chancel, and bell tower and spire. Mr. Daniel O'Connell, of Derrynane, is the architect, and the outlay will be £4,000.

The Goldsmiths' Company have offered to add £25,000 to the funds now being administered by the Guinness Trustees for the provision of dwellings for the poorer class of workmen, the chief conditions being that the sum shall be appropriated towards the cost of the block of buildings now approaching completion in Lever-street.

The Rev. S. O. Baker, of Much Elney, has restored to the Scottish regalia collection at Edinburgh the belt belonging to the sword of State for Scotland, given to James V. by Pope Julius II., and which had long been in private hands.

The Borough Surveyor of Widnes, Mr. John S. Sinclair, has been elected an associate member of the Institute of Civil Engineers.

Trade News.

WAGES MOVEMENTS.

KINGSTON-ON-THAMES.—Some time ago the master builders of Kingston-on-Thames intimated their willingness to concede the increased rate of wages—viz., 9½d. per hour—paid to bricklayers in the London district, and a strike was consequently averted. On Friday, however, it was announced that the Master Builders' Association, which has been formed since that time, intend to ignore the London rate, and pay only 9d. per hour. As a consequence, all bricklayers affected by the reduction have been called out.

AMALGAMATED SOCIETY OF CARPENTERS AND JOINERS.—Mr. F. Chandler, the general secretary, in this monthly report to the members of this society, reports that 41 new branches have been opened during the year, and that the recorded increase of members is over 2,000. New branches have just been formed at Brixton, Forest Gate, Aulsebrook, Marple, and Balth, besides two fresh ones in the United States.

CHIPS.

Worthing has declared in favour of the Public Libraries Act. A poll of the burgesses shows a majority of 739 in favour of its adoption.

At Monday's meeting of the Town Council of Harrogate a long discussion arose in reference to the new Montpelier Baths, and it was resolved that a special meeting be held to reconsider the question, with a view of modifying the scheme, and, if possible, selecting a different site for the baths.

A stained-glass window, the work of M. A. O. Hemming, of Margaret-street, W., was unveiled in the north aisle of Thornbury parish church last week. It contains four illustrations of the parable of the Good Samaritan.

Through the munificence of the new Dean of St. Asaph, that village-cathedral-city will shortly be presented with an ecclesiastical library and museum. The site selected and purchased is situated between the grammar school and the cathedral, and the erection of the structure proposed will proceed at once, contracts having been entered into.

The foundation-stone of a new church has been laid in Poynton Fen, near Billingborough, in the Fen district. The total cost of the building, including the internal fittings, will be about £300. It will be built of brick, from the designs of Mr. A. C. Wood, architect, Grantham, and the contract has been let to Messrs. Wadsley and Son, of Horbling.

The old market hall at Kendal has been refitted as a public library and newsroom at a cost of £2,500, raised by subscription. The reopening took place on Friday.

The Memorial Hospital, Mirfield, is now nearing completion. It is being warmed and ventilated throughout by Mr. E. H. Shorland, of Manchester. The large wards are warmed by means of Shorland's patent Manchester stoves with descending smoke flues, and the smaller wards by means of the patent Manchester grates. For the extraction of the vitiated air, Shorland's patent exhaust roof ventilators are used throughout the building.

In the application for discharge from bankruptcy made by Alexander Dorman, of Gunter-grove, Chelsea, builder and decorator, the discharge has been suspended for two years ending November 3, 1894.

The rebuilding of St. Mary Abbot's mission-hall and infant school, Kensington, for the Hon. the Rev. E. Carr Glynn, M.A., will shortly be undertaken. The infant school will be built according to the requirements of the Education Department, and the plans have been approved. The architect is Mr. T. Phillips Figgis, A.R.I.B.A.

Messrs. Potts and Sons, clock manufacturers, of Cookridge-street and Guildford-street, Leeds, have been chosen to supply the clock at Copt Hewick, near Ripon.

The sale of the first portion of Millbank Prison realised on Tuesday the small sum of £630. The buildings sold originally cost about £10,000 in materials alone.

The foundation stone of sub-central co-operative stores in High-street, Lincoln, were laid last week. The premises will be three floors in height, and will cover an area of 65ft. by 60ft. The chief elevation is Renaissance in character, and will be of stone. The cost will be about £5,000. The contractors are Messrs. Wright and Sons, the clerk of the works for the brickwork is Mr. C. Robinson, and for the woodwork Mr. Panton, the society's foreman joiner. The whole of the work has been designed by, and will be carried out under the supervision of, Mr. J. H. Cooper, architect, of Lincoln.

Mr. Gladstone's portrait, by John Macdure Hamilton, which was a feature of the Academy Exhibition of 1891, now figures in the Luxembourg Gallery, where the permanent exhibition of works by living artists has been reopened. Another of Mr. Gladstone's recent portraits, that by J. Colin Forbes, R.C.A., was presented on Monday to the National Liberal Club by Earl Rosebery, as the spokesman of the Liberals of Canada.

New board schools were opened on Tuesday week at Swatters Car, Middlesbrough. The schools have been built to accommodate 1,265 children at a cost of £10,000.

In our notice last week of the vacant curatorship at the Soane Museum, the late Mr. Wilde's Christian name was, by a printer's error, given as Joseph instead of James. The average number of visitors to the museum for the past three years has been over 3,300 during the six months it is open, in addition to 300 admitted by ticket during the remaining six months of each year.

A fragment of archaic Greek sculpture, dating c. 600 B.C., in white marble and of life size, of a man's head, has been presented to the British Museum by Mr. Webb, of Milford, West Surrey. It is perfect, except the nose, which has been broken away; and the chin has been repaired by some modern hand.

The names of Mr. John Anderson, slate merchant, Macduff, and James Christie, house carpenter, Banff, have been added to the commission of the peace for Banffshire.

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TENDERS.

* * Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

BERMONDSEY, S.E.—For the provision of a covered playground for the infants' department at Monnow-road school, Bermondsey, for the London School Board:—
Marsland, J. ... £198 0 0
Tyerman, J., Walworth (accepted) 190 0 0

BRISTOL.—For the supply of fittings for the stables and sheds now in course of erection in Clement-street and in St. Philip's Marsh, for the city council:—
Bristol Waggon Co. (accepted) ... £495 0 0
(Lowest tender received.)

BRISTOL.—For the erection of lavatories on Durdham Down, for the city council:—
Galbraith (accepted) ... £1,242 10 0

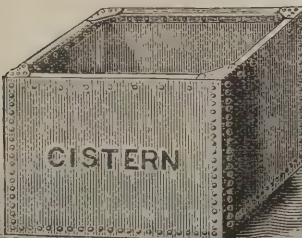
BRISTOL.—For the construction and erection of condenser, pumps, steam, and other pipes, for the electrical committee of the City Council:—
Allen, W. H., and Co. (accepted) £4,201 0 0
[In lieu of one from Woodhouse and Rawson, accepted in August last, and since withdrawn.]

BRISTOL.—For the removal of sheds adjoining the site of St. Augustine's Bridge, for the city council:—
Krauss, A., Bristol (accepted).

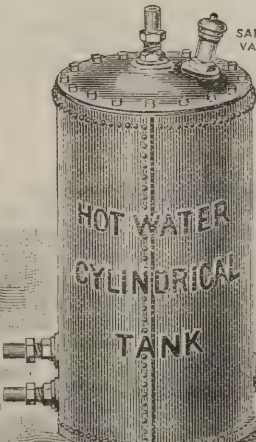
COLCHESTER.—For erection of stables, loft, &c., and house, Maidenburgh-street, for Mr. Douglas Round. Mr. J. W. Start, F.S.I., Colchester, architect:—

Ward, T. J., Colchester	...	£915 0 0
Beaumont, R., Colchester	...	82 0 0
Chambers, W. A., Colchester	...	812 0 0
Dupont, E., Colchester	...	776 0 0
Diss, A., Colchester (accepted)	...	750 0 0

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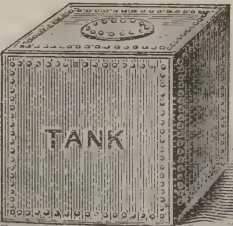


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CLAPHAM, S.W.—For refitting the w.c.s. and for improving the drains, and for inclosing additional land, at Wirttemberg-street School, Clapham road, for the London School Board:—

Lathey, Bros.	£1,131	0	0
Smith and Sons	1,091	0	0
Hammond, W.	1,059	0	0
Parsons, E.	1,050	0	0
Mallett, H.	1,048	0	0
Whitehead and Co.	993	0	0
Tyerman, J.	925	0	0
Garrett and Son	910	0	0
Triggs, E., The Chase, Clapham*	797	0	0

* Accepted.

CLAYBURY, ESSEX.—For the electric lighting of Claybury Asylum, for the London County Council:—

Bourne and Grant	£14,400	0	0
Andrews, J. D. F., and Co.	12,593	0	0
Fowler, Lancaster, and Co.	11,781	0	0
Binko, H., and Co.	10,999	0	0
Electrical Supplies, &c., Co., Ltd.	10,930	0	0
Dawson, R.	9,887	0	0
Mather and Platt, Limited	9,118	0	0
Cox and Walkers	8,920	0	0
Bannett, R. H., and Co.	8,214	0	0
Seere, H. F.	8,176	0	0
Brush Electrical Engineering Co., Limited	7,814	0	0
Edmondson's, Limited	7,680	0	0
Latimer, Clark, and Co., Limited.	7,477	0	0
Mann, E.	6,491	0	0
New and Mayne	6,278	0	0
Appleton, Burbey, & Williamson	6,074	0	0

CLIFTON, BRISTOL.—For a new parish-room near the lift railway from Hotwells to Clifton Downs. Messrs. Munro and Sons and Croydon Marks, architects:—
Hayes, C. A. (accepted).

CLIFTON, BRISTOL.—For the supply and erection of electric signals, in connection with the Clifton Rocks Railway:—
King, Mendham, & Co., Bristol & London (accepted).

DARLSTON.—For the erection of new board schools at the Green:—
Lees, W. T., Darlston (accepted) £4,353 0 0

EAST GRINSTEAD.—For the erection of new premises at East Grinstead, Sussex, for the Capital and Counties Bank. Messrs. J. D. and H. E. Mathews, 11, Dowgate-hill, London, E.C., and East Grinstead, architects:—
Colls and Son, Dorking £3,340 0 0
Rice, East Grinstead 3,210 15 10
Carriek, Redhill 3,150 0 0
Tooth, East Grinstead (accepted) 2,800 0 0

FOLKESTONE.—For repairing the disinfecting chamber at the Sanatorium, for the town council:—
Fraser and Co., Commercial road, E. (accepted) £33 10 0

HEYWOOD, LANCOS.—For sewerage Hampden, Buckley, and Wild streets, for the town council. Mr. James Diggle, borough surveyor:—
Turner, Thos. (accepted).

HOLBORN, E.C.—For the erection of an underground convenience at Holborn, for the City Commissioners of Sewers:—
Mowlem and Co. (accepted) ... £2,921 0 0

ISLINGTON, N.—For providing and fixing heating apparatus on the low-pressure hot water system, with boiler, for the enlargement of the Canonbury-road School, Islington, now in course of erection, for the London School Board:—

Ellis, J. C. and J. S.	£591	0	0
Davis G.	400	0	0
Cannon, W. G.	390	0	0
Pearson, R. H. and J.	393	0	0
Purcell and Nobbs	333	0	0
Maguire and Sons, Dawson-street, Dublin (accepted)	316	0	0

LIVERPOOL.—For the erection of two hospitals on the upper land at Parkhill, for the city council:—
Morrison and Sons (accepted) ... £3,639 0 0

LONDON.—For alterations to the Tiger beer house, Walworth-road, S.E., for Mr. Bigoll. Mr. W. M. Brutton, 171, Queen Victoria-street, E.C., architect:—
Pritchard and Renwick £128 0 0
Crook, B., Brixton 125 0 0
Babbs, H., Walworth (accepted) 97 0 0

LONDON.—For rebuilding 3, St. Martin's-street, Leicester-square, W.C., for Mr. Israel Britten. Mr. W. M. Brutton, 171, Queen Victoria-street, E.C., architect:—
Johnson and Manners, Soho £1,749 0 0
Feast, J. and J., Soho 1,534 0 0
Smith, W., Kennington 1,300 0 0
Whitehead, L. and Co., Clapham 1,275 0 0
Edwards & Medway, Kennington 1,267 0 0
Rowe, W., Clapham 1,195 0 0
Pritchard & Renwick, Southwark 1,174 0 0
Tout, A. H., Kentish Town 1,165 0 0
Archer, G. S., Finsbury (accepted) 995 0 0

LONDON.—For the supply of one and a half million wire cut building bricks and quarter-million facing bricks for the London and South Western Railway Company:—
Blanchard, M. H., and Co., Bishop's Waltham (accepted)

LONDON, E.C.—For the rebuilding of Nos. 8 and 9, Great St. Helen's, E.C. Mr. Delasia Joseph, F.R.I.B.A., 17 and 18, Basinghall-street, E.C., architect:—
Bywaters and Sons £10,750 0 0

LONDON.—For rebuilding the Crystal P.H., Rotherhithe New-road, exclusive of fittings, and dwelling-house adjoining 57, Old-road, Bermondsey, S.E., for Mr. George Evans. Mr. W. M. Brutton, 171, Queen Victoria-street, E.C., architect:—

	A.	B.
Burman, H., and Sons, Kennington ...	£3,764	£3,474
Smith, W., Kennington	3,155	3,081
Hart, Bros., Southwark	3,093	2,939
Pritchard and Renwick, Southwark ...	3,078	2,953
Rowe, W., Clapham	3,050	2,780
Gadson, G., and Sons, Kilburn	2,973	—
Whitehead, L. and Co., Clapham ...	2,940	2,852
Allen, J., and Sons, Kilburn	2,837	2,687
Holloway, H. L., Deptford	2,788	2,696
Edwards and Medway, Kennington ...	2,786	2,600
Archer, G. S., Finsbury	2,650	2,515
A.—Portland stone. B.—Bath stone.		

MANCHESTER.—For the erection of Temperance Hotel, Deansgate, Manchester, for the Manchester Temperance Hotels Co., Limited. Messrs. Moffat and Bentley, Whitehaven and Manchester, architects. Quantities by Messrs. W. J. Watts and Son, Manchester:—

Byrom, J., Bury, Lancashire	£21,151	0	0
Young, Tinker, and Young	20,613	0	0
Bullivant and Son	21,500	0	0
Whitell, R.	20,332	0	0
Thorpe, W.	20,250	0	0
Brown, W., and Son	19,831	0	0
Wilson and Toft	19,193	0	0
Southern, W., and Son	18,710	0	0
Megarthy, S., and Co.	18,650	0	0
Burgess and Galt	18,340	0	0
Neill, R., and Sons	18,290	0	0
Lister, McCartney, and Lister* ...	18,974	0	0

Rest of Manchester.
* Accepted, subject to reduction.

MILLWALL, E.—For erecting a covered playground for the boys' department of the British-street School, Millwall, for the London School Board:—
Gibb and Co., West India-road, E. (accepted) ... £147
[In lieu of tender for £74 from W. Neil, of Turner's-road, E., previously accepted, and withdrawn on account of error of £100.]

MILLWALL, E.—For improving the ventilation and lighting of boys' classroom G in the British-street School, Millwall, for the London School Board:—

Robey, J. T.	£57	0	0
Gibb and Co.	53	10	0
Holding and Son	48	0	0
White, F., and Son	47	0	0
Vigor and Co., King-street, Poplar* ...	46	10	0

* Accepted.

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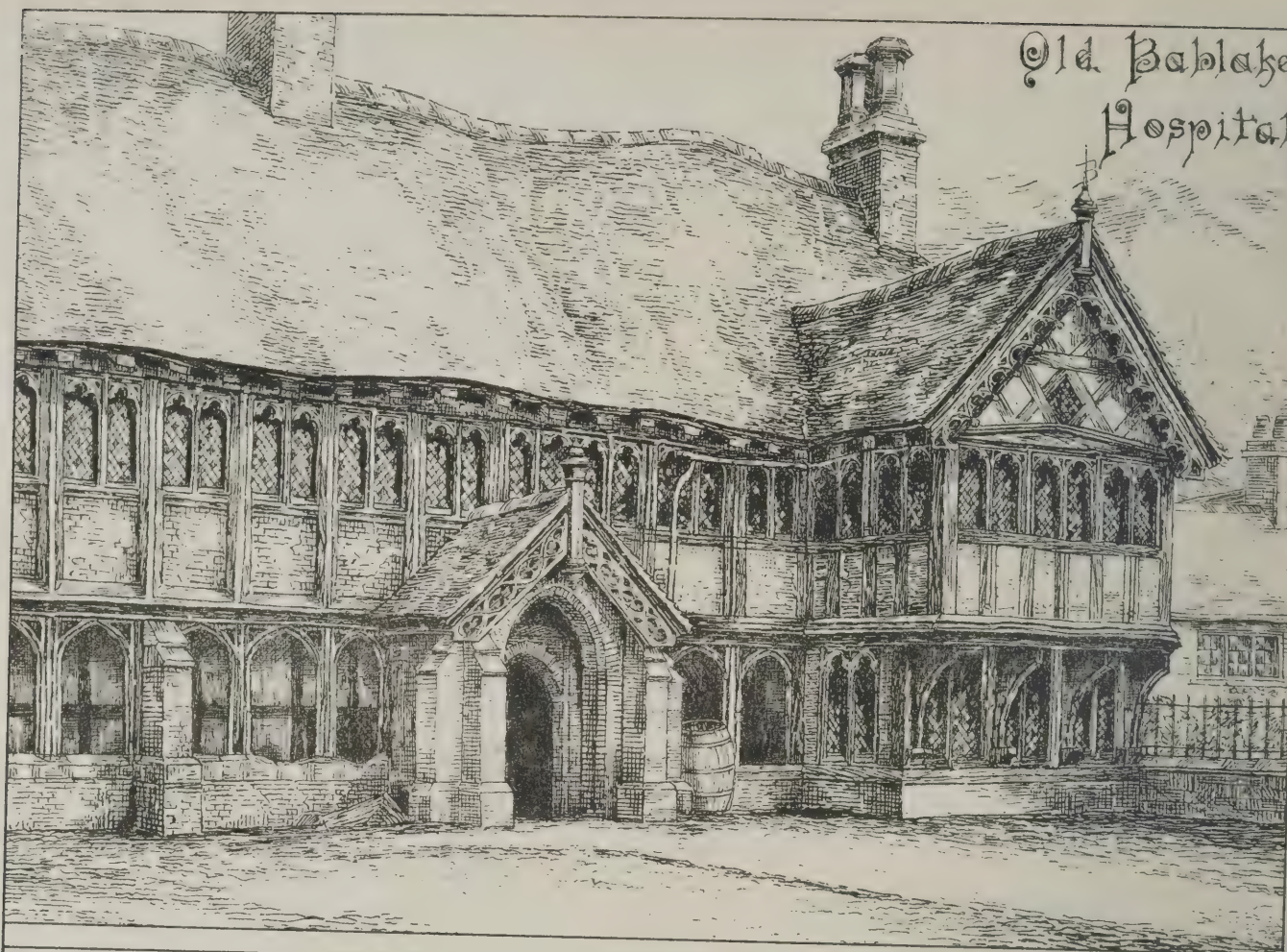
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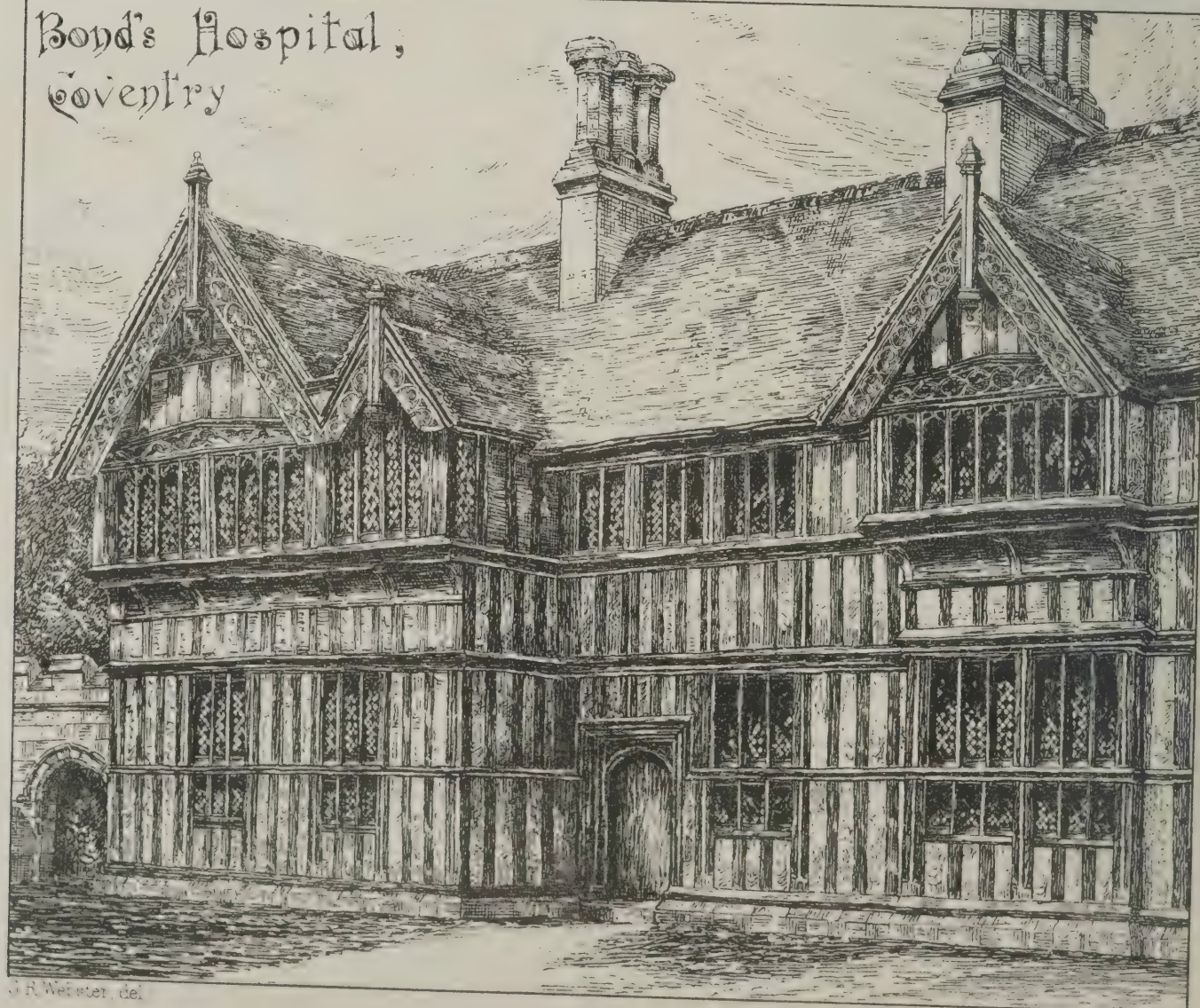
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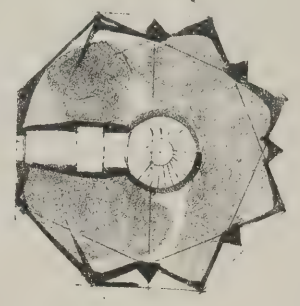
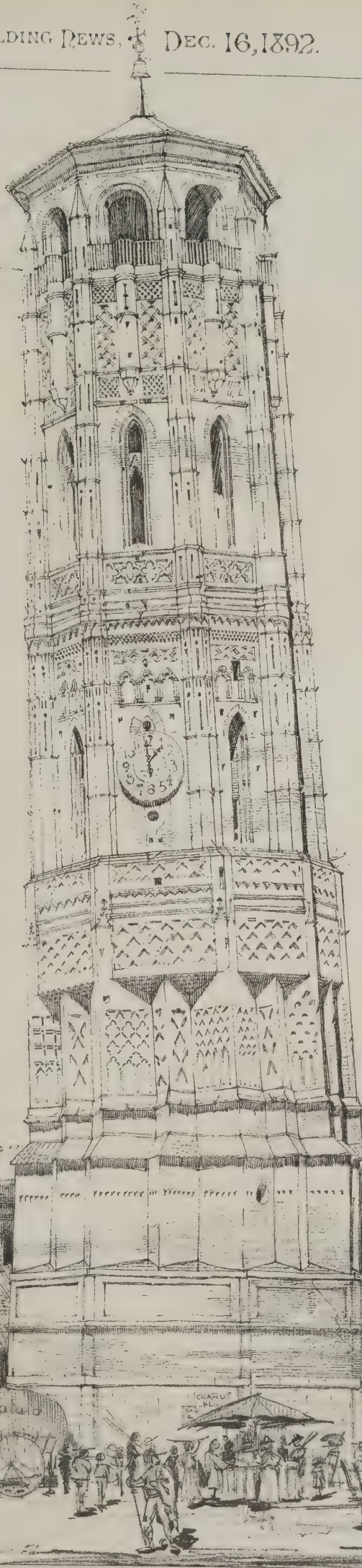
Sheffield Telephone No. 11.

Old Bablake
Hospital

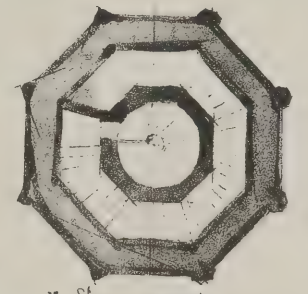


Bond's Hospital,
Coventry





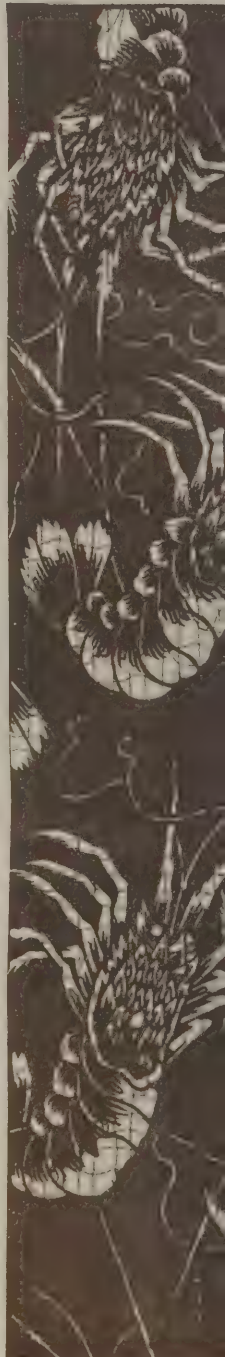
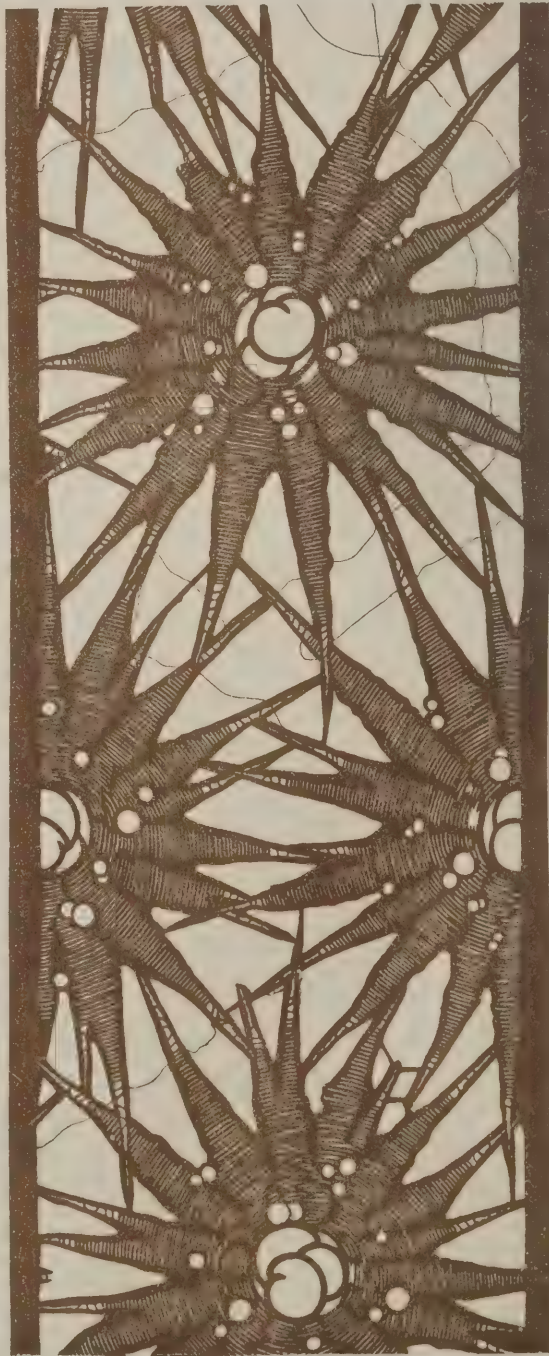
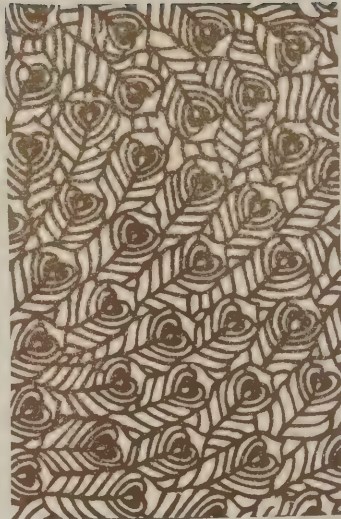
Plan of 1st Stage. 2nd Stage



3rd Stage 4th Stage

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WS, DEC. 16, 1892.

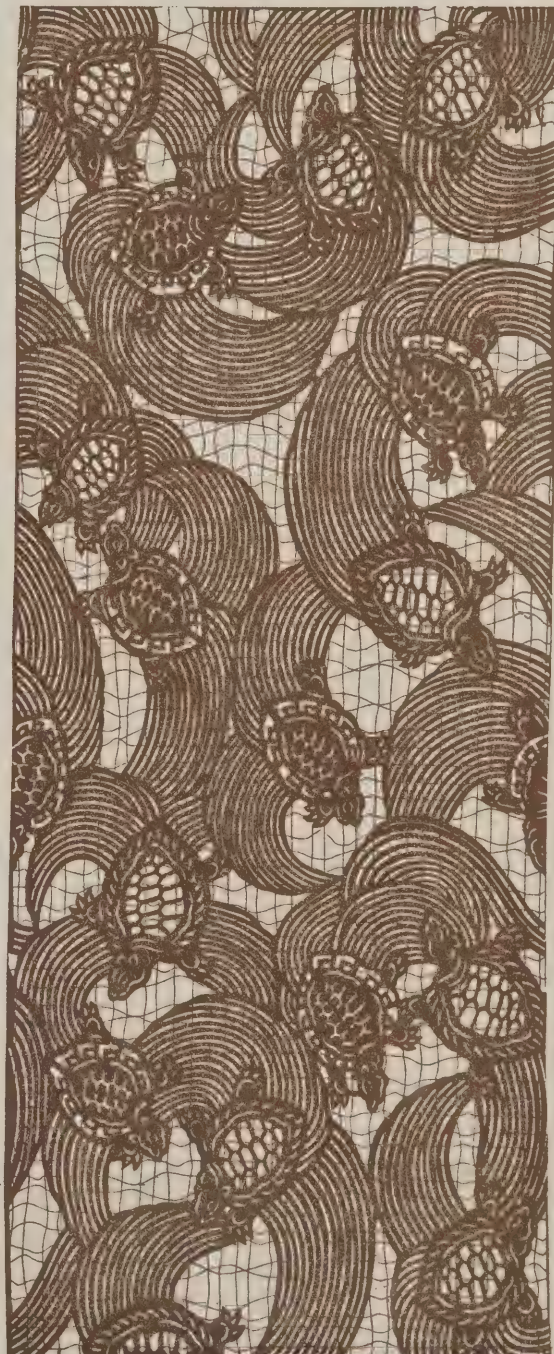
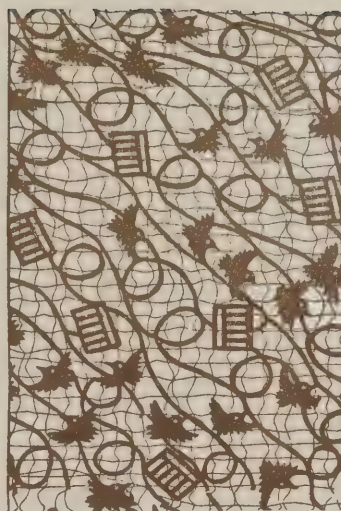
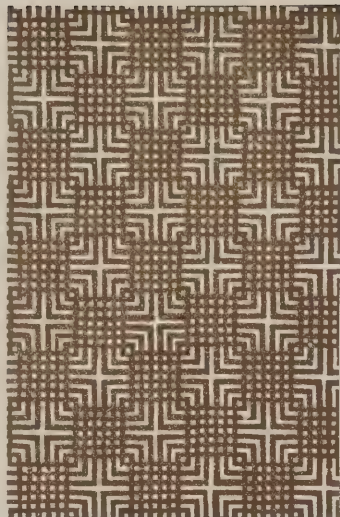
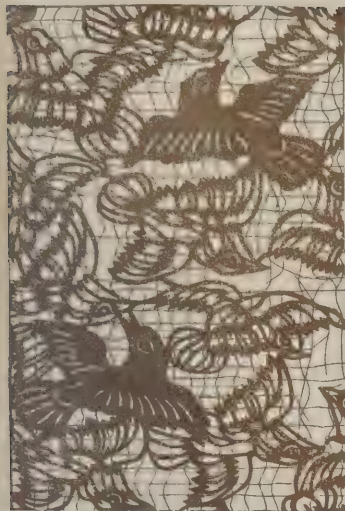
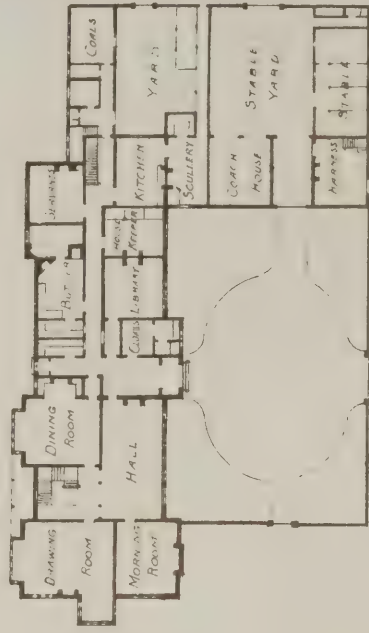


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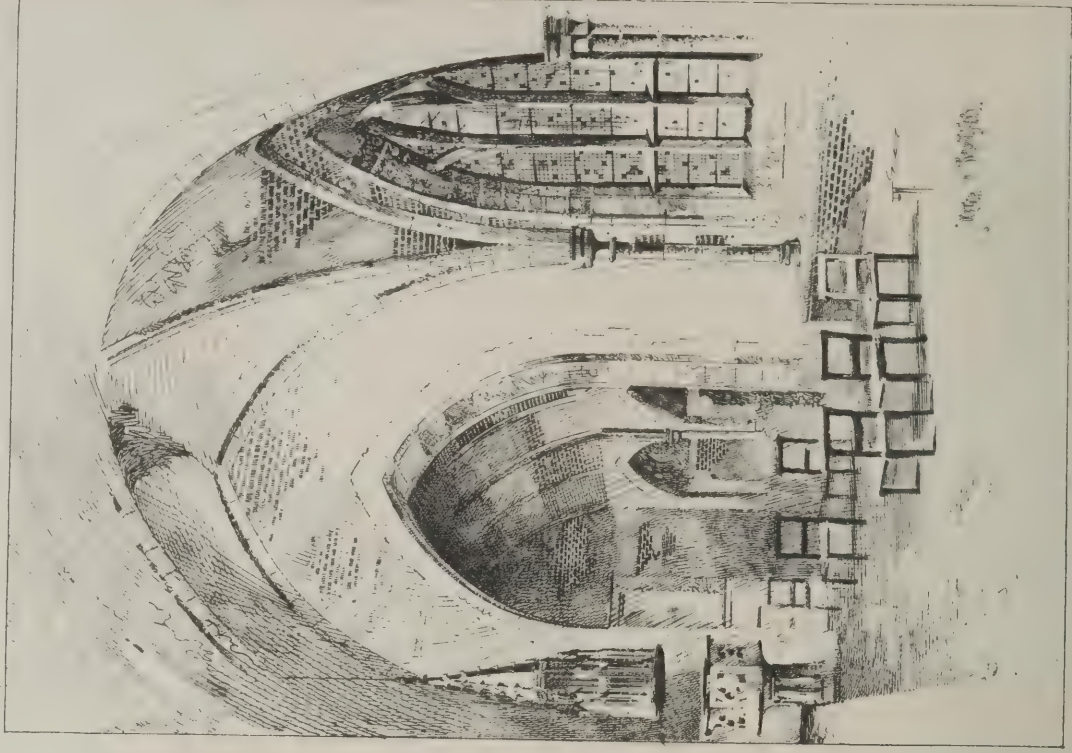
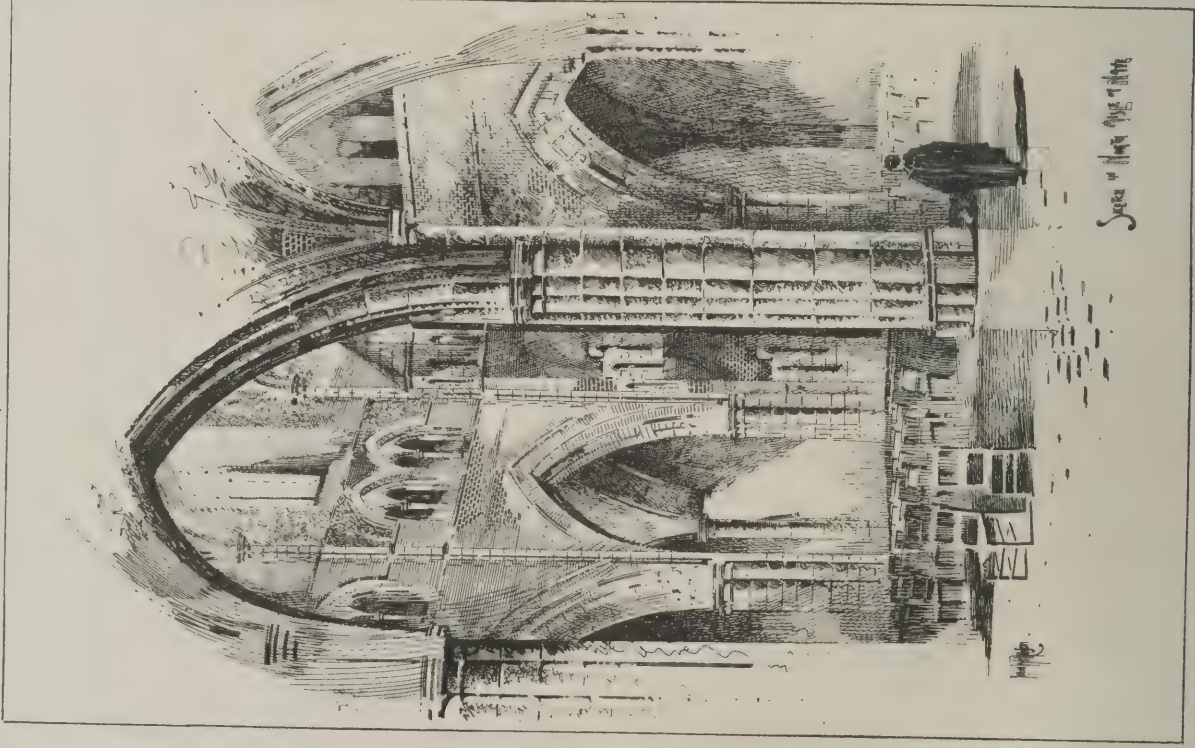
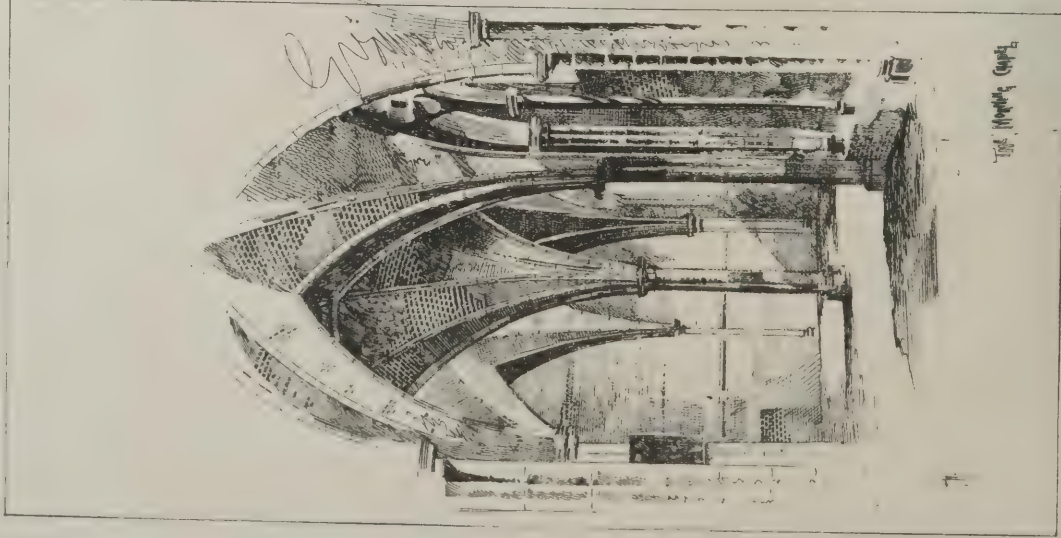
THE BUILDING REWS, DEC. 16, 1892.

House to be built near Alford.
Horace C. Frasier, Architect



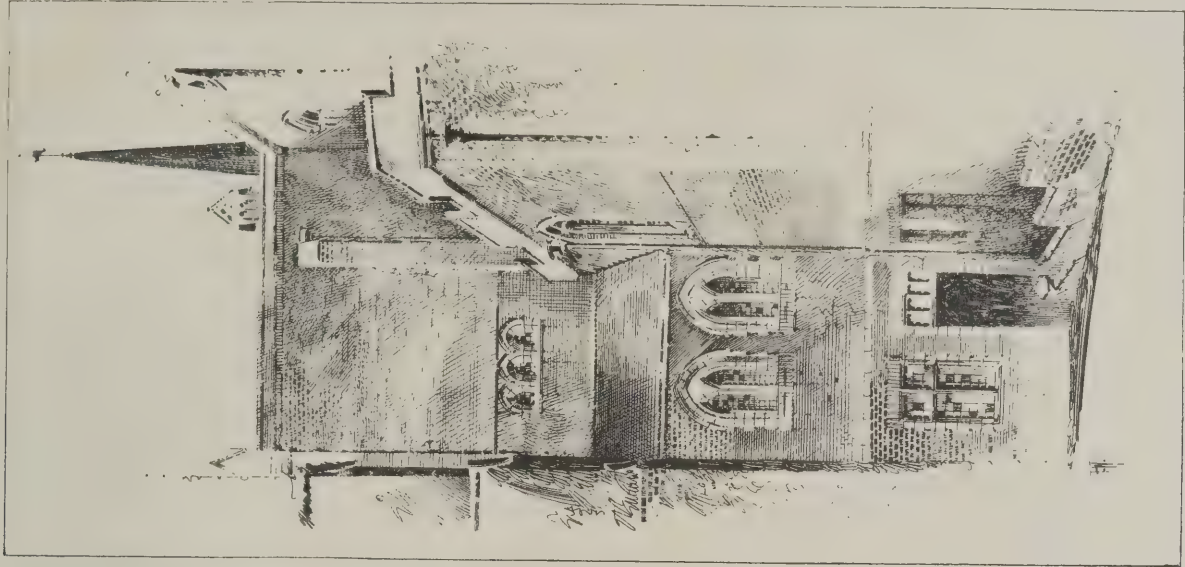
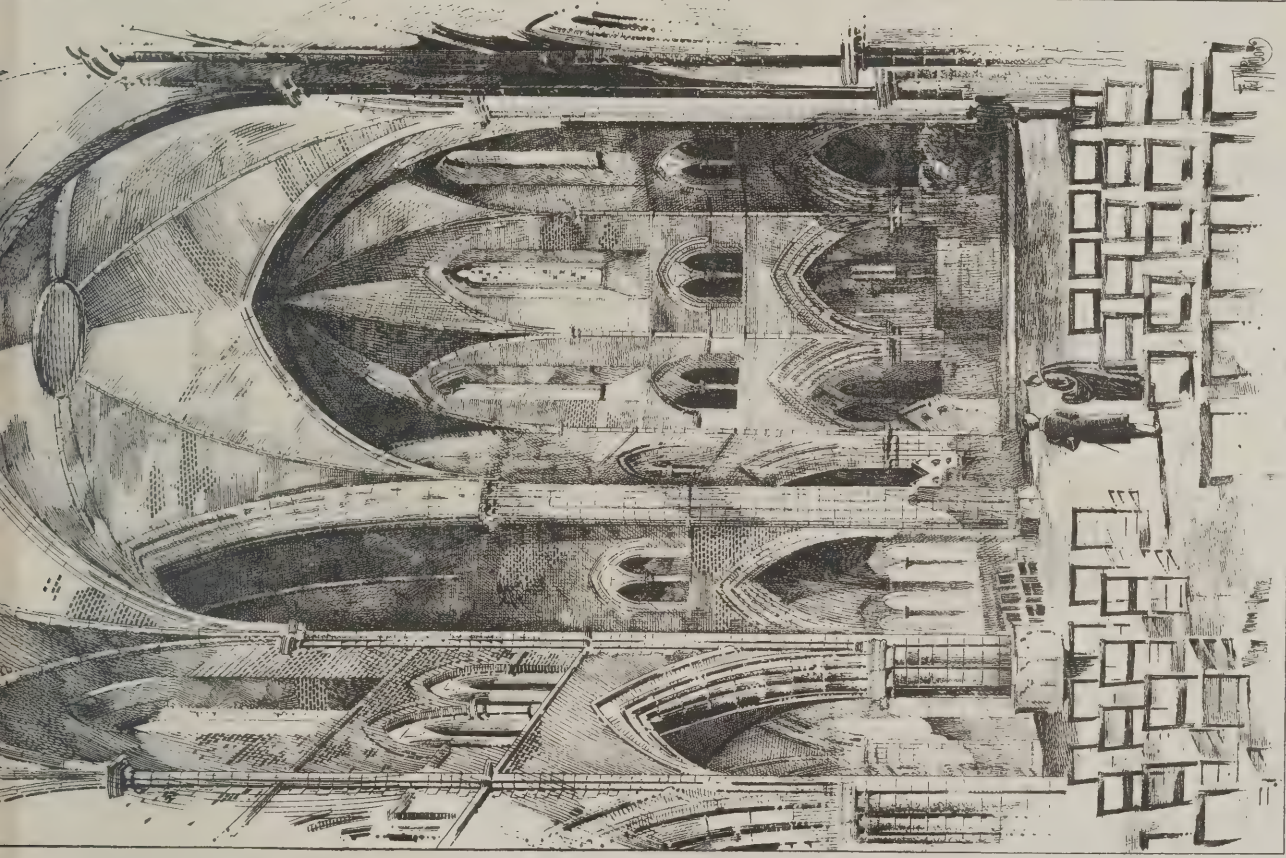
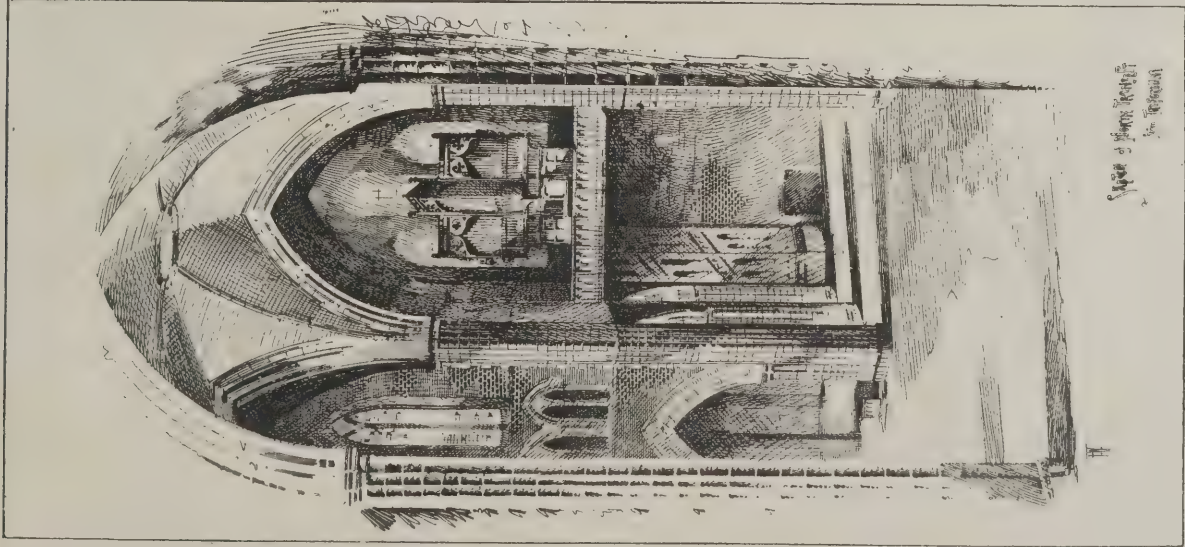


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THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1981.

FRIDAY, DECEMBER 23, 1892.

WALSALL TOWN HALL AND BATHS COMPETITIONS.

A PROGRESSIVE spirit has taken possession of Walsall, the busy Staffordshire centre of the tanning and harness-making industries, for it is astir with many municipal and sanitary projects. The Corporation of the borough invited architects to send in designs for a town hall, to be used for public meetings and other purposes, on an important central site of the town, lately cleared under an Improvement Act. The position is between three streets, Green-lane and Wolverhampton and Townsend streets. The site itself is of triangular shape, the obtuse angle being to the north, while the main corner, facing Park-street—the principal business street—is reserved for the chief entrance. The accommodation required, besides the main hall on ground floor, a basement for kitchens, dining-hall, lavatories, stores, &c.; on the ground floor, entrances for the orchestra, ladies' and gentlemen's cloak-rooms, lavatories, and retiring rooms, an orchestra and galleries round the large hall, having separate entrances, caretaker's apartments, with the necessary corridors and staircase communications.

Of the forty and upwards sets of plans submitted, three have been awarded premiums, these being "Bruin," by Mr. H. H. McConnal, of Walsall; "Straight and True," by Mr. H. A. Cheers, of Twickenham; and "W" in a circle, by Messrs. Malcolm Stark and Rountree, of Glasgow. The design of Mr. McConnal's is marked by some good features. The large hall, 95ft. by 51ft. 6in., exclusive of the orchestra, is placed with its axis parallel to Wolverhampton-street; the main entrance is at the Park-street corner, which is made an important architectural feature. The large hall is entered at this end as well as by side corridors, each 7ft. wide, which flank the hall, each of them having three entrances. The author has cleverly arranged his main entrance and lateral corridors. On the side towards Wolverhampton-street the corridor is terminated by projecting staircases, the one at the east corner forming the tower in connection with the principal vestibule, and the other the staircase exit from gallery and floor level. It is pierced by windows along the main front. On the north side of hall the corridor is architecturally united by a short corridor to the side entrance at the apex of triangle by the introduction of a circular vestibule, domed over as a lantern, and partially open to the corridors by columns. From this circular vestibule access is obtained to the mayor's parlour on one side of the entrance and to the gentlemen's and ladies' cloak-rooms on the other. The messengers' room and lavatories form triangular-shaped rooms on either side of this north entrance, the angular irregularity being thrown into the vestibule. Gallery staircases and exits are also provided at the ends of north corridor in connection with the great hall, and at the west corner at the back of orchestra there is an orchestra entrance and lobby, and two retiring-rooms. The first floor has a gallery all round the large hall. The town clerk is located in a room of hexagonal shape over the side entrance, or obtuse angle of plan; committee rooms are placed right and left over mayor's parlour and cloak-rooms, and the circular vestibule we have mentioned has a dome light in connection with north corridor, which gives

access to gallery. At the back of orchestra are retiring-rooms for the artistes; and over the principal entrance the upper part of vestibule is shown, with corridor connecting staircases on each side of the principal vestibule—a good point in this plan.

The author allows on ground floor of hall for 910 persons, in galleries 670, and in orchestra 230, making a total of 1,810.

In section the author shows a flat-pitched, iron-trussed roof over the hall, with large circular headed clerestory windows above the corridors, which project like aisles on each side; there are also the corridor windows. The interior features of hall include an elliptical arched platform end supported on pilasters, and some nice treatment of the side vestibule and entrances. The elevation towards Park-street has a semicircular entrance on steps, and over it a tetrastyle arrangement of pilasters supporting a pediment. Flanking this porticoed front on the south side is a tower of dignified proportion, plain and campanile-like below the main cornice, the upper story having a smaller square belfry, with disengaged angle columns in pairs, and cupola termination. The lower portion of tower is rusticated. The side elevation towards Wolverhampton-street shows circular-headed Italian windows, parapets and terminals at the angles.

The second design, by Mr. Henry A. Cheers, under motto "Straight and True," shows a similar general arrangement of hall, side corridors and entrances; but the author, carrying out the principle expressed in his motto, has made all the main walls and rooms straight and rectangular and balanced, and in this respect it differs from "Bruin." The triangular outline of buildings is broken by angles and cants, giving a rather more pleasing grouping to the plan. The hall, 100ft. 6in. by 56ft., has a circular ended apse for platform at the west end, round which and both sides the corridors traverse, though only one doorway to hall is shown in the centre of each side corridor besides the main entrance at the east end. The principal entrance is up a flight of steps to a rectangular hall, which leads into the large hall. This entrance hall is flanked by a tower which forms a gallery entrance, and is well proportioned, and has a pleasing outline. On the north side, conforming with the obtuse angle of site, is another entrance and grand staircase, on each side of which are the gentlemen's and ladies' retiring-rooms. The plan shows excellent provision for the artistes at the orchestra end, with separate entrance to stage and stairs to gallery; but there appears to be not so good an arrangement of entrances and exits as in the first plan. The author extends the seating area of his large hall by showing side galleries over the lower corridors, thus extending the width of hall to the outside walls, making it 75ft. wide. Piers divide the length of hall into six bays, and between these the width is 58ft. A deep gallery is shown over the end entrance hall, besides orchestra galleries on each side of platform at the other end. An organ recess is also shown. The shape of this end of the hall forms an octagonal recess, with quadrant-shaped corners, the irregular angle being filled with retiring rooms and staircase. The large hall has a curved flat inner ceiling over the centre portion, with flat ceilings over the galleries; it is well lighted by side windows in Wolverhampton-street, and over the roof of lower buildings on the north side. A centre ventilating trunk is shown on the section over the arched ceiling and a rather steep roof. The dining-hall is, as in other plans, in the basement, which looks rather ill-lighted by borrowed lights. The committee rooms are below the main entrance.

In external design, the Italian Renaissance is chosen, of red brick, with stone in the dressings. The main façade facing Wolver-

hampton-street has six semicircular windows with mullions and transoms; the arches are broken by projecting voussoirs, and the spandrels are filled with emblematic tablets and ornament with balustrades along the top. The gallery entrance porch has a semi-octagonal projection from corner tower; the platform roof is apsidal, and the large hall has a roof hipped at the ends. The main entrance-front is wanting in dignity; the gable end window and porch destroy the breadth of the design, the former being a little fussy in detail, but the redeeming feature is the tower. A coloured perspective is sent in.

"W" in a circle has some good points; the buildings are set out at right angles within the boundary lines, and present in plan a broken outline, well balanced. The main hall, as in the other two, runs parallel to the long side, with corridors on both sides, from a central hall at the principal entrance end. These corridors surround the platform end, which has a semioctagonal apse. On the north side, filling up the obtuse angle of site, is the dining-hall, forming a low-roofed building with domical lantern, and the roof of which building is on a level with the gallery of great hall. On each side of this triapsal-shaped dining-hall is a circular-ended staircase to gallery. The main hall has seating capacity for 968 persons. The circular-ended cloak-rooms on each side of corner entrance, and the stairs up to gallery and down to basement on each side of entrance vestibule, make a well-balanced front, which is pronounced by a boldly-designed round archway with massively-moulded piers and jambs. The lavatories and other necessary offices are in the basement. Three side entrances from each lateral corridor give access to the great hall. The section shows a flat coffered and coved ceiling, parapets, and a steep roof surmounted by a handsome flèche. The main elevation is broken by small gables over end windows; these are circular-headed and mullioned, with panels over, and the hall is pronounced, the ridge-line running through level, the whole having a dignity of character. The entrance elevation is broken by a curved and pinnacled gable, having a circular-headed window in the gable end, with large flanking terminal turrets at the corners. The drawings are rather rough and unfinished. A coloured perspective is sent in.

The authors of these designs have displayed much ingenuity in their plans; the shape and position of site have made it of importance to obtain at least three presentable fronts to the streets. Viewed from the east, the designs in some cases are rather chapel-like in character, not a few of them resembling the City Temple. The sum of £20,000 has been stated as a limit; but we have no reason to think that that sum will be greatly exceeded if the materials are of red brick and stone. The hall, which is to seat 1,800 persons, is rather small in orchestra accommodation in one or two instances, though additional room for instrumentalists and others might be improvised if necessary. The difficulty of making the obtuse angle architectural is obvious, as the buildings will be comparatively low and unimportant, and the oblique return lines will require some skill in bringing them into harmony with the two ends. No doubt on these grounds the rectangular treatment of the buildings, by breaking them to the boundary lines proposed by the two last premiated designs, and others of the unsuccessful, has the advantage.

In some of the returned designs this arrangement has been skilfully carried out, notably in the design under motto "Saddler's Arms." The obtuse angle is occupied by a low-roofed refreshment saloon or bar, that can be used in connection with the main hall, covered by a domical light, with a circular apse filling up the angle. Other good points in this design are the main central

tower entrance and gallery stairs, each being kept separate and having distinct entrances, and the quadrant lavatories, which are in connection with the cloakrooms on each side of vestibule, and which help to give variety and gradation to the return fronts. The value of making the side corridors available by swing doors for the purpose of entertainments in the hall is also exemplified in this and other plans.

The three designs for the public baths, now on view in the same Art Gallery, show a careful consideration of the conditions insisted by Mr. R. H. Middleton, Assoc. Mem. Inst. C.E., the borough surveyor, whose decision the council have wisely adopted. The site is an irregular one, bounded on two sides by a brook, and on the other sides by roads. The design placed first by that gentleman is by a London architect, Mr. Horace T. Bonner. Notwithstanding certain criticisms made by an anonymous correspondent some time ago, the author has in no way encroached on the land reserved by the corporation for houses and shops, which shows a clear depth from Lichfield-street of 75ft., except the centre passage way, 12ft. wide, to the entrances of baths. The author has the first-class and second-class swimming-baths placed with their ends to the brook and at right angles to Lichfield-street. The former is 80ft. by 30ft., with side dressing-boxes, and the second class 60ft. by 25ft. In front, and towards the entrance, are the Turkish bath and the men's first and second-class private baths; and on the right-hand irregular-shaped part of the site next the brook are, beginning at the rear, the ladies' and artists' rooms, a large washhouse, mangling-room, committee and engine-rooms, and in front, facing the street, the first and second-class women's baths and boiler-house. The entrances for men and women, with their halls and waiting-rooms, are well arranged, a waiting-room for each department being provided so that no confusion can occur. The pay-office is in the centre; on each side are the first and second-class halls for the respective classes, with corridors in direct connection therewith, so that the classes are separated; the first-class swimming-bath can be used for women or men, without interfering with other departments. Another good point is that the same distinction is provided for the Turkish baths, which occupy a square space between the two corridors and in front of the first swimming-bath. "Mermaid," the second plan selected, is, curiously enough, the work of the winner of the first design for the town hall. The swimming-baths are placed across the site parallel to Lichfield-street; the large one is 103ft. by 46ft., with a water surface of 85ft. by 30ft., and the second class is 76ft. by 37ft. out to out. The entrances are from the road from Lichfield-street. The ticket-office is in the centre, and corridors run between first and second-class slipper baths, these corridors look narrow. The plan is, however, well grouped: there is a gallery round the 1st class swimming-bath, the baths have elliptical iron roofs, with lantern lights, and the engine and boilers are well placed in the rear, and are accessible. The elevations are architecturally treated. The third design, "Health," by Mr. S. Loxton, shows the swimming-baths placed as in the first plan, with centre corridor and a cart road on south side. The entrances are not so well arranged, as the entrance for second-class men is so arranged that the men would have to pass by the women's second-class slipper baths. The Turkish baths are placed to the north of site; the women's and men's private baths are in front and side of the second-class swimming-bath. The roofs are also of the iron-tie class, and the elevations are simple but commonplace. The instructions provided that the first-class swimming-bath can be adapted as a gymnasium, and for this purpose the com-

petitors have provided a gallery round the bath in some cases. The total cost is not to exceed £7,000.

UNPROFESSIONAL PRACTICES.

IN the so-called "learned" professions there are certain rules of professional etiquette observed, especially in the law; any interference with the acknowledged rights and duties of one solicitor or barrister by another is sternly rebuked; but amongst architects there appears to be a very lax conduct in dealings with one another. A code of professional ethics has been often talked about, but no definite rules have been framed binding on the whole profession, albeit without this general agreement very little can be accomplished in this direction; in fact, we scarcely can hope to look for any such amelioration till the profession of architecture becomes a registered body amenable to statutory powers. There are many practices which daily take place among architects and surveyors which are certainly wanting in professional conduct, or that can be said to be decorous. One of the commonest customs is that of touting for work. In the provincial town especially the custom prevails to so large an extent that few people are inclined to take much notice of it. Mr. James Smith, a wealthy tradesman and town councillor, is about to build a residence, and as soon as the rumour is afloat he is besieged by several of the architects of the town, who are bent on the same errand of soliciting employment. Though it may be well known that the said Smith has consulted an architect who has even prepared designs, such information has no effect in the least on the canvassing proclivities of A., B., and C., who individually are eager to show their own superiority in professional skill, and even to vie with each other in detracting from the abilities of the other two, sometimes going so far as to blacken one another's character. Each sends a number of drawings of buildings, or goes so far as to prepare designs on approval, till Smith, wearied by these importunities, refuses to have any more interviews, or to see any more designs. We can understand a fair solicitation by sending a professional card when the contemplating building owner has not quite made up his mind; but the practice of "touting" after an architect has been engaged is most reprehensible and quite unprofessional. We know of all kinds of things having been said and done by touts of this class to win the confidence of clients as well as committees. We are well aware that in the excitement and rivalry of competitions some excuse may be found, but the most unwarrantable assertions are made, which in no other profession would be tolerated. A., B., and C. are competitors in the same town for a public building, whose designs are both well spoken of. A. obtains an interview with one or more of the committee or town council, and does not scruple to misrepresent B., or to pick holes in his plan; while C. goes so far as to print and circulate information to the detriment of the favoured design. We cannot find fault with the competitor who, when he has the opportunity, points out the merits of his own design and criticises the plans of others; but this sort of thing may become something worse than bad taste. When plans are under motto or number, individual criticism cannot do any harm, and must do some good in drawing attention to points of arrangement; but these disparaging remarks are often carried beyond the bounds of fair criticism. We protest certainly against the habit of some members of the profession who seek to prejudice the minds of committee and assessor while the plans are being discussed, and we think that such conduct is deserving of severe censure. After a decision has been made everyone has a right to say what he thinks of the design; it then becomes public

property. Architectural competition has indeed furnished many glaring examples of the need for a standard of professional ethics or conduct in matters of this kind. The most unparliamentary tactics have been resorted to, such as disclosing names, the private circulation of mottoes, correspondence in local papers, publication of private circulars, and other methods of influencing the minds of committees and the public. These are methods that ought to disqualify anyone who resorts to them. The practice of calling on members of committees in such cases is wanting in common respect and etiquette, and no individual who has any regard for his profession would condescend to do such a thing.

There are other practices which are equally culpable and unprofessional, and we notice a few of them here in the order they occur to us. It has been our unpleasant duty of late to record several instances of touting or advertising by so-called architects, in the remembrance of many readers. In those undignified announcements we often find the profession of architect associated with all kinds of trades and callings, such as those of builders, undertakers, auctioneers, house agents, and even public-house businesses. These advertisements are not only detrimental to their authors, but injurious to the profession, and cause it to be held in disrepute. The public at once draw inferences as to the status of those who thus tout, and unpleasant comparisons are made damaging to the profession. Quacks and mountebanks there always will be, but let the representative bodies of the profession try and stop a practice that has done incalculable harm to the calling.

A more reprehensible practice even than touting for business, because it involves the honourable conduct of architects, surveyors, and engineers, is that of interfering with or going between a brother architect and his client. We have known of cases where an architect or surveyor has been consulted or called in by a client who has disagreed with his own architect about granting certificates or the performance of work. We are not alluding to the case of a properly appointed arbitrator under the terms of a contract, but to an irregular invitation made by the client or the builder. In a properly drawn-up contract such an irregular interference would be impossible, as that of the following case. An architect declines to give a certificate of completion, whereupon the builder consults Mr. Bouncer, who writes a letter to the official architect asking for a meeting at the building to measure up and value the work executed. Of course the latter can decline to meet the builder's nominee who has the questionable taste to interfere with a brother architect's work. It is an unwritten law in the ethics of every profession that it is unprofessional and wrong to accept any consultation in a work or business in which another member of the profession is employed without invitation to do so from the latter. Yet we sometimes find an architect accepting an offer to pass an adverse opinion on his brother-professional's work, or even going out of his way to give advice prejudicial to the appointed architect. The effect of such criticism or advice is to imply a doubt as to the ability of the architect or engineer engaged without giving the latter an opportunity of explaining his mode of operation or of rebutting the advice. It is very easy to criticise. One may say, "I should have made the plan so and so," or point out a better or safer mode of construction of a roof than that adopted, without knowing the circumstances or the actual requirements with which the architect has had to comply. How often we hear of the architect's sanitary arrangements questioned by another of the same cloth—perhaps a trivial question of trapping or of ventilation magnified into an importance it scarcely deserves. The architect in charge has a right to be

first heard, and to accept or refuse the client's wish to call in an expert. If he refuses, the employer can only ask him to resign. No other course would be fair. The duty of the expert called in is clear: he should consult the architect before making any report.

A flagrant breach of professional etiquette is often noticed in the Courts of law. Professional witnesses are found really to give any evidence against their brother architect as to questions of fees or of negligence. This is the more glaring when their evidence is made to prejudice the jury, or by giving answers upon insufficient knowledge of the facts. Many other instances of unprofessional conduct might be cited if only we had the space; but those we have instanced are enough to show to what extent unprofessional dealings are carried on. An American contemporary has prepared a short code of ethics to meet these practices. The rules given are good as far as they go, but the difficulty in the way is the general acceptance of them by the profession as a body. The main societies and their affiliated branches should certainly use their influence to prevent these practices amongst their members. The rules of membership generally include restrictions as to certain kinds of practice; but our experience is that the transgressors in these instances of malpractices are not entirely confined to non-members of professional societies.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AN ordinary meeting of the Institute was held on Monday evening, the President, Mr. J. MacVicar Anderson, in the chair. It was decided, on the recommendation of the council, to admit to alliance with the Institute the Institute of Architects of New South Wales.

THE HYPÆTHRAL TEMPLE.

A paper on this subject, written by Dr. WILLIAM DORPFELD, F.S.A., of Athens, and translated by Mr. Gill, was read by Professor Aitchison, A.R.A., Vice-President. Having summarised the violent disputes about the question of the existence and form of the hypæthral temples, and the diametrically opposed views thereon, as exemplified in the opinions of L. Ross and C. Bötticher, the author expressed his opinion that recent excavations had completely settled this point. Mr. F. C. Penrose's excavation of the Olympeion at Athens showed that this temple was octastyle, and thereby a new light was thrown upon the description of hypæthral temples given by Vitruvius (iii. 1). On this passage had been based the opinion that the Parthenon at Athens and the Temple of Zeus at Olympia were hypæthral temples, and from this it had been deduced that all the peripteral temples similar to these, with an interior order of columns, were hypæthral. By way of showing that this view is now untenable, the author proceeded, first, to note the chief arguments used for and against the existence of hypæthral temples. It was argued that the cellæ of many temples could not have received the necessary light from the door, and so a top light must be taken for granted—though opinions differed as to the shape of this opening: a wholly uncovered nave (K. F. Hermann); a small opening in the centre of the cella (C. Bötticher); openings of various shapes and sizes over the aisles (James Fergusson). To this argument he replied, that although the light entering through the door of a cella could not have lighted up the interior in the way necessary for a modern museum, yet such an amount of light was neither necessary nor aimed at. The impression produced by the statue would gain in proportion as its details would only gradually be perceived by those entering, after they had accustomed themselves to the semi-obscurity. In the similar case of the sculptures on the exterior of temples—for instance, the pediment and frieze of the Parthenon—no one had deduced from the fact of their elaborate details that they could not possibly have been placed so high up on the temple. That the illumination from the door was, moreover, not so small as people usually supposed, was shown by J. Durm's tabulated statement of the proportion of the door-openings to the area of the

cellæ of several Greek temples. To the argument from the existence of altars in the interiors of temples—that an hypæthron was needed for the escape of the smoke from sacrifices—it was answered that sacrificial altars were generally in front, and not in the interior, of temples; and that ceilings blackened by smoke were not considered unsightly. The author rejected the argument from certain finds which had been deemed to indicate the existence of a skylight in the roof of some temples: such as the curbstone found near the Temple of Ægina, and the tiles with round openings near the Temples of Olympia, Phigalia, Tegea, and Athens. These tiles were used for the lighting of the roof in those temples where the roof was accessible, and when it was not thought desirable to put a window in the pediment. We had, he urged, no certain bodily proof for the existence of an hypæthron in a Greek temple. Nor had the defenders of the hypæthral temple laid any great stress upon the arguments indicated above, but mainly based their theory upon a passage in Vitruvius, which had been shown by the excavation of the Olympeion at Athens to bear an interpretation totally opposed to the one that it had hitherto received. It was now demonstrated that the Olympeion was octastyle, and not decastyle as had been commonly held; and every reason for believing that the "octastylus" of Vitruvius was the Parthenon had disappeared. Neither Parthenon nor the Zeus temple at Olympia could now be named as hypæthral temples, nor could it be admitted that the majority of peripteral temples with an interior columniation were lighted hypæthrally. Those in favour of hypæthral temples had the onus of producing positive proof that the ordinary peripteral temples must have been lighted from above. He did not deny that the hypæthral temple did exist; but the temples which received their light through the ceiling were exceptions compared to the great number that were only lighted from the door. Dr. Dorpfeld closed by asserting that though a few great dipteral hypæthral temples existed, the Greek and Roman temples had as a rule no light from above, and were only lighted from the door.

Mr. F. C. PENROSE said he agreed with almost everything that Dr. Dorpfeld had advanced, but he did not think entire justice had been done to Fergusson's theory of the Parthenon. Mr. Penrose exhibited a restored elevation and plan of the Temple of Jupiter Olympeion at Athens as it was completed by the Emperor Hadrian after the Roman manner. He had found four short columns on the site, which were probably set up in the naos, and carried in Hadrian's time a coved and coffered inner roof. The statue of Jupiter, placed at the further end of the naos, was probably lighted through openings in the sloping sides of the pronaos, which could be closed when necessary to exclude the sunlight or rain. Such openings would not, he thought, be pressed through the ridge of the roof of the pronaos, and in so low a pitch of roof would not be apparent from without. The excavations had established the point that the Temple of Jupiter Olympeion was octastylar, not decastylar. He entirely concurred with Dr. Dorpfeld that the roof of this temple was never open throughout.

Dr. A. MURRAY, of the British Museum, said they all admired Dr. Dorpfeld, and recognised that he was apt to be thoroughgoing in his statements. He did not think that the roofs of the cellæ of temples were open, and from a passage in Vitruvius relating to the finding of the body of an armed man in the roof of a temple, it was evident that there was an inner and outer roof, and a considerable space between.

Mr. WYATT PAPWORTH pointed out that as the tiles of the temples were of marble and of large dimensions—3ft. 6in. by 2ft. 6in. at Bassæ, and 2ft. 6in. square at the Parthenon—it was possible that these were translucent, and afforded some dim light. There was a well-known tomb in the British Museum showing openings in the sides of roof.

Mr. MURRAY replied that the treatment of the tomb roof in question could hardly be taken as an illustration of hypæthral lighting. There were certainly small portions at one end covered in with panels, but these were probably only intended for the reception of offerings.

Mr. R. PHENE SPIERS said that in Egypt, where he spent five months, all the tombs were lighted only from the doors, and that in cases where the walls of absolutely dark passages were covered with paintings and sculpture that could only be

seen by artificial light. He had seen nothing in Greece to lead him to suppose that the temples were lighted otherwise than from the door.

Professor AITCHISON, in replying, referred to the difficulties experienced in ascertaining the meaning both of Pausanias and Vitruvius. There could be no doubt that in Hadrian's time the Temple of Jupiter Olympeion was lighted from above.

In reply to questions and remarks by Messrs. HUGH STANNUS, J. M. BRYDON, and W. KIDNER, Mr. PENROSE said there might be something in the theory that the marble tiles were semi-translucent, for all the examples of those tiles found were of the Parian marble, and not like the walls of the Parthenon of the closer-textured Pentelic marble.

ARCHITECTURAL ASSOCIATION.

THE fifth meeting of the present session was held on Friday evening, the President, Mr. H. O. Cresswell, in the chair. Attention was called by the President to the lectures in the Fourth Division of the History of Architecture. Few members had as yet sent in their names, and he requested those who proposed to join to write before the close of the year.

THE FORMAL GARDEN.

A paper on this subject, illustrated with numerous pen-and-ink sketches by the author, was read by Mr. F. INIGO THOMAS. In his introductory remarks he satirised the views propounded and methods adopted by the modern landscape gardener, contending that his work lacked definiteness and virility. Since the very origin of the word "garden" is garth, an inclosed space, my conception of a garden is, Mr. Thomas continued, a walled-in area, and among the characteristics of the formal garden you may safely put inclosure at the head of the list. No matter what the form of this boundary, each inclosure will be a separate garden in itself; hence the plural term "gardens," which, if applied to the work of the landscapist, has no meaning at all, since his scheme (if so it may be called) wanders on indefinitely, without let or hindrance, except for such weak bounding lines as are afforded by an iron railing three bars high, or a sunk fence. In the old engravings the garden-courts are sometimes figured with reference to a note, in which case we find them described individually by such terms as "west garden," "base-court," "parterre," "coronary garden," and the like; but the walls and hedges that were employed for this were not only of use in keeping distinct the various kinds of gardens. In 1701, we read in Defoe's "Tour," "The Pond-garden (at Hampton Court) was laid out into small inclosures surrounded by tall hedges to break the violence of the winds and render them proper for the reception of such exotics in summer as were moved out of the conservatories during the season"; and Mr. Baring Gould, in his book on "Old Country Life," comments on the capital shelter that these garden-courts afforded. For this purpose yew is certainly the next best thing to stone or brick, and in some respects even better. A wall is more monumental, but, if unsympathetically built, will never give a chance to all the wealth of vegetation that makes the charm of an old wall. Again, a wall is not so hostile to a flower-border as a yew hedge, for the yew, being a greedy plant, sucks much of the good from the surrounding soil that ought to go to the flowers. But against this, it may be said that there is no finer background for flowers than the sombre green tapestry of yew, and there is no better protection from wind than is to be obtained by the filtering property of a thick hedge. And besides the actual use these divisions are for shelter, they also have a sentimental charm in the idea of seclusion and mystery that they give to the ground so divided. I know of nothing more suggestive of hidden beauties, and more stimulating to the imagination, than a glimpse of sunlit lawn with stately flights of steps that is sometimes caught through an open garden door. Given the inclosure, in my ideal garden formality goes a little further. The paths are straight, or, at least, geometrical. The flower-borders inclosed with a trim edging of box, and the fountain has its softly-moulded rim of mossy stone. The turf is level as a table, and whatever standard yews are necessary to emphasise points in the design will be clipped into such quaint shapes as shall suit my fancy. But inside the borders and over the walls flowers and

creepers run riot. From the works of the landscapist, one would judge that, having made his borders irregular in outline, he feels that his responsibility is ended, as it seemed to be a matter of indifference to him whether they are planted with formal lines of flowers or not. The beds so planted in the London parks are of use to inform us how even in size certain plants can be grown if properly tended; but there the interest ends, and we begin to wonder whether after all the game is worth the candle. In short, the landscapist's garden is no garden at all, but merely a wilderness; and in bringing his wilderness close to the house he is not only reversing the time-honoured usage of our forefathers, but is acting contrary to what must appear to be reason to all those who value decency and order. His vaunted natural treatment of the ground is not natural, but only slovenly artifice, and I would go so far as to put forward the apparent paradox that it is most natural for man to be artificial. The history of the early gardens in England is a little enveloped in obscurity. In the old MSS. they appear to be referred to rather as fruit-orchards than flower-gardens. For example, in the office of the Duchy of Lancaster is preserved an account rendered by the bailiff of Henry de Laci, Earl of Lincoln (who died in 1312), of the profits arising from, and the expenditure upon, the earl's garden in Holborn, then in the suburbs of London, in the twenty-fourth year of Edward I. £9 2s. 3d. in money of that time—equal to about £135 of modern currency—was received in one year from the sale of fruit alone. This tends to show that profit was the main object with which the garden was kept up. Alexander Necham evidently had in his mind the idea of a garden for pleasure when he said that a "noble garden" should be arrayed with roses, lilies, sunflowers, violets, and poppies. But probably much ingenuity was not shown in the design of gardens until the 15th century, when fountains and conduits begin to grace the pages of illuminated manuscripts. We hear of an early garden at Westminster and another at Windsor, but at first the flowers seem to have been a secondary consideration to fruit and vegetables. It was the growing popularity of the game of bowls, requiring, as it does, a broad expanse of level turf, that paved the way to the great pleasures of a later date. As to whether terraced or hanging gardens existed here in early times we are left rather in the dark. Many people seem to suppose that this method of treating the ground was the direct result of Italian influence; but they are apt to be blind to the very essential differences between an Italian and an English garden. They ignore the preponderance of turf to gravel, the habit of growing more plants in beds than in tubs, the restraint in the matter of statuary, and the peculiarly English colouring that is given to the whole by our northern climate and materials. And even if, after all, we are bound to admit foreign initiative, why, pray, should we call our gardens Italian, if we feel our buildings at that time to be so essentially English that we have had to call them Elizabethan? The privy purse expenses of Henry VIII. give us a good deal of information with regard to his gardening operations. These, with the help of a contemporary picture or two, and some little imagination, may conjure up for us a fair idea of the Royal garden at that time. It appears to have been framed on a comparatively small scale, walled in and divided into four compartments by gravel paths, and the borders protected by barber-poled railings with a royal beast holding a flag at every corner. A part of it is to be seen through the doorway in a picture (by Holbein?) now at Hampton Court. The garden at Nonsuch was, perhaps, much in the same state as at the time of Henry VIII.'s death, when it was described by an eye-witness. All through the reign of Elizabeth her courtiers were vying with each other in the splendour of their palaces and gardens. John Thorpe shows a design for one among his drawings at the Soane Museum. He notes, by the way, that there is to be "nothing out of square." Hatfield, Longleat, Hardwicke, and all the grand buildings of that most stately period had similar surroundings. Their arrangement was, with infinite variation in detail, something as follows:—Between the projecting wings of the house on the entrance front a space was paved in stone or marble, with a few steps leading down to a gravelled court with walls on the side connected with the house. This was called the "forecourt," and often had a

fountain in the centre between the porch and entrance gateway, with garden doors on the other two sides, as you may see at Montacute, in Somerset. Before arriving at this court there was in many cases a sort of ante-court, which seems to have been for dignity solely. In those days it was not the custom for guests to alight at the front door. To one side of the house, and a little apart from it, stood the stables, with a kitchen-court between them and the house. This was called the base-court, and in it was hidden away all the untidiness that is consequent on the proximity of kitchen and stables. On the other sides of the house lay the more ornamental pleasure-gardens, under which head comes the "parterre," the bowling-green, the "coronary" garden, herb-garden, &c. Perhaps the best contemporary account of an Elizabethan garden given with any regard to detail is to be found in a letter written by one of the officers of the Court to Master Humphry Martin, mercer, of London. It is dated from Kenilworth, 1575, and describes a visit of Queen Elizabeth to the castle and, *inter alia*, the gardens. In front of the castle was a terrace walk raised 10ft. above the garden and 12ft. wide; at either end were arbours "redolent by sweet trees and flowers," and along the balustrade, on the garden side, obelisks, spires, and coats-of-arms in stone were set out at equal distances. Below this terrace was a garden, an acre or more in extent, divided into four quarters by fine sanded walks. In the centre of each plot rose an obelisk of red porphyry with a ball at the top. The garden was planted with apple trees, pears, and cherries. In the middle of the wall, opposite the plot, was a great aviary, 30ft. long, 14ft. broad, and 20ft. high, and in the centre of the garden a fountain of white marble rose out of an octagonal basin. John Evelyn, to whom we are indebted for much information on the subject, had always had it in his mind to write a great book on garden design; but, unfortunately for us, he never got further than the headings of the various chapters. Among these, however, are references to the stage properties of the garden grandeur of his time, quite enough to show how much of garden-lure has been entirely forgotten. Through the latter half of the 17th century garden design had been making great progress, though Charles I. had not done much to encourage it, leaning as he did rather to horticulture than design. Neither do we hear of a great deal being done under Charles II., though he it was who dug the canal at Hampton Court, and made the garden at St. James's. It is difficult to arrive at a very clear idea of the development of garden design up to the time of the Dutch influence, because it was not till then that engravings of country seats drawn from bird's-eye points of view became common. A Dutchman named Knyff was employed at the end of the 17th century to make surveys of many places in different parts of England. This he effected with marvellous accuracy, and handed over his drawings for engraving to a fellow-countryman, Jan Kyp, their joint efforts being published in a large folio, entitled "Britannia Illustrata." From this time forward it becomes an easy matter to trace the course of design. Kyp continued for some thirty years to engrave subjects of a similar kind for various publications, notably Harris's "History of Kent" and Atkyn's "Gloucestershire." After his death, in 1722, his mantle seems to have fallen upon John Harris, who engraved some of the drawings by Badeslade in "Thirty-six Views of Gentlemen's Seats in Kent." This Badeslade was an indifferent artist, as may be gathered from some drawings by him now at Mount Edgecumbe, showing the grounds there as they appeared in his time. In the diary of Celia Fiennes, a lady who rode through the country for her health in the days of William and Mary, recently brought to light from a lumber-room, we get a quaint description of the gardens at Epsom and elsewhere. If we are anxious to know what has happened to all the glorious gardens that she attempts to describe, we must consult the shades of "Capability" Brown, Repton, and the like. For all their vaunted worship of the beautiful, they were great sinners in this respect, and demolished every old garden that came in their way. Sir Uvedale Price, perhaps, if he had lived in our own day, would have been a devoted adherent of the formal school; but he was swept along by the tide of public opinion, and small heed was paid to his touching lament over the destruction of his own

garden, a mistake he realised when too late to remedy. The really grand schemes for approaches, avenues, and much more that lends dignity to a building were generally due to the architect. In 1699 Sir Christopher Wren made a grand scheme for alterations on the north side of Hampton Court. A plan of this exists in the Office of Works, and shows a great courtyard facing north, with a semicircular colonnade leading up to the centre of the banqueting-hall. From this entrance a vista of some miles in length was to lead northwards, flanked by avenues of trees, four rows deep, on either side. At a convenient distance from the palace a cross avenue is shown, and at the intersection a large circle, called the "Diana Circle," where now stands the great fountain in Bushey Park. These avenues are all that was ever carried out of a conception that would have made a truly magnificent approach to Hampton Court, which is, of all things, what the palace most requires. This scheme was on an altogether increased scale to that which was actually carried out on the east side. When Sir Christopher had framed the Churches of Hampton, Surbiton, and Ditton, so as to meet the eye standing in the central doorway of his eastern façade, he perhaps felt emboldened to attempt a still greater stroke on the north side. And Wren was working for a master who was likely to appreciate the extreme grandeur of his conceptions—King William, who passed much of his time at the Royal Palace of Loo, in Holland. Recollections of Loo, coupled with a hope long cherished by the King of rivaling the glories of Versailles, have made Hampton Court what it is, and it is a matter of regret that the loss of his patron prevented Sir Christopher from completing the whole of his contemplated designs. One is accustomed to be told that Harry Wise was the King's adviser in all these matters, but in reading the accounts of the alterations at Hampton Court during this reign, it is evident that the general conception originated in the mind of Sir Christopher, and it was only the details that were left to be carried out by Wise. The progress, which had continued under Wren, with the help of London and Wise, up to the death of William, was succeeded by a decline, gradual at first, but rapidly increasing through the reign of the Georges, till Addison's scoff and Pope's satirical verse sealed the fate of the English formal garden. However short of a healthy revival, nothing better could have occurred since design had fallen into the hands of the nurseryman, and the stately old gardens lost their charm, when the tender care was gone that had kept them trim and neat. Kent followed, and in the words of Walpole, "Leapt the fence, and saw that all nature was a garden." This meant that the old walls were pulled down, and so-called Nature allowed to usurp the place of the garden proper. "Capability" Brown next appeared on the scene. This man was allowed extraordinary licence, and no better example can be found of the tyranny of fashion over weak minds than is afforded by the history of gardens under his iron rule. He was the king of the landscape school, and certainly his ideas were not lacking in scale; but he had an innate horror of anything approaching dignity, which led him to cut down avenues and generally mutilate what had taken years of honest labour to effect. Cobham, in Kent, is an instance of his handiwork. Five avenues of limes once radiated from the central front, but four of these fell victims to his mania for destruction. He travelled about England, compiling books of suggestions for alteration of the various places. Coloured sketches of the house and surroundings as it appeared were covered with a fly-leaf, on which he drew his suggestions, the result being that English parks were enlarged by the addition of the gardens; but the English garden practically ceased to exist. And then, forsooth, we hear writers of the present day (on horticulture, be it observed, not on garden design) claiming the title of "English garden" for the anomalous production that has been in vogue from that time up to the present. "Capability Brown" had as followers in his train Repton and Sir Uvedale Price, who handed on the tradition, such as it was, to the Hughes's, Milners, and Robinsons of our own day. Mr. Milner, in a book distinguished neither as an effort in literature or the better qualities of etching, has retold the old story, already so well worn; and Mr. Robinson's publication stands a confessed counterblast to a book on the formal garden in England brought out by Mr. Blomfield and myself. To these three books I must refer

you to form an unprejudiced opinion on the subject. Having given you a slight sketch of the rise and fall of garden design in general, you will be anxious to hear something more of the details employed in the realisation of these efforts. Perhaps the principle that seems of most importance after that of inclosure is change of level, and a great deal of variety is to be obtained by close-shaven turf seen at different angles with the light. Whenever possible, it has always been preferred that the ground should fall from the house rather than towards it, and though, of course, instances of the former treatment are most usual, still there is a certain charm in the latter, too—which charm lies more in the view of the house from the garden than of the garden from the house. Tissington, in Derbyshire, and Kilworthy, near Tavistock, afford the peculiar effect that is hinted in Sir John Millais's picture of a garden with the gables and chimneys of an old Scotch manse just visible above the walls. The position chosen for the principal terrace was always, if possible, next to the house. But if, as at Rycott, near Thame, the house already lay low, and new gardens came to be added subsequently, rather than forego the terrace altogether it was raised in masonry at the far end of the garden, and in this case the space underneath formed an orangery. Packwood, in Warwickshire, has a terrace 3ft. high between the garden and orchard, with steps on either side, and at Hampstead Marshall there still remains an artificially-raised terrace of generous proportions. Nothing seems to have had such a stimulating effect on the imagination of garden designers as rapidly falling ground. Wherever there have been these conditions a grand chance has come with them for ingenious device in steps and gradients connecting the various levels. Terraces were sometimes carried round two or three sides of a garden if the fall of the ground suggested such a treatment. Penshurst, in Kent, has a long terrace down one side of the main garden, and a wide one next to the house. Cusworth, in Yorkshire, has raised walks round three sides of the bowling-green, and Oxenhoath, Kent, is shown in Badeslade's view with a terrace running round two sides of the garden next to the house, terminating in a pavilion. The more fall, within reason, from terrace to garden below, the better and bolder will the effect be. Haddon has a fall of 16ft.; Pitmidden, 13ft.; and Newton Ferrers, in Cornwall, 8ft. At Oxford, the walk on the ramparts forms a sort of terrace to those of the College gardens that lie under the city wall, such as Merton or New College, for example. Another form of earth-work that is to be found in some old gardens is the mount. This was made square or circular, with sloped sides and terrace walks at intervals, with a railed space at the top commanding a view of the country around. That in the garden of New College still exists; it is 40 paces square at the base, and about 30ft. high, and though now entirely covered with trees and undergrowth, among their roots may still be found the stones of the steps that led from terrace to terrace, and the curb that bordered the paths. This mount is engraved in a view of the gardens by Loggan in the seventeenth century. The largest mount that I remember having seen is at Heath Hall, Wakefield, and is locally called Mount Tarribyte, but it is on such a large scale that at first sight it is difficult to believe that it has formed a part of any garden scheme. Bowling-greens were generally square, though sometimes a circular instance is to be found, as at Knole, in Kent, where it was surrounded by tall hedges of hornbeam, with arbours on two sides, and a sort of baldaquin in clipped work over the steps that led down to the house. This green was forty paces across, and that at Bingham Melcomb, Somerset, thirty by thirty-four, from which it would appear that dimensions were optional. There is a curious oval-shaped bowling-green facing the house at Campsea Ashe, in Suffolk, twenty-five paces by fifty-two. A fine, old yew-hedge runs all round it, and from this rise at intervals twenty clipped yew-trees, with entrances on the four opposite sides. Grass alleys of ample width formed another pleasing feature in old gardens, and were bordered with clipped greenery or palisades of fruit-trees, throwing a broad, even shadow across the turf. Statuary in stone, lead, or bronze, played an important part in garden ornament. Obelisks, sundials, and heraldic beasts, with, perhaps, a curiously-wrought fountain or two, seemed to have formed the stock-in-trade of Elizabethan

gardens. Perhaps of all the features of old garden design, none has called forth such violent invective as the custom of pleaching. It is generally supposed that it came in with the Dutch influence, but inquiry proves that it was the custom in England from much earlier times than these. On the other hand, it was under the Dutch influence that it was carried to such excess as ultimately to bring the formal garden into disrepute from this very cause. No one who has tried it will deny that a yew-hedge when clipped gives a much quieter background for flowers than if left to its natural growth. Kings and queens carved in yew, or foxes jumping through a hoop, as you may see at Broome Hall, in Suffolk, hardly tend, however, to ennoble the whole effect of the garden. However, at Parkwood, in Warwickshire, there is an instance of pleaching that follows out a definite scheme through the whole garden, and commands more serious consideration. The main walks in this garden follow the shape of a capital T, and at the crossing rises a mount, with a tall cone of clipped yew. This was to represent the Mount of Olives, and on it was once a clipped figure of the Crucifixion. The whole arrangement follows out a kind of sacred allegory. At the foot of the mount stand the Four Evangelists, and ranged on either side of the grass alleys that form the cross of the T are the twelve Apostles, and the stem is lined with yews to represent the multitude. This is the only garden I know that has a distinct connected idea running through all the clipped work, and is extremely interesting accordingly. Levens, in Westmoreland, has the Kings and Queens of England, and the old heraldic tradition is kept up in the keeper's cottage at Haddon, where the Manners peacock and the Vernon hog preside over hollyhocks and sunflowers. But failing a double interest of this kind, clipped figures are apt to descend into mere trickeries of a clever gardener. With Tudor times passed away the old custom of surrounding the walls of the house with a moat, and water was henceforward used more for ornament and the breeding of fish, than for defence. There are many instances of moated houses of a later date, but in these cases there is generally a small garden of some kind between the house and the water. In the dressed grounds water was always subordinated to the general design, and inclosed within marked boundary lines of stone or brick coping. Large sheets of water such as were made at Wrest or Hampton Court were bordered with turf up to the margin, and so in the pond in the garden at Melbourne, and a smaller piece in a charming old garden at Sydenham, in Devonshire. No doubt in the treatment of it the Dutch influence was strong. Fountains were placed at intervals in the lengths of the water which generally stretched away from the house in the centre of some long vista, and a good effect was sometimes obtained by falls at intervals from terrace to terrace. Perhaps the earliest example of a fountain still existing in England is that with a polygonal basin, that once stood at Cowdray Castle, and has since been moved to Woolbeding, in Sussex. The centre piece of the great Diana fountain in Bushey Park has a curious history. It was originally in the grounds of the palace, and formed the centre ornament in the Privy Garden, where it was seen and described by Count Montcenys in the time of Charles II.; but after this it was taken down, and in 1713 was removed by Sir Christopher Wren to the position it now holds, and a bill is in existence showing that £1,300 were spent in repairs and fixing. Statuary is of the greatest use as a foil to the sombre tone of clipped yew or hornbeam, and perhaps stone or lead seems to be more at home in an English garden, as the lichens and mosses that thrive in our damp climate take to them more readily than the smaller surfaces of bronze or marble. We all know what capital work England produced in wrought-iron gates and railings during the last century. The impetus in this direction came from the work of Tijou, a French smith, who made the great screens for Hampton Court that now stand in Kensington Museum, and are falsely attributed to Huntington Shaw. Their original position was on either side of the avenue leading to the bowling-green, and it is to be hoped the day will come when they may be reinstated there or in some more suitable position at Hampton Court. The influence of Tijou spread all over England, and instances of elaborate wrought ironwork are too numerous to need particularising here. Indeed, each different craft employed in garden decoration would yield

subject matter for a separate paper. The history of a subject of this kind is only the grammar. It forms the rules by which the game is to be played, and that is where we who style ourselves "artists" should differ from those who bear after their names the honourable initials F.S.A. It is not enough for us to know that these things have been, or the exact period at which they were done. The all-important question with us is, What effect had the designer in view, and how may we hope to obtain equally fine effects ourselves? But the practical difficulties that beset the designer nowadays are manifold and almost insurmountable. In the first place, his client being presumably unfamiliar with the history of the subject, will be at least surprised, if not actually shocked, at the suggestion of such a treatment of his grounds. It will strike him that a comparatively small area is to be inclosed, and that the sum to be spent is exorbitant. And it will probably be difficult to convince him that the desired effect can be obtained in a much shorter space of time than if handed over to the landscapist. And another obstacle is the extreme difficulty of any exact estimation of the cost. Personally I have found it impossible so far to carry out works of this description in any other way than by schedule, as the field for design is so unlimited that a fairly free hand is absolutely necessary for success. All this points to the absolute necessity for a generous and cultivated client; failing which, it would be madness for an architect to enter upon any such scheme. And I fear for many years to come regular gardening will remain the pastime of private individuals. It is not likely that public bodies will awake to its charms till this is once more admitted to be the natural and straightforward way of treating the grounds round a building.

Mr. W. ROBINSON, F.L.S., sent a paper, which was read in his absence by Mr. Gale, the hon. secretary. He said: I will confine myself to existing things, and not speak of old books, which have little bearing on the present state of gardens. The architect is a good gardener when he makes a beautiful house. That is a thing for which one must ever be grateful. Whatever is to be done or considered afterwards, one is always helped and encouraged by its presence. On the other hand, scarcely any amount of skill in gardening softens the presence of an ugly building. No one has more reason to rejoice at the presence of good architecture than the gardener and planter, and all stonework near the house, even in the garden, should be dealt with by the architect in every part. But when architecture goes beyond that strictly necessary round the house, and seeks to replace what should be a living garden by an elaborate tracery or pattern-work, error and waste are at work, and the only possible result is ugliness. The proof of this is at Versailles, at the Crystal Palace in great part, in the old gardens in Vienna, at Caserta, near Naples, where there is a far from beautiful stone garden. One may not so freely mention private places as public ones, but many ugly and extravagant things have been done by trying to adapt a mode of garden design essential in a country like Italy, where people often lived for health sake on tops of hills, to gardens in the plains and valleys of England. I know of a terrace in England built right against the house, so as to exclude the light from and make useless what were once the reception-rooms of a great house! That deplorable result came about by endeavouring to adapt Italian modes to English conditions, and was the work of Sir Charles Barry. One of the best places to consider this question is the upper terrace at Versailles, looking from the fine buildings there to the country beyond, seeing how graceless and inert the whole vast design is, how the clipped and often now dying, because mutilated, yews thrust their ugly forms into the landscape beyond and rob it of all grace. To those who tell me this sort of work is necessary to "harmonise" with the architecture I say no, there are better ways; to rob fine buildings of all dignity and repose by a vast geometrical "pattern" is the worst way. Where formal gardening is done on a large scale, its cost and maintenance are monstrous. The uses and construction to any building made to be lived in secures it the care without which it cannot long exist. Even with the support of a State like France the repair of elaborate stonework in gardens is an endless and almost impossible task, as anyone may see who visits frequently that vast extravagance, Ver-

sailles. Nearer home we may see something of the same kind near the huge stone basins of the Crystal Palace. Is it in the interest of architecture that noble means should be so wasted? It is implied by some writers on this subject that "design" can only concern formality—an extraordinary statement. The artistic massing and giving picturesque effect to groups and groves of oak, cedar, or fir is far higher design than putting trees in lines. There is more true and subtle design in Richmond Park and many noble parks in England, where the trees are grouped in picturesque ways, and allowed to take natural forms, than in a French wood with straight lines cut through it. In the old days when designers dealt with but a few trees, and in many countries not a trace of landscape garden existed, it was well to carry the only formal and "decorative design" into the garden. Now a totally different order of things has arisen, because we have tens of thousands of beautiful things coming to us from all parts of the Temperate and Northern world, and people who know these things will not accept a book design, such as Nesfield adopted at South Kensington, instead of our lovely and infinitely varied garden flora. If anything demands special study it is that of garden design with our present materials. If that art is to be mastered the work of a life must be given to it, and more than that, a life's devotion. No less, I presume, is the sacrifice his own art requires of the architect. There is no such thing as a style fitted for every situation. Only one who knows and studies the ground well will ever make the best of a garden. Any "style" may be right if the site fits it. I never see a house, the ground around which does not require treatment, suited to itself only. Many of the terrace gardens out of place shut off the house from the landscape near. That in the case of a beautiful house is often an irreparable loss. The idea in some minds that the old style of building in England was always accompanied by elaborate formal gardening is proved to be erroneous by many beautiful old houses. The Elizabethan house had often an ample lawn in front, or plenty of grass near, as, for example, at Wakehurst. Such houses are quite as delightful in effect as the old houses and castles where terracing was necessary and right, owing to the ground, such as Naworth, Berkeley, Powis, and Rockingham. Large formal gardens are by no means a necessary accompaniment of our finest domestic architecture. Of this there are many instances among the finest old English houses, Tudor and Elizabethan. The idea that trees must be clipped to make them "harmonise" with architecture is a mere survival. Any attempt to keep the gardener out of the garden must fail, as it did in our own day in the case of the ridiculous broken brick and marble flower-beds at South Kensington. Except for what is mostly a very small area near the house, the architect and garden-designer deal with distinct subjects and wholly distinct materials. They should work in harmony, but not seek to do that for which their training and knowledge has not fitted them. If a genius should arise who will master and practise both arts well he will deserve our sincerest felicitations!

Mr. LEONARD STOKES, in proposing a vote of thanks to Messrs. Thomas and Robinson, said the latter writer had well pointed out that the style of garden must be chosen to suit the site, and he would go further and say that it must harmonise with the character of the house. If the building were regular in outline, with a wing on either side, a formal garden was demanded to accord with it; but if, on the other hand, the mansion—for it was of mansions both were speaking—was irregular and picturesque, a more wild and natural type of garden was required. He fancied the cost of large yews was comparatively great. It should not be overlooked that age and association had much to do with the charm of our formal garden, in which there was a risk of vulgarity and dulness if attempted by an untrained hand.

Mr. L. A. SHUFFREY seconded the motion, and claimed that gardens ought to be laid out by the architect of the house. In dealing with small areas the designer of a formal garden needed to have a very free hand. The mistake in suburban gardens was to begin with too many trees and shrubs, which, as they grew, had to be clipped and thinned out. The late Mr. J. D. Sedding has had much influence in reintroducing the fashion for formal gardens; but the pleading needed to be done moderately, or its vagaries were apt to bring ridicule on the custom.

The PRESIDENT, in putting the vote of thanks, said an architect found a difficulty in showing the effect of his proposed garden to his client. A plan was uninteresting and often unintelligible; the old bird's-eye views of Dutch landscapists of the 18th century were open to the objection that they illustrated the grounds from impossible standpoints. The most practicable method was to sketch small portions of the grounds from two or three points, as it would be seen, and submit these, together with a plan.

Mr. INIGO THOMAS, in replying, said it was no doubt difficult for a horticulturist to understand the view-point of an artist, but in one or two particulars he thought the landscape gardeners were coming round to his opinion. He repudiated the idea that a garden was a museum for various kinds of exotic trees, or that there was any beauty in the effect of a nurseryman's grounds. When Mr. Blomfield and he published their book, Mr. Milner and others declared that the views of Knyff and Kyp were much exaggerated; but he had gone over the sites of twelve or fourteen of these gardens, and found, in spite of alterations, proofs that they were very accurate. At Knowle, Ightham, and Rockingham it had been said that there had not been so much stonework as had been reported; but he had found traces of the masonry and statuary still in position. As to what Mr. Stokes had said he held that all houses, whatever their style, were more or less formal, and no house could fail to look at home within the lines of a walled-in garden. As to these formal gardens being only appropriate to mansions, some of the best remaining examples, because they had been least affected by fashion, were those surrounding cottages.

SANITARY VENTILATION.

A PAPER on the above subject was read at the ordinary general meeting of the Surveyors' Institution, on Monday evening last, by Mr. E. Tidman, C.E., M.S.A. The author began by acknowledging that the subject was one of such width that it was quite hopeless to attempt to deal with it completely within the time allotted to a paper such as his own, and he therefore confined his remarks to the ventilation of buildings, sewers, and house-drains. After enumerating the causes of impurity in the air, and insisting on the necessity of constant circulation and renewal of the air of buildings and workshops, as also in sewers and drains, the author went on to state that "natural" ventilation might arise from diffusion, external air currents, winds, or unequal atmospheric pressure. Every degree of heat, he said, dilates the air to the extent of one 491st part of its volume—hence the flow of warm air from the top of a ventilated room, and the inrush of cold air at the bottom. The effect of impure air was admirably illustrated by statistics with regard to cavalry horses. In some old insanitary buildings the death rate was 180 to 197 per 1,000 per annum; but a remodelling and rebuilding of the stables, with the object of introducing a sufficient supply of pure air, reduced these figures in 10 years to as low as 28½ per 1,000. Probably 75 per cent. of the stables in town were in no better state than these originally had been, and the recent outbreak of farcy and glanders was no doubt largely attributable to these conditions. In wet weather the air was, of course, purer than in dry, owing to the washing action of the rain; but under all conditions there were present carbon, sulphur, chlorine, nitrogen, phosphorus, &c., in greater or less proportions. A man in 24 hours gave off 12 to 16c.ft. of carbon dioxide, and to maintain in a state of vapour the 25 to 40oz. of water passed off from the skin and lungs during the same time about 21ft. of air was necessary. The air was vitiated by combustion, 1c.ft. of coal-gas being capable of destroying the entire oxygen of 8ft. of air, and of raising the temperature of 31,290ft. of air 1° Fahr. Ordinary lamps, consuming 154 grains of oil per hour, would deprive 3.2ft. of air of oxygen. The popular belief that impure air descends in a room was fallacious, a simple test showing that the consumed air certainly occupies the upper strata. The safe amount of cubic feet of air per hour per head might be averaged at 3,000—that was to say, 100ft. changed 20 times per hour, or 1,000ft. changed three times. In London lodging-houses 30ft. super or 240ft. cube is allowed per person; in police houses 50ft. super or 450ft. cube. Poor law dormitories are required to give 300ft. to

healthy, and up to 1,200ft. for sick inmates. The Education Department required 130c.ft. per scholar, while the provision for animals should be for horses and cows 1,200c.ft. to 2,000c.ft. Turning to the ventilation of private dwellings, the author pointed out that the objection to "draughts" was the great obstacle in the way of the adoption of any efficient system, and the object of the sanitary engineer must be to get over this difficulty while allowing a full and sufficient supply of air. An ordinary fire drew about 150ft. per minute, and this quantity could be easily supplied by a very moderate opening in a window by the adoption of a bottom bead, say 4in. deep. A "Tobin's tube," of one or another of the forms usually adopted, was also an efficient expedient; while a modification of the same principle, combined with a screen for keeping out dust, &c., and one of Harding's patent diffusers was recommended where the external air was full of impurities and it was desired to get a steady supply without draught. The author's recommendations on the question of hospital ventilation were not new, and might be summed up in the words, "Give each patient as much pure air and as much isolation from his fellow-patients as possible." Public sewers were, he said, more in an engineer's than a surveyor's department of work; but it was not easy to draw the line between the ventilation of public drains and that of house drains. Surface ventilators were most objectionable, and frequently gave off very dangerous effluvia. Lamp-post ventilators were better, and when fitted with gas-burners at their base were excellent extractors; but if by any means the gas became extinguished, the liability to explosion was a serious source of danger. The great fault of most public sewer ventilation pipes was their inadequate size and limited number, and it was evident that in most cases both size and number must be very largely increased before any appreciable improvement in the air circulation of a large sewer could be effected. The author gave statistics and exhibited plans of works carried out at Eston, where a large tall chimney stack was utilised as a ventilator, but where, as some of the subsequent speakers pointed out during the discussion, the effect was shown by Mr. Tidman's figures to be confined to only short lengths of the sewers. The case of East Grinstead was next taken, where every builder was compelled to insert a 4in. ventilation pipe on the sewer side of his trap in his house drain, so that each house did its share of sewer ventilation, and another 4in. pipe at the highest point of the house drain, by which the domestic system was ventilated. This plan was, the author thought, probably the proper one, but this opinion was by no means unanimously upheld by the other speakers, some of whom at least inclined to the belief that the public body should attend to the sewers, and that the householder should only look after his own house drains. Several well-known facts as to the ventilating of house drains having been very clearly and succinctly put forward by the author, and a brief history of the progressive attempts at grappling with the house drain difficult having been given, the paper concluded with the expression of a hope that although the subject admitted of no very new or startling propositions, nor, in the present state of sanitary knowledge, of any novel theories or revolutionary systems, the discussion which followed might elucidate facts and opinions which would be sufficiently valuable to repay the author for his labour in the preparation of the paper.

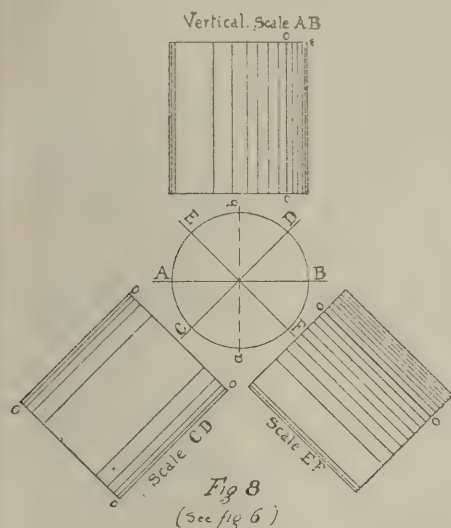
A discussion followed, in which Professor Robinson, who doubted the efficiency, for any considerable distance, of the chimney shaft system of sewer ventilation, Mr. W. Allport, Mr. H. H. Collins, Mr. P. E. Pilditch, Mr. R. F. Grantham, and Mr. A. Harston took part, and the vote of thanks having been put by the president (Mr. C. J. Shoppee), who occupied the chair, and carried unanimously, the meeting adjourned.

THE "RENDU" OF ARCHITECTURAL DRAWINGS.—III.*

THE student will, on referring back to Fig. 6 in the last article, notice that the scale of tints A B employed for marking off the tint lines on the vertical cylinder or column was taken horizontally on the sphere. In order to model the same cylinder when inclined at an angle of 45° to

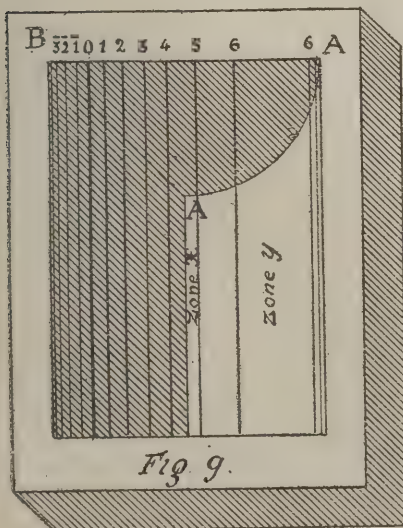
* All rights reserved.

the left or to the right, we must employ other scales, for the light, although coming in the same direction, produces different effects, according to the angle of the object. We see this on referring to Fig. 8, where we have the vertical cylinder AB (similar to Fig. 5) and the same cylinder inclined at an angle of 45° either way, as CD and EF. We notice that the lines of tints are different in the three positions; AB is



well lighted, EF is also well lighted, but CD is in half tone. The horizontal line AB on the sphere (divided as in Fig. 6) is, as was explained, the scale for the vertical cylinder AB; EF, marked off from the same sphere, will be the scale for the cylinder EF; and CD that for the cylinder CD. We will notice that the line EF passes across the brightly-lighted portion of the sphere, Fig. 6; a portion of the cylinder EF to which the scale is applied will, therefore, be well lighted; it, in fact, differs very slightly from the modelling of cylinder AB, as will be seen on comparing EF with AB. The cylinder CD, however, differs very much; the scale CD does not cross the well-lighted portion of the sphere, but only the zones more or less in half tone (Fig. 6), and we will notice that the lines *oo*, *oo* of natural shadow are on the extremities of the diameter of the cylinder; the divisions are also exactly symmetrical on both sides. The modelling of the cylinder in these three positions is most useful; the student, after a little practice, will be able to put in the lines of tints without having to use the different scales, his eye becoming habituated to the right proportions of light, half tone, and natural shadow.

We will now deal with concave surfaces, and



explain the method of modelling, say, the curved concave surface of Fig. 9. We will suppose this to be the mould, or hollow, formed by the vertical cylinder (Fig. 5) or AB (Fig. 8). The half

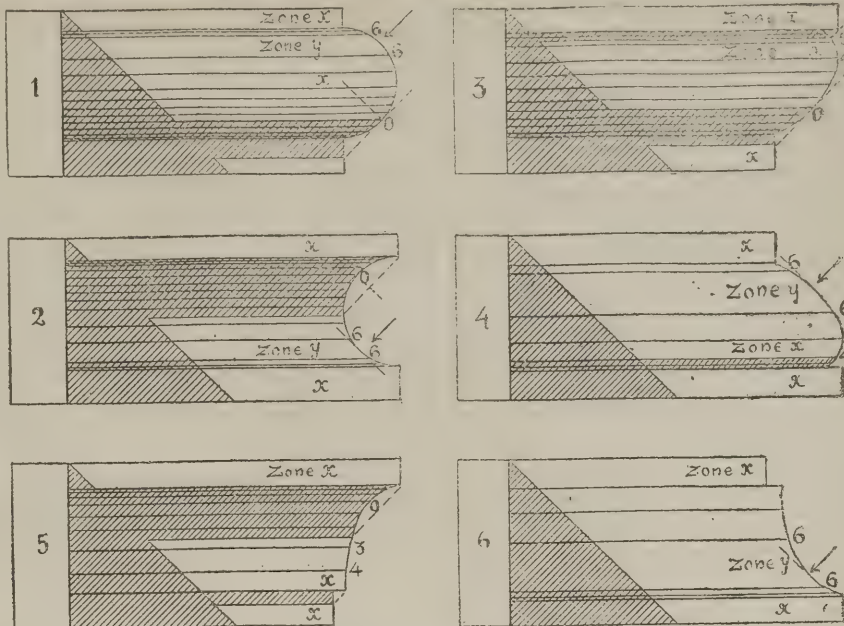


Fig. 10.

cylinder (Fig. 8) is convex, and that of Fig. 9 concave. We shall easily understand that on fitting the first into the second, the different zones of the first will correspond with similar zones in the second, remarking, however, that the zones are reversed, that of the natural shadow *oo* of AB being to the right, whilst that of Fig. 9 is to the left. We may, therefore, use the same scale AB for the concave surface, but reversed, the negative zones 0-1, 2-3 being to the left in Fig. 9, whilst they are to the right in Figs. 8 or 5. In all concave surfaces there must necessarily be a cast shadow, as shown in Fig. 9; the surface being the half of a circle, the shadow is cast as far as the centre line at B, the quarter circle confining the shadow thrown by the soffit BA is drawn from the centre of BA, as is seen in the drawing. The tinting of this concave surface is similar to that explained for Figs. 5 and 7, only we must take into account the effect of the cast shadow. As we have already learnt, an object or zone in cast shadow will be darker in proportion as it would have been bright if the cast shadow did not exist—that is to say, the zones 1, 2, 3, 4 being in cast shadow will be dark in proportion as they were bright in Figs. 8 or 5. This effect may be observed in shadowed drawings; an object which when in the light appears more or less bright, when immersed in cast shadow should appear all the darker and more forcibly indicated.

Let us now model the series of mouldings in Fig. 10. The student, after having studied the convex and concave surfaces of the preceding figures, should find little difficulty in correctly modelling the various mouldings.

Mouldings 1 and 2 are simply convex or concave half cylinders of an unpolished material. We have the four principal zones—first, that of natural shadow; second, that most brightly lighted; third, that of local colour; and fourth, those of the half tints forming the transition between the light and shade. The first three zones are sufficient to model the mouldings; but as here the scale is large, we will employ the six lines of tints as used for the cylinders. For mouldings 1 and 2 we will employ the scale of tints AB (Fig. 6). The zones will be exactly proportional to those in the half cylinders, Fig. 5, AB, Fig. 8, and Fig. 9. We notice that the brightest zone, if between the lines 6, 6, is where the rays of light strike in full, as indicated by the arrows. The line *oo*, where the natural shadow begins, is at the tangent point of the line drawn at 45° . The cast shadow in the concave surface 2 is limited by the line drawn at 45° from the upper projecting portion of the moulding. For the mouldings 3, 4, 5, and 6, we find the cast shadows by means of the light lines at 45° from the projecting portions. The tangents at 45° will give us the zones *y*, the brightest portion of the mouldings, as indicated by the arrows. Mouldings 3 and 5 have no tangent points; the zone *y* is therefore absent in these

two examples. The natural shadow line *oo* is given by the tangents, as in mouldings 1 and 3. The zone *x*, or zone of local colour, is given by the tangent drawn vertically to the mouldings; the vertical surfaces, and those approaching the vertical, marked zone *x*, between the lines 5, 4, are, therefore, in local colour. Thus we have, in moulding 3, firstly, a narrow shadow cast by the projecting fillet (this being a vertical surface is in local colour); then the zone 5, 4, which being tangent to the vertical is also in local colour; then comes the graduated tints as far as the tangent point *o*, where the natural shadow commences. Moulding 4 is brightly lighted at the tangent point; the zone 6, 6; the zones 6, 5, 4 are in local colour. Again, the moulding 5 has its cast shadow as far as zone 3; the zones 3 and 4, being nearly vertical, are in local colour. Moulding 6 is in local colour as far as zone 6, gradually brightening, or, rather, becoming lighter, on approaching the brightly-lighted zone 6, 6.

When tinting these mouldings we must not forget that, as we have said before, a zone which is in cast shadow should be made darker in proportion as it would have been bright if the cast shadow did not exist. The first light tint is passed over all shadows, whether cast or natural; the colour tints are then washed over, gradually darkening as the negative zones are approached. The cast shadows are then put in, care being taken to produce the effect spoken of about zones in cast shadow. The shadows cast on the vertical planes should equal in intensity the tone of the zones on the mouldings nearly approaching the vertical, at 5, 4, or zones *x*. A little practice, and a careful attention to the principal zones of light, half tone and shadow, will enable the student to model effectively all kinds of mouldings.

ARTHUR VYE-PARMINTER.

GOTHIC ARCHITECTURE.*

MR. WALTER ARMSTRONG'S translation of M. Edouard Corroyer's work on Gothic architecture is a volume that will be read with interest by all architectural students. M. Corroyer, inspector of diocesan edifices, writes from a French standpoint; he regards every Gothic development of importance as having a Gallic origin, and he traces to French influence the most remarkable edifices of English Gothic. These views will be questioned, no doubt, though the value of the treatise as a clear exposition of the evolution of Gothic will remain. What the English student will most regret is the want of examples in his own country, those described and illustrated being mainly French. The author writes: "The architectural period which began in the middle of the 12th century, and is so unjustly dubbed Gothic, was of purely French

* Gothic Architecture. By EDOUARD CORROYER, Architect to the French Government. Edited by Walter Armstrong. London: Seeley and Co., Limited, Essex-street, Strand.

birth; its cradle was the nucleus of modern France. Aquitaine, Anjou, and Maine, were the provinces in which it first took root. The Royal Domain and notably the Ile-de-France witnessed its most marvellous developments, and it was from the very heart of France that its splendour radiated throughout Europe." This sentence is the keynote of the author's argument—all developments of Gothic may be traced to Romanesque, and the groined vault itself had its embryo in the pendentives of the dome of St. Front, and the architects of the Ile-de-France were the first to adopt it, and subsequently invented the flying buttress. The cupola of St. Front, though borrowed from a church at Constantinople, was thus an original development, and was the germ of the groined vault and its system of buttressing throughout Western Europe, though the flying buttress was more timidly introduced, especially in the South. M. Corroyer says little about the bolder flights of construction in the North in which the flying buttress was used.

As the dressed stone cupola of St. Front is claimed to be the origin of the intersecting arch, no anterior Roman vault can be accepted as an explanation, but of this further proof is required. A plan and sketches of the pendentives and cupolas of St. Front, and plans and sections of the cupolas of Angoulême are given to illustrate this point, and other steps towards the development of the intersecting vault, as we see in the churches of Angers and Laval, illustrative sketches of which are given. In the third chapter one or two mistranslated terms occur; one of these is the word "ossature," which would have been more correctly translated *skeleton*. The author takes particular pains to prove the identity of the function of the pendentive with the Gothic intersecting arch, and that the cupolas of Angoulême developed into the groined domical vaults of the church of Angers. We are next shown examples of the intersecting vault system, such as the view of a church near Avignon, the nave of St. André at Bordeaux, St. Etienne at Toulouse. The church of La Ste. Trinité at Angers is illustrated, and is a fine instance of the transformation. All the great abbey churches and cathedrals of the latter part of the 12th and of the early part of the 13th centuries show the development of the system; the bays were square, and each was divided by a transverse arch, carried by shafts, as at St. Trinité, Angers. Out of this system grew the flying buttress, which forms the subject of a separate chapter, and is illustrated by sections of Durham, Noyon, Soissons Cathedrals. Churches and cathedrals of the 12th and 13th centuries are discussed, and well-engraved sketches and sections are given of Leon, Notre Dame, Sens, Bourges, Rheims, Amiens, Chartres, Mans, Beauvais, Lichfield, Lincoln, and other cathedrals. Those of the 14th and 15th centuries follow. The other chapters deal with towers and steeples, choirs, chapels, sculpture, painting. Part II. takes up monastic architecture, and Part III. military architecture, while a concluding section is devoted to civil architecture, a few good engravings of which are given.

ALMANACKS AND DIARIES FOR 1893.

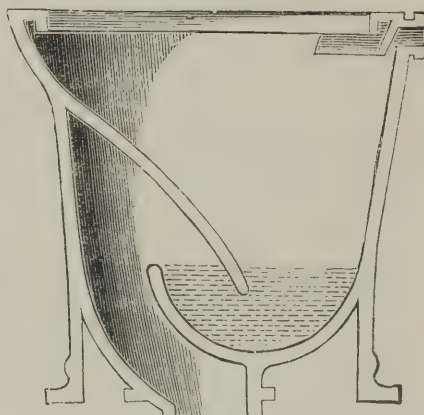
FIRST and foremost, as usual, undoubtedly are the Architects' and Builders' Diaries, and the Registered Date-Indicating Blotting-Pad of Messrs. Hudson and Kearns, of 83, Southwark-street, S.E., which are now to be found in every well-appointed office. The luxuries of one age become the necessities of another, and our own recollections, alas! carry us back to the times when these aids to business, which are now indispensable, were not to be had for love or money. All we can say is, as we write up the memoranda in the one particular Indicator we reserve for our own desk, that we cannot realise how a quarter of a century ago we did without it.

One of the handsomest wall calendars for 1893 we have seen is issued by the Rugby Portland Cement Company, of Rugby. There is a useful detachable monthly date-card in the centre. Above is a well-coloured view of the works at Rugby, and all round are an instructive and nicely executed series of geological views, illustrating successively an ideal view of a marshy forest during the coal period, a landscape of the Upper Oolite period, the Silurian period, the Eocene period, the Liassic period, the Eocene period, and the Upper Cretaceous period. Below

is a Geological section across England from Holyhead to Dover, and above that is a view of part of the quarry at Rugby.

THE "CHAMPION" COMBINATION WATER-CLOSET.

MESSRS. WRIGHT, SUTCLIFFE, AND SON, of Globe Sanitary Works, Halifax, have introduced to the trade their "Champion" combination water-closet, which is in pedestal form, but constructed on the wash-down principle. For solidity and strength it will compare favourably with any in the market. The material chiefly used in the manufacture is extra strong fireclay, obtained from one of the best-known sources in Great Britain; porcelain enamelled buff outside, and white inside. It is made on the soundest principles of sanitation, and is undoubtedly one of the best and safest closets ever introduced. It has a straight back outlet, and possesses a good water seal, which makes it most reliable and certain against sewer-gases. The cup of the basin always retains a water-depth of 5in. While embracing these advantages, its working power is safer and more effective than the ordinary wash-out closet, as only a flush of 2 gallons is needed. When



flushed, the force of the water is brought to play directly on to the contents of the trap, insuring a complete clearance therefrom. The strength of the water is not impaired, as in other types; but, by a peculiar arrangement in construction, the water is conducted to play on the trap immediately it enters the basin.

The closet has already received the approval of a large number of architects, sanitary engineers, builders' merchants, plumbers, &c., and the sales are continually increasing.

It is specially adapted for use in outside buildings, public works, barracks, factories, warehouses, schools, prisons, and other places where strength, durability, and cleanliness are desiderata.

We are informed that they have been favoured with orders from a number of local boards and other public bodies, who express their satisfaction with the efficient working of the closet.

This closet can also be supplied with the inside formation on the wash-out principle.

METROPOLITAN IMPROVEMENTS.

THE Bill of the London County Council providing for the making of new streets and street improvements, the rebuilding of Vauxhall Bridge, and the establishment of a ferry between Rotherhithe and Ratcliff, has been deposited at the Private Bill Office, as required by the Standing Orders of Parliament. The Bill sets out the estimates of the cost of the new Central-street and subsidiary streets between Holborn and the Strand at £3,869,550; the approach to Tower Bridge, £436,000; the widening of Wood-lane, Hammersmith, £47,215; Vauxhall Bridge, £484,000; Rotherhithe and Ratcliff Ferry, £483,000; widening approach to south side of Woolwich Ferry, £3,000; and there is added £45,000 for cost of sites for rehousing displaced persons, making a total of £5,327,765. In addition to the new street from Southampton-row to St. Mary's Church in the Strand, the Council propose to set back the railings around the church and throw into the widened roadway part of the

enclosed ground at the west end of the church, to form a junction roadway at the southern end of Central-street, making a double junction with the Strand on the east and west side of St. Mary's Church, and to remove the block of buildings between Holywell-street and the Strand. A new or widened street following the line of Wych-street is to be made, which will form a junction with the new Central-street, and other streets are to be made from the latter street to the south-west end of Houghton-street and the south-western corner of Lincoln's Inn-fields. In connection with the Tower Bridge approach there are to be widenings and new roads made, and the railings around St. Mary Magdalen's Church, Bermondsey, are to be set back. Provision is to be made for the erection of a temporary bridge at Vauxhall while the existing bridge is being demolished and the new one built, and over the new bridge power will be taken to lay tramways. The time for the acquisition of the property for the new Central-street improvement is limited to five years, and for the other improvements to three years. A feature of the Bill, which will probably prove fatal to its success, is the provision for the imposition of an "improvement charge" upon adjoining property in respect of all the works other than the Wood-lane widening.

In addition to these Bills, the London County Council have deposited at the Private Bill Office a General Powers Bill. One provision in the Bill has reference to the prohibition of the erection of dwelling-houses on low-lying land, which is below the level of Trinity high-water mark, or which is subject to flooding, or which is so situated as not to admit of being drained by gravitation into the existing main sewerage system. Provision is made in the Bill for compensation to workmen who are injured by working with the compressed air in the formation of the Blackwall Tunnel. Other clauses amend the definition of sky-signs, and provide for lighting the Victoria Embankment and Waterloo and Westminster Bridges by electricity.

CHIPS.

The Directors of the Highland Railway have received an intimation that the Government has resolved to contribute a sum of £45,000 towards the cost of extending the Highland line from Strone Ferry to Kyle, a distance of 10½ miles, and constructing piers on both sides of Kyleakin Ferry.

It is proposed to commemorate the jubilee of the consecration of St. Catherine's Church, Barton-on-Irwell, by erecting a new chancel and carrying out other alterations in the structure, at an outlay of £1,630.

The new building for the Spanish Reformed Catholic Church in the Central Park, Madrid, has been consecrated by the Archbishop of Dublin. It consists of three parts, the central of which is a church, that on the right being synodical halls and schoolrooms, and that on the left a pastor's house. The church is Byzantine-Gothic in style, and is about 60ft. long by 35ft. broad, with an apse. The cost of site and buildings adjoining was about £10,000.

The extended time granted for the construction of the Tower Bridge expires in August next. Though, at the present moment, the engineer, Mr. J. Wolfe Barry, is confident that the bridge will by then be ready for opening, the Bridge House Estates Committee, with a view to providing against contingencies, purpose in their Bill asking Parliament to extend the time by a further period of one year—viz., till August 12, 1894.

Lady Alice Ashley opened on Saturday a model lodging-house for men in Macklin-street, Drury-lane, which has been erected by the Society for Improving the Condition of the Labouring Classes. The site cost £1,325, the new building £2,157, and the furniture £250, making a total of £3,732.

The Cardiff Town Council have advanced another stage in the proposal to build new Municipal Buildings, Post Office, and other public institutions on a portion of Cathays Park. The Marquis of Bute has written offering to sell 38 acres of the park (which has a total area of 59 acres) for a sum of £120,000, being at the rate of £3,158 per acre. The various public bodies interested have been wanted to appoint representatives to confer with the Town Hall Committee, and to appoint a joint deputation to interview Lord Bute's agent, and arrange terms.

Wings are being added to the Congregational schools in Water-lane, Radcliffe, Lancs. The buildings provide four class-rooms, the largest being 33ft. by 22ft., and the cost will be £700. Mr. Smith, of King-street, Manchester, is the architect, and Mr. J. Rigby, of Radcliffe, the contractor.

CONTENTS.

Walsall Town Hall and Baths Competitions	867
Royal Institute of British Architects	869
Architectural Association	869
Sanitary Ventilation	872
The "Rendu" of Architectural Drawings.—III.	872
Almanacks and Diaries for 1893	874
The "Champion" Combination Water-closet	874
Metropolitan Improvements	874
The Building News Directory	881
Our Illustrations	875
Wayside Notes	894
Operative Painters' Conference	894
Obituary	894
Draining and Plumbing Specification.—III.	895
Ilford Local Board Offices	896
Building Intelligence	896
Engineering Notes	896
Competitions	897
Archaeological	897
Architectural and Archaeological Societies	897
Correspondence	897
Intercommunication	899
Legal	899
Legal Intelligence	899
Our Office Table	900
Tenders	902

ILLUSTRATIONS.

ANTWERP CATHEDRAL.—NEW PREMISES OF SIR JOHN BENNETT, LIMITED, CHEAPSIDE.—CHAPEL OF UNIVERSITY COLLEGE, DURHAM.—STALLS, SCREEN, AND GALLERY FOR PRINCETHORPE PRIORY.—SEMI-DETACHED HOUSES, BELFAST.—ST. PHILIP'S CHURCH, STEPNEY.—ST. SAVIOUR'S CHURCH, WESTON-SUPER-MARE.—CAST-IRON MANTELPIECES.

Our Illustrations.

ANTWERP CATHEDRAL, FROM THE PLACE VERT.

THE Cathedral of Notre Dame, Antwerp, is one of the most remarkable and extensive churches to be seen in the Netherlands, with its lace-like steeple and silver-toned bells, dominating the town in which it forms the chief and naturally the most important object, both for scale and interest. We give to-day a view by Mr. J. R. Hutchinson, of Westminster, showing the building from the Place Vert, with the familiar statue of Rubens in the fore part of the picture, and we have to add that our illustration is taken from the large etching published for the artist by Messrs. Clifford and Co., of Piccadilly. The south transept just comes into the sketch, and the deep aisle roofs are just seen over the tops of the inclosing houses. It may be interesting to note here that the architect of the spire was Jan Amelieus, who began the work in 1422. It was finished by Appellmaus, of Cologne, in 1518. The steeple is one of the loftiest in the world, being 404ft. high. It contains sixty bells, the "Carolus" weighing 16,000lb. The view from the upper gallery extends to Flushing, Mechlin, Brussels, and Ghent, and commands the river Scheldt.

LXV. CHEAPSIDE, E.C.

THE refitting of these premises for the directors of Sir John Bennett, Limited, were executed during the summer by Messrs. John Grover and Sons, contractors, from the designs of Mr. A. Burnell Burnell, F.R.I.B.A., Eflingham House, Arundel-street, Strand, W.C. The old frontage was reduced by half, but the striking figures (so well known for their advertising capabilities) had to be retained, which, no doubt, to some extent dwarfed the new elevation.

UNIVERSITY COLLEGE CHAPEL, DURHAM.

THE Castle of Durham, formerly belonging to the Bishop of the Palatinate, was in 1834 given to the then recently-founded University, and is now "University College." The original chapel of the castle was built during the episcopate of Bishop Flambard, Chancellor to William Rufus; but it appears to have been disused early in the sixteenth century, when the present chapel was built by Bishop Tunstall about 1540. It is, as will be seen from the drawing, of the very latest Perpendicular work, but, like the rest of Bishop Tunstall's work, is of considerable character. It was originally only 37ft. long, but after the Restoration Bishop Cosin lengthened it by 20ft., moving out and replacing Bishop Tunstall's east window, and at the same time panelling the open roof. At the west end is a somewhat remarkable screen, also the work of Tunstall, but altered by

Bishops Cosins and Crewe. There are also some exceedingly fine stalls and desk ends, originally put into the chapel at Auckland Castle during the episcopate of Bishop Ruthall, 1509-1522, but moved to Durham by Tunstall, who records the fact in his accounts:—"1547-8. To Robert Champne, Esq. 17 days in takyne downe of the stalls in the hye chapel and sortynge of them, and dyghtinge and dressinge of them, and helpynge to conveye them to Durran." When the castle was handed over to the University the chapel appears to have been in a somewhat dilapidated state, and it was then partially refitted with stained deal, and the east end panelled with some remarkable inlaid work from the great pulpit of the cathedral, then recently removed. This work has now been placed in the cathedral library. A few years ago the present Master and Bursar determined to restore and refit the chapel, and the first work undertaken was the rearrangement of the old stalls, and completing them with new work, the western screen being at the same time moved further back into the ante-chapel to accommodate the increased number of undergraduates. Next followed a new marble pavement, and then the altar and triptych shown in the view, together with panelling round the east end, and the work has been completed this year by panelling with oak the rest of the chapel. The triptych is exceedingly well carved, the figures in the centre representing Our Lord crucified, Our Lady and St. John, and St. Longinus and St. Mary Magdalene. The doors have also excellent figures in bas-reliefs of SS. Ambrose, Augustine, Cuthbert, and the Venerable Bede. The altar now has angels painted in the panels. All these works have been designed by and carried out under the personal direction of Mr. C. Hodgson Fowler, F.S.A., M.A., of Durham.

ST. MARY'S PRIORY, PRINCETHORPE, WARWICKSHIRE.

MESSRS. JONES AND WILLIS, of 43, Great Russell-street, and Birmingham, have lately completed the oak stalls for the conventual church of St. Mary's Benedictine Priory, Princethorpe, Warwickshire, from the designs of Mr. Joseph Stanislaus Hansom, F.R.I.B.A., of 27, Alfred Place West, South Kensington. The work involved the removal of the old stalls, which were erected over thirty years ago from the designs of the late Mr. Joseph Aloysius Hansom; the removal of a dark and clumsy ante-chapel, with two lateral doors instead of the present central one; and a deep gallery where the organ formerly stood, and the substitution of the new screen and gallery, shown in the view; also a general rearrangement, so that now the organ is in a new side gallery, whilst the manual is close to the nuns' stalls. By this rearrangement seats have been obtained for twenty-five more students from the high-class school conducted by the nuns. Special care had to be taken not to interfere with the consecration crosses on the side walls, which would have entailed a fresh consecration; and it was, therefore, necessary to arrange the bays of the upper part of the stalls quite irrespectively of the width of the stalls themselves. The effect is more perceptible on paper than in the actual work.

SEMI-DETACHED HOUSES, BELFAST.

THESE houses have just been completed in the north of Ireland. The exterior treatment of the walls is in local red-facing brick, with some of the upper portions in plaster work, the roofs being covered with Ruabon red tiles. Mr. F. E. Ward, A.R.I.B.A., of Belfast, was the architect, the contractor for the work being Mr. Robert Corry, of the same city.

ST. PHILIP'S CHURCH, STEPNEY: DETAIL OF CHOIR ARCADE.

THERE is no more to add to our previous description of this church when giving, during the past few weeks, the plan, views, and general drawings of the buildings. This sheet is a copy of one of the architect's working plans, and it shows the arcade in the choir, the choir aisle, and the transepts, to which is added a plan through the passage of the triforium. A reference to the general plan of the church will enable the reader to follow these details more correctly. It was given in the BUILDING NEWS on December 2. Mr. Arthur Cawston is the architect.

ST. SAVIOUR'S CHURCH, WESTON-SUPER-MARE.

THE first portion of this church, now completed, was recently opened by Bishop Bromby. The

external walls are of local limestone with freestone dressings. The interior (except the chancel, which is cased with freestone) is lined with buff bricks, with Bath stone dressings and red rubbers for bands and vousoirs of arches. The shafts of the arcade columns are of red Mansfield stone. The church, when completed, will provide seats for about 300 persons. The designs, which were selected in competition, are by Mr. Sydney J. Wilde, architect, of Weston-super-Mare.

CAST-IRON MANTELPIECES BY THE COALBROOKDALE IRON COMPANY.

ALFRED STEVENS did many things besides the Wellington Monument and the decorations at Dorchester House. Time was when he was glad to be employed by manufacturers to furnish designs and models for articles of domestic use, and it is hardly sufficiently well known how many such articles he enriched with his genius. The Coalbrookdale Company were early alive to the beauty of his work, and they possess the models of the only two fireplaces he ever is known to have modelled for reproduction—of course, leaving out of the question the Stevens Fireplace at Dorchester House. We have deemed it likely to be of interest that we should illustrate these two fireplaces; the figure one is especially characteristic of the "Master." We have also added two little interiors in good style by Mr. Faulkner-Armitage, made by the same firm of manufacturers, which are good specimens of modern work to current taste.

CHIPS.

A large collection of weapons and armour has been bequeathed to the Artillery Museum at Paris by the late Col. Lichtenstein.

The Royal Victoria Hospital at Bournemouth, which was opened in January, 1890, has just been enlarged by a wing providing six additional beds, making thirty-one in all. The architects were Messrs. Creeke and Gifford, of Bournemouth. The new wing was opened by the Duke of Connaught on Monday. We illustrated the hospital in our issue of Jan. 17, 1890.

The Flintshire County Council have decided to co-operate with the Cheshire County Council and the River Dee Conservancy Board in erecting a bridge over the Dee at Queensferry, Hawarden, and to contribute £5,000 towards the estimated cost of £13,000.

The redecoration of St. James's Lower Hall, for Messrs. Moore and Burgess, has been intrusted to Messrs. Campbell Smith and Co., of Newman-street, W.

The Bibliothèque Nationale, Paris, has acquired a manuscript treatise on architecture in six chapters by Jean Goujon.

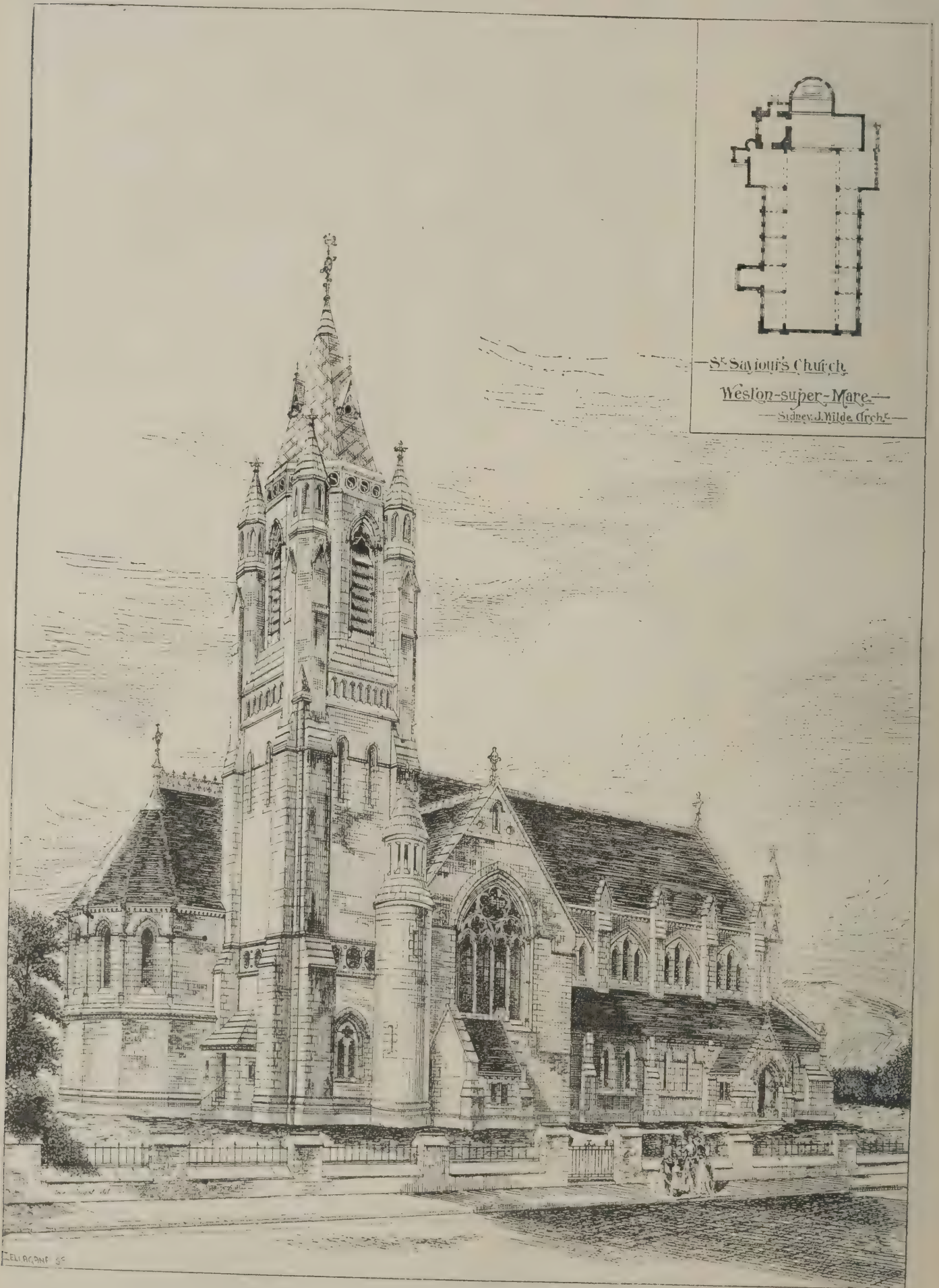
Dr. William Dorpfeld, the principal of the German Archaeological Institute at Athens, has resumed his excavations on the south-west side of the Acropolis, with the aim to trace the celebrated fountain of Kallirrhoe.

A white marble monument has been sent to Spain to be erected over the tomb of the late Mr. E. A. Freeman. It bears an inscription, "To the pious memory of Edward Augustus Freeman, who enshrined in letters for all time the early history of England, the Norman Conquest, and the destinies of Sicily. Fired with a zeal for topographical research, he was struck down in the midst of a journey in Spain by sudden sickness, and died there March 16th, 1892."

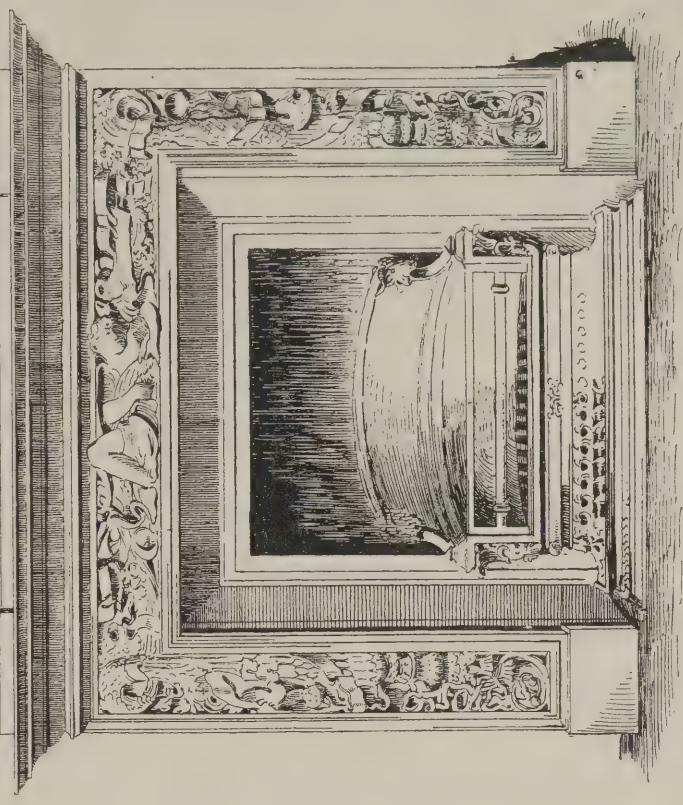
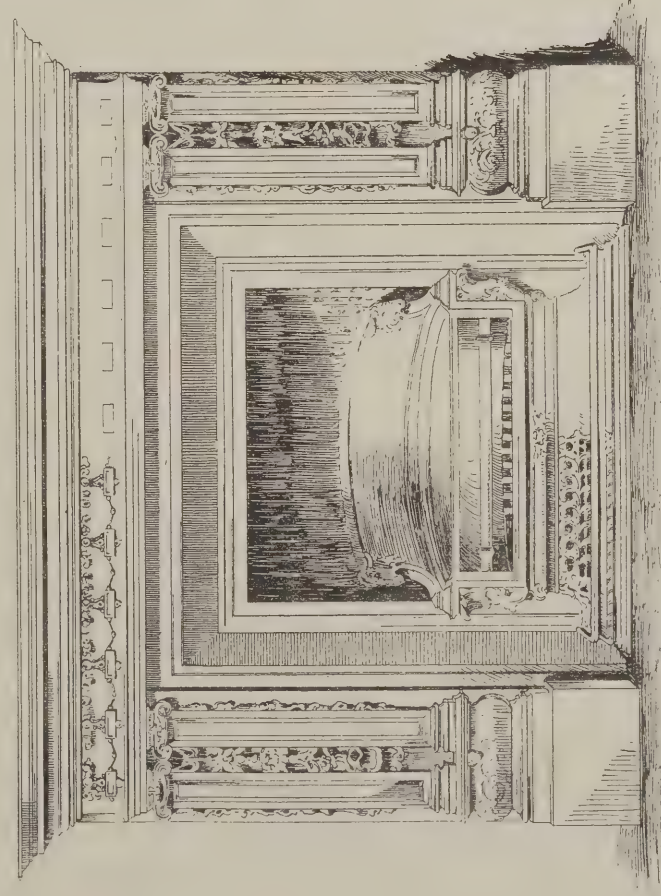
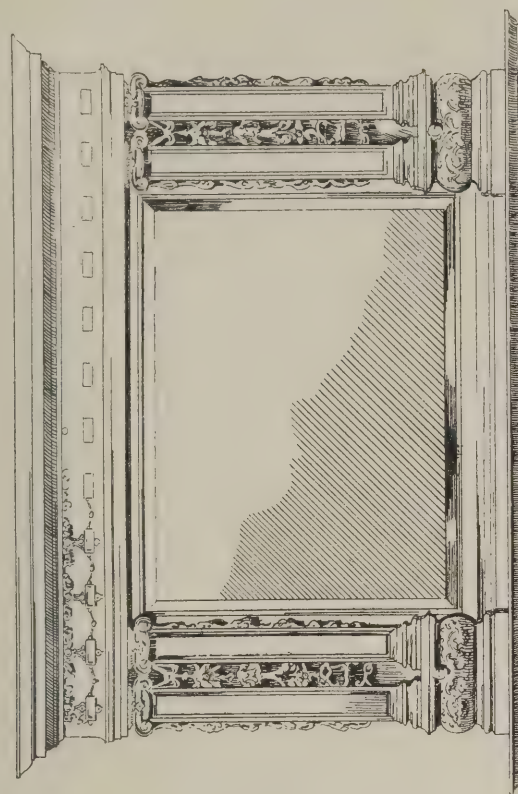
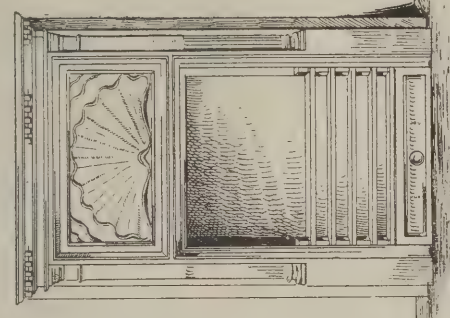
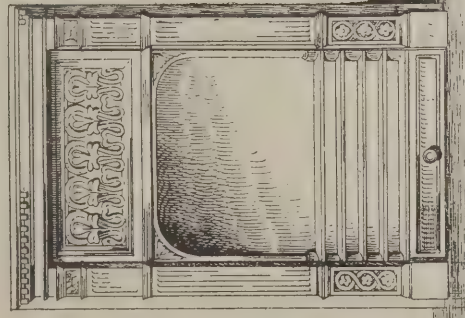
An Edinburgh firm of silversmiths has just executed, from designs by Mr. John Hutchison, R.S.A., a set of communion plate as a memorial gift to St. Salvador's Church, St. Andrew's (the College Church), by one of its members. The service, consisting of a massive flagon, two cups, and a paten, is in the Early Seventeenth Century style of work, with something of the feeling superadded of the Gothic form of the fifteenth century. Each piece is octagonal in form throughout, except the cups, which pass into the round at the lip.

In order to comply with the requirements of the town council of Leeds, the Theatre Royal in that town is about to be altered and provided with new dressing-rooms and green-rooms. Mr. Fowler, of Leeds, is the architect, and the estimated outlay is £2,000.

The Manx Tynwald Court, at its meeting on Friday, granted leave to the Douglas Town Commissioners to borrow £50,000 for the purpose of the town improvement scheme, which deals with the reconstruction of the old part of the town, pulling down a great deal of insanitary property, and erecting artisans' dwellings. The Ramsey Town Commissioners obtained leave to borrow £3,000 to complete their sewerage scheme.



CAST-IRON MANTELPIECES MADE BY THE COALBROOKDALE IRON COY FROM DESIGNS BY THE LATE ALFRED STEVENS & OTHERS



DELLAGANA S.

E. Chancellor Del.

WAYSIDE NOTES.

IN a column of "ecclesiastical intelligence" in the *Morning Post* of Monday were several items of news interesting to architects. First, as to St. Helen's, Bishopsgate, the work of restoration under Mr. Pearson's direction is now well advanced, but subscriptions are required for the completion of the scheme. A donation of £1,500 towards the fund has been offered on condition that the remaining £1,700 is immediately raised by the rector and churchwardens. Then we learn that the roof of old Arundel Church, *temp.* 1380, has become so honeycombed by the ravages of some insect as to be in a dangerous state, so much so, that it must be replaced. Next it is proposed to rebuild the nave and tower of St. Mary's, Harlow; while a proposal is under consideration for the complete rearrangement of the interior of the parish church of Great Baddow, Essex, the scheme including the removal of the galleries, the rearrangement of seats, the provision of a choir vestry, and "other improvements" at a cost of £1,000.

Lord Meath, as chairman of the Metropolitan Public Garden Association, has done much to improve the condition of London in respect to its open spaces. In his lordship's letter to the *Standard* of Wednesday is set down the nature of the work accomplished by this Association. During the past summer the Association completed and opened to the public no less than seven grounds, including important churchyards like Soho and Spitalfields, thus directly adding nearly six acres to the open spaces of London. In nine years over 70 grounds, scattered all over the metropolis, have, through the instrumentality of the Association, been thrown open to the public. Appeals for assistance to lay out the closed portion of Hackney churchyard, Woolwich parish churchyard, St. Thomas-square, Hackney, and a playground in Kentish Town, have been received. If these undertakings are proceeded with, now is the time for action, that the grounds may be ready for the enjoyment of for the people in the ensuing summer. In his appeal for donations to a good work Lord Meath need not have made any apology. The public authorities he refers to prefer apparently amusing themselves with trying experiments and making airy schemes. The real work in the way of securing open spaces among crowded populations has been done by the Metropolitan Public Gardens Association.

Further estimates in connection with the Asylum at Claybury were before the County Council on Tuesday, and they show the enormous scale upon which the building has been arranged. A sum of £17,500 had been provided for the electric lighting of the asylum. This in itself is considerable; but a further amount being required, the Council have sanctioned additional expenditure on this item of the works at Woodford Bridge.

Respecting the recent accident with a derrick at the corner of Ludgate-hill, Messrs. Ransomes and Rapier, of Ipswich, write to the *Times* of Wednesday, suggesting that steel-wire rope should be employed in place of the chain that controls the radiating power of the jib of the derrick. A jib of 50ft. or 60ft. weighs some two tons, and is usually raised and lowered by a chain. Chains, say the writers, are not reliable for such purposes, a chain lifting ten tons one day having been known to break next day with only a two-ton load. The steel-wire rope being composed of many strands, when one strand breaks it "frays out" and thus gives timely warning long before a point of danger is reached. A pair of ropes, each strong enough to do the whole working duty are recommended, and as steel wire ropes are relatively inexpensive to purchase, a working factor of ten or twenty times the safe limit of strain can be adopted. Seeing how wide is now the use of the steam Scotch derrick in London, this is a point deserving the attention not only of builders and contractors, but of those authorities having the care of the public using the highway in their charge. Derricks always look dangerous, and, as frequent sharp reminders prove, are in reality so, unless every precaution is taken to prevent an accident either from instability of the stagings on which they are erected, or from failure in some part of the machinery or gear. The Ludgate-hill accident very nearly proved of a most

disastrous character. To prevent the realisation of what might here have been possible, active measures should be taken. It is the duty of the London County Council to look after the safety of the public from accidents arising from building works in the street, and the Council may be losing sight of this, its duty, while occupied with the inauguration of municipal building schemes which nobody fancies, and which may prove an expensive experiment for the ratepayer.

Returning from a few days in the provinces, I have to burrow my way through the shoal of Xmas almanacs already coming to hand. Two beauties I have at once displayed. One—a calendar of the movable order—occupies a commanding position on the mantel-shelf, and having much silver lettering, and being withal of shield-like outline, presents an imposing appearance. The other is prepared more on the principle of quantity as against quality, and as temporarily hung blocks up a little of the view of Wales in my renowned map, so that it being impossible to see Pembrokeshire, in the event of my receiving a wire to build a cathedral in any town of that westerly corner of the Principality, I should be unable to locate the spot at a glance. The obstruction, therefore, cannot permanently remain; so either it must be destroyed, like Carthage, or I must call upon the generous donors to remove the bauble, in correct and Cromwell-like manner. What other blessings may be in store this festive season remains to be seen. Certainly the manufacturers are this year very thoughtful and considerate. With the silvered shield there came to hand a brass-headed nail of great tonnage, which, though scarcely of the tenpenny order, yet is a cousin-german thereto. Furthermore, the other day arrived a substantial, well-varnished card of divers goods and chattels, and with it a wall-hook for convenience of attachment to walls.

I have had a run in the Shropshire district, visited by the Architectural Association last year, and although Friday afternoon till Tuesday evening would, of course, not enable me to see all the places visited during that excursion, we yet managed to get in a ramble over the Wrekin from Welling to Buildwas Abbey, and so on to Much Wenlock, which, if I remember rightly, the Association excursionists—so far as concerns the Wrekin—had to forego from stress of weather. It is, perhaps, not inconsistent in our latter-day British climate, that where the rain spoiled a trip in August, in mid-winter we had dry, balmy, and bright weather, with a sun shining on the wide-spread Salopian levels, as seen from the dark head of the noble Wrekin. Beautiful Buildwas and grand old Much Wenlock Priory came in for examination—ruins deserving all the enthusiasm that their contemplation provokes. Ludlow we duly inspected and found its renowned castle all too beautiful for a short visit; nevertheless, personally speaking, I have a very clear recollection of its bold architecture, its great keep, banqueting-hall and kitchen, its beautiful entrance doorway from the great green square, and the grand old timber that still surrounds the walls. Of Stokesay I cannot say sufficient to impress the reader. Nothing pleased us better, and I should only like to see the old castle again when, in place of the wintry background of sombre purple hills, the grey stone walls would rise above masses of pink-and-white apple-blossoms in the surrounding orchards. Another feature of our outing—not, I believe, included in the Association programme—was a fifteen-mile trudge from Church Stretton, over the lonely Longmynd moors and the rugged rocks of the frowning Stiperstones, to the village of Minsterley. The Shrewsbury black-and-white houses I saw and admired in a respectful way, as I have at another time admired the old Domestic architecture at Chester, without, however, the least desire to imitate either the one or the other. Shrewsbury architects have been of another mind: there are several very good modern street fronts in the old black-and-white style. To judge, however, from works in progress, the style is not at the present moment in fashion at Shrewsbury.

A Right Merrie Christmastide to all, from
GOTH.

Professor J. Henry Middleton, F.R.I.B.A., of King's College, Cambridge, and Cheltenham, married at the British Embassy, Rome, on Saturday, the daughter of Mr. W. J. Stillman, of that city.

OPERATIVE PAINTERS' CONFERENCE.

FOR the furtherance of technical education in the painting trade, a united conference of masters and workmen has been arranged to be held in Painter Stainers' Hall, Little Trinity-lane, E.C., on Monday, Tuesday, and Wednesday, January 16, 17, and 18. A strong organising committee has been formed, with Mr. W. G. Sutherland, of Manchester, as chairman; Mr. William Foulness, of the Technical Schools, Finsbury, as treasurer; and Mr. George Kilpack, the president of the affiliate Societies of Operative Painters, is hon. secretary. The meetings will begin each evening at half past five o'clock. On the first evening, papers will be read on "The need of better and more Systematic Training on the part of Members of the Trade," by Mr. W. G. Sutherland; "How Best to Stimulate an Interest in our Trade on the part of the Young," by Thos. Lough, M.P., and Mr. W. A. Steward; and "Is it Desirable to Revive the Apprenticeship System," by James Clarke, Edinburgh. On the Tuesday evening, Lieut.-Col. Robert J. Bennett, Glasgow, will deliver an address; and a discussion on "Trade Classes and their Management" will be introduced by Messrs. T. G. Millis, M.I.M.E., and Wm. Fourniss; to be followed by one on "Is it desirable to Establish a System of Registration or Enrolment, and to Grant Diplomas of Ability?" introduced by Mr. Geo. Kilpack. On the Wednesday evening, Mr. J. D. Crace will preside and deliver an address; after which some proposals for establishing a new organisation will be introduced by Mr. A. Chappell.

OBITUARY.

Mr. John Haggard, for more than forty-two years one of the officials at the Museum of Geology, died at his residence in Fulham, on Friday, in his 80th year.

Mr. Alfred Fryer, of Wilmslow, who died on the 13th inst., aged 62 years, was the inventor of the well-known destructor for the burning of town refuse. His papers on "The Influence of Forests on Rainfall" awakened popular interest in the subject, and resulted in the systematic preservation of trees in the West Indies.

The death took place on Wednesday week of Mr. Lyons Wright, C.E., many years engineer and manager of the Corporation Waterworks at Wolverhampton. The deceased gentleman was a native of Hull, and after being engaged in Manchester, went to Wolverhampton 30 years ago as engineer to the Waterworks Company, and on the concern being acquired by the Corporation he retained his position until last June, when he retired, and was appointed consulting engineer. Under his management the waterworks system was extensively developed. The late Mr. Wright was regarded as a very energetic servant of the Corporation, never having had a day's holiday. He was a prominent Freemason, and also an ardent amateur photographer. He had been a widower for many years, and has left an only daughter. He was in his 69th year.

Mr. Dobell, of Exeter, has been instructed to prepare plans for converting the town-hall at Crediton into public rooms and a home for the District Constitutional Club.

Among the Volunteer officers of senior rank in the Home District to whom the decoration just granted by her Majesty for long service and efficiency was presented by the Duke of Cambridge on Monday were Sir Frederic Leighton, P.R.A., Hon. Colonel of the 20th Middlesex Artists' Corps, and Col. R. W. Edis, F.S.A., who commands that corps.

Henry Stubbs, a contractor, of Lambeth, was charged at the Guildhall, on Friday, with gross cruelty to a horse by causing it to be worked whilst lame. Stubbs had been previously convicted, and fined the full penalty, for cruelty to horses. Sir Andrew Lusk sentenced the defendant to prison for one month with hard labour, but notice of appeal was given.

Messrs. Maxwell and Take, of Manchester, report satisfactory progress with the erection of the Blackpool Tower, which is now completed up to 55ft., and three of the pillars are fixed up to 85ft. high. Up to the 10th of December 785 tons of iron and steel had actually been erected. It is possible now to form an idea of the appearance of the circus underneath the tower. This room will be 110ft. square, and between 40ft. and 50ft. high.

DRAINING AND PLUMBING SPECIFICATION.—III.

By ARTHUR BAKER, F.R.I.B.A.

VENTILATING PIPES.

103. **SIZE OF VENT-PIPES.**—Ventilating pipes, unless otherwise described, to be the full bore of the pipe which they ventilate.

104. **Main anti-siphonage pipe:—**

Provide and fix to the branch pipe of the lowest w.c. or slop closet a in. lead anti-siphonage pipe, and connect ditto with soil-pipe ventilating pipe at a height of 12in. above the top of the basin of the highest fitting, and connect all anti-siphonage pipes from fittings with this pipe. (See Fig. 21. See also Clause .)

105. **Anti-siphonage pipe to branch soil and other pipes:—**

Anti-siphonage (or vent-pipe) to branch soil, sink, or other pipes to be fixed near the outgo of trap, and to be slightly bent at the junction in the reverse direction to the flow of the water (see Fig. 21), and connect ditto with main

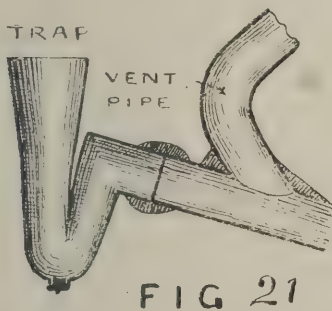


FIG. 21

anti-siphonage pipe above the level of the top of fittings. Anti-siphonage pipe to branch soil-pipe must be connected with soil-pipe ventilating pipe, and not with bath or lavatory ventilating pipe, or vice versa.

106. **Cross-bars to vent-pipe:—**

Ventilating pipes carried through wall, unless otherwise specified, to be protected with strong cross copper wire cross-bars. (See Fig. 22.)



FIG. 22

107. **Soil-pipe vent-pipe:—**

The soil-pipe outlet ventilating pipe to be of the same bore as the soil-pipe, and to be 17b. lead, and to enter the soil-pipe 1ft. above the branch pipe of the highest w.c. or slop closet.

OR. The soil-pipe ventilating pipe to be inches greater diameter than the soil-pipe, and of 8lb. lead, and to enter the soil-pipe 1ft. above the branch pipe of the highest w.c. or slop closet. (The area of the ventilating pipe should be as nearly as possible equal to the combined area of the soil-pipe and the vent-pipe—for instance, a 4in. soil-pipe and 3in. vent-pipe would require a 5in. ventilating pipe at top of soil-pipe. The extra size of vent-pipe would be necessary only when a large number of closets have to be served and the soil-pipe is of a great height—say, exceeding 80ft.)

108. **Caps:—**

Provide and fix to top of outlet ventilating pipe a copper wire domical cap.

109. **Fixing vent-pipe to roof:—**

Do all necessary cutting away and making good for ventilating pipe to pass through roof, secure pipe to roof with No. galvanised-iron stays, put 5lb. lead apron to pipe passing through roof and to galvanised-iron stays, the pipe and the stays to be soldered to aprons.

110. **Vent-pipe carried above chimneys or roof:—**

Provide for carrying up the outlet ventilating

pipe to soil-pipe, and waste from bath and sinks, by the side of chimney to a height of above (or below) the top of the chimney, and in the position required by the architect, the pipe to be bent outwards at the top, as shown in Fig. 23.

OR. The outlet ventilating pipe to be carried up ft. above the (state here whether eaves,

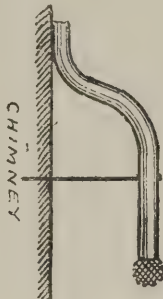


FIG. 23.



FIG. 24.

gutter, or ridge) of the roof, and to be fixed ft. distant from the dormer window or skylight.

111. **Size of anti-siphonage pipe to soil-pipe entering drain:—**

If the soil-pipe is not connected directly with an inspection chamber, and the drain into which it enters receives a discharge from a flushing tank or any large body of water, all the anti-siphonage pipes are to have a diameter in. greater than that shown on table (see Clause). This is necessary as a compensation for the loss of the air contained in the inspection chamber.

112. **Air inlet shaft:—**

Build where specified or shown on plan air-inlet shafts 12in. by 12in., with 9in. brick sides 2ft. 9in. high externally, and rendered internally with Portland cement. Cover ditto with a 2in. tooled York stone, and fix in one side a galvanised-iron barred grating, and paint ditto and connect shaft with inlet ventilating drain-pipe, which must be of in. diameter.

OR. Provide and fix at a in. 8lb. lead inlet ventilating pipe to a height of above floor of area, and connect at foot with bend of earthenware pipe, and put to ditto an open-balanced galvanised-iron fresh-air inlet cap, with mica cap of a pattern approved by architect. Protect pipe with casing. (When the inlet is an open space away from windows, the mica flap may be omitted. If these pipes are accessible from the road, or liable to be injured, they should be cased.)

113. *** Main anti-siphonage pipe to baths and sinks:—**

Provide and fix to the branch waste-pipe of the lowest bath or sink a 2in. lead anti-siphonage pipe, as specified in clause.

114. **† Vent-pipe to waste of baths and sinks:—**

Provide and fix to main waste from bath and sink, at a height of 1ft. above the branch waste of the highest bath or sink ‡ a in. vent-pipe.

115. **Anti-siphonage pipe to branch waste to pipes and sinks.**

§ Provide and fix to waste-pipe of baths and sinks anti-siphonage pipes of the same bore as the waste pipe, as specified in Clause , and connect with main vent at a height of 6in. above the top of the bath or sink.

OR. ¶ Provide and fix to waste-pipe of baths and sinks anti-siphonage pipes of the same bore as the waste-pipe, as specified in Clause , and carry through wall at a height of 6in. above the bath or sink, and put hinged brass flap to ditto.

116. **Vent-pipe to waste of flushing tank:—**

Put to waste from automatic flushing tank, about 12in. below the tank, a 2in. lead vent-pipe, and carry ditto to a height of 6in. above the top

* + This would apply to baths and sinks on different floors, fixed in tiers one above the other, or where the waste does not discharge into an open head.

‡ The size of the pipes must depend upon the number of baths and sinks which the waste-pipe has to serve.

§ This would apply to baths and sinks on different floors, fixed in tiers.

¶ This would apply to baths and sinks with waste discharging into open heads.

of the tank, and turn over ditto to right angles, and put cross copper wire in ditto.

OVERFLOW PIPES.

117. **Overflow pipes in sides of cisterns and lead-lined sinks*:—**

All overflow pipes from sides of cisterns and lead-lined sinks to be of at least double the sectional area of supply pipes, and the mouth of the pipe to be of such shape as to enable the water to run off as quickly as it enters, and to discharge with a fall of not less than 1 in 10 through wall into the open, and to be fixed with a light brass flap (see Clause); and in cases where the length of overflow exceeds ft., a proportionally increased area of overflow must be provided.

OR. Provide and fix in cistern and sink a lead stand-pipe overflow of at least double the sectional area of the supply pipe, and put trumpet-mouth to ditto, and fix over ditto a hollowed cover to ditto (see Fig. 24).

118. **Overflow carried through wall:—**

All overflow pipes and wastes from safes to be carried through external walls, and to project not less than 6in. beyond the face of the wall, and also 2in. beyond all cornices, sills, and other projections below the level of the overflow pipe.

119. **Ends of overflow pipes:—**

The ends of overflow and waste to safes to have light-hinged brass flaps, and the end of the pipe being cut at an angle of 60° with the lower sides. (When a back draught is not objectionable, these should be omitted, as they are liable to stick fast. Brass is specified as being less liable to stick than copper.)

120. **Overflow to sinks with plugged wastes:—**

Put to all sinks with plugged waste-pipes an overflow pipe (see Clause 102) carried through wall.

Lavatory overflows:—

See Lavatory Fittings in Part 4.

SERVICE PIPES.

121. **Size and weight of communication pipe:—**

The communication pipe to be of lead of the sizes and weights required by the Water Company, or, in case of private supply, of lead of not less than the following sizes and weights:—

3in.	5lb. per yard run.
4in.	6lb. "
5in.	7½lb. "
6in.	9lb. "
1in.	12lb. "
1½in.	16lb. "
1¾in.	21lb. "
2in.	28lb. "

122. **Depth of communication pipe below surface:—**

Underground communication pipes must be fixed at a depth of not less than 2ft. 6in. below the surface.

123. **Communication pipes inclosed in iron pipe:—**

Lead pipes laid underground or carried across open areas to be inclosed in galvanised iron pipes with red-lead joints. (This may rarely be required. The strength of the iron pipe must depend upon the object for which it is used. If the lead pipe requires to be protected from any heavy superincumbent weight, some precaution in addition to the iron pipe may be required.)

124. **Joints to communication pipe:—**

All lead communication pipes (Metropolitan Water Act, 1872) to have a wiped joint.

125. **Guard-box to stop-valve to communication pipe:—**

Provide and fix a guard-box to stop-valve outside the house.

126. **Size of service pipe to valve closets:—**

The lead service pipes to flushing rim valve w.c. apparatus to be of the following sizes:—

	Head of water.	Diam. of pipe.	Diam. of valve.
Under	3ft.	2½in.	2in.
"	5ft.	2in.	1½in.
"	10ft.	1½in.	1½in. or 1¼in.
"	15ft.	1¼in.	1¼in.
" and above 20ft.	1in.	1in.	

(If double closets are fixed on each floor, the

* It is impossible to specify the size, as this must depend upon the area of the service pipe and the pressure of the water. An oblong rectangular form is best fitted for the outlet of the overflow pipes from a cistern.

main service should be $\frac{3}{4}$ in. larger, and the branch pipes the same size as given above.)

127. Service pipes to wash down and other closets:—

Put lead supply pipe from water waste-preventer cistern to basin of wash-down closet, with flushing rim where direction of pipe is vertical and the head of water does not exceed 4ft. ($\frac{1}{2}$ in. is the most usual size, but some waste-water prevention cisterns require a larger and some a smaller pipe.)

OR. Put lead supply pipe from water waste-preventer cistern to basin of wash-down closet, with flushing rim where the direction of the pipe is at an angle of more than 30° and the head of water does not exceed 4ft. (The pipes should be increased in size in proportion to the inclination of the pipe, provided that the size is not greater than the waste water-preventer cistern and the w.c. basin require.)

OR. Put lead supply pipe from water waste-preventer cistern to basin of wash-down water-closet, with flushing rim if the head of water exceeds 4ft.

128. Size of pipes serving fittings on several floors:—

Provide and fix service pipes to sink, baths, &c., on different floors of the size given below, and put $\frac{3}{4}$ in. branch pipes to fittings on each floor. On ground floor, $\frac{3}{4}$ in. pipe; first floor, 1 in.; second floor, $1\frac{1}{2}$ in.; third floor, $1\frac{3}{4}$ in.; fourth and fifth floors, $1\frac{3}{4}$ in.; fifth and sixth floors, 2 in. This is necessary when the cistern has to supply fittings on each floor, in order that there may be a sufficient supply when several taps are open.

129. Direction of sewer pipe:—

All main and branch sewer pipes to be carried downwards in as direct a line as possible.

Lay on water with in. pipes to supply cistern. (The pipes to be of the following, say: High-pressure service, $\frac{3}{4}$ in.; low-pressure service, 1 in.)

Lay on water with in. pipes to water waste-preventer cistern. (High-pressure service, $\frac{3}{4}$ in.; low-pressure service, $\frac{1}{2}$ in.)

(N.B.—The water waste-preventer cistern should fill in not more than $\frac{1}{2}$ minute.)

130. Size of horizontal service pipe:—

If a horizontal length of service pipe is required between the cistern and its ascending portion, the horizontal pipe, together with its bends, and also a length of 6 in. of the vertical pipe, to be of an area 50 per cent. greater than

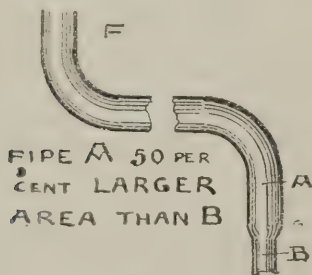


FIG. 25.

the vertical pipe, the outgo of cistern to be the same diameter as the horizontal pipe. (See Fig. 25.)

131. Position of unions to sewer pipe:—

The unions of sewer pipe to fittings to be placed in accessible positions.

TAPS AND OTHER FITTINGS.

132. Bosses to pipes:—

The bosses of pipes supplying sinks, lavatories, and other fittings, to be of sufficient length to allow of the cocks being easily screwed on.

ILFORD LOCAL BOARD OFFICES.

THE two designs selected by the assessor, Mr. G. T. Hine, for these offices are now on view. "Eureka," by Messrs. Clark and Hutchison, of 47, Strand, is placed first, and is a compact arrangement of offices. A central entrance, with committee-room on the left side and surveyor's offices on the other, with staircase hall at the back, forms the main block. The rate collector occupies the left wing next Oakfield-

road, and the sanitary office is behind it, with lobby for public. In the other corresponding wing we have a surveyor's second office and waiting-room behind. On the first floor, the board room is in front, facing the High-street, 40ft. by 20ft., and clerks' offices to left, with inquiry lobby. The other side of board room are the board's retiring and ante-rooms. The caretaker's house is on the west side. The design is balanced with hipped roofs, and clock tower in a Renaissance style. "Nab," by Messrs. Ben Woollard and Albert C. Bredon, of Finsbury-circus, gains the second prize. It is an artistically-drawn design in brick Renaissance. The collector and surveyors' offices are in front, approached by a wide corridor from behind, and committee and waiting rooms, plan, and sanitary offices in the rear; the staircase hall is spacious and well designed, leading to a board-room in front on the first floor, 35ft. by 20ft. in centre, with clerks' offices at the ends of corridor. The caretaker's rooms are on the second floor. The high tile roofs and gabled wings and the recessed board-room front make an architectural and pleasing elevation. The centre portion has pilasters between the mullioned windows of board-room. A pleasing coloured perspective is sent in.

CHIPS.

A painfully sudden death was witnessed in Manchester on Monday evening. Mr. William Kenyon Statham, aged sixty-three, builder and contractor, of 10, Brentwood, Eccles Old-road, Pendleton, was transacting business at 41, Corporation-street, in company with a Mr. Joseph Tiverton, of Ardwick, when he was heard to say, "I am going," and immediately expired. The deceased had been in ill-health for some time, and was medically attended a week ago.

At Mold, on Tuesday, Major-General Crozier, Local Government Board inspector, conducted an official inquiry as to the proposed sewerage scheme for the town of Mold, which has been estimated to cost £4,500. Mr. Radford, civil engineer, Nottingham, presented plans of the proposed scheme to the inspector, and no opposition was forthcoming. The inspector intimated that the necessity of a sewerage scheme went without saying.

The Bishop of Lichfield has appointed Mr. J. R. Veall, architect, of Wolverhampton, a diocesan surveyor under the Ecclesiastical Dilapidations Act, 1872.

The Prince of Wales, on Saturday, laid the foundation-stone of the new Clarence wing of St. Mary's Hospital, Paddington. Towards the £100,000 required to complete the extension, £48,000 has been obtained. One part of the buildings will be devoted to the purposes of a Nurses' Home, and another block will constitute the new out-patients' department. A third block will contain wards for the treatment of special diseases. Lying-in wards, a new administrative department, and accommodation for resident medical officers and students, will be provided.

Mr. S. M. Copeman and Mr. Rienzi Walton (Local Government Board inspectors) held an inquiry at Stratford-on-Avon last week relative to the application of the corporation for sanction to borrow an additional £4,000 to carry out extensions of the waterworks, £2,500 for the erection of an infectious diseases hospital, £370 for a fire station, and £480 in connection with an exchange of land for a public recreation ground.

The church of St. James's, Hill Top, West Bromwich, after undergoing a thorough cleaning, alteration of the interior, the removal of the organ and choir from the west gallery, the formation of a chancel, and being redecorated throughout, was reopened last week by the Bishop of Lichfield. The outlay has been £700.

At the last meeting of the Highway Board for Con Dover, the chairman said that at previous meetings of the board their newly-appointed surveyor, a Mr. E. H. Johnson, had been requested to find a bondsman for £300 and produce his testimonials from the Norfolk County Council. He had not yet done so, and the Finance Committee, who had gone into the matter fully, had passed the following resolution, which they recommended the board to adopt:—"That Mr. Johnson, not having complied with the conditions upon which he was appointed, this committee recommends that his services be dispensed with from this day, and that advertisements be immediately inserted in the local papers for his successor." A discussion followed, in which it was asserted that Mr. Johnson had been repeatedly asked to find security for the sum stated in the resolution, and also to produce his testimonials. He had not done so, and the committee had no alternative but to submit the foregoing resolution to the board. The resolution was unanimously adopted.

Building Intelligence.

AINSWORTH, LANC.—A new Methodist New Connexion chapel has been opened at Ainsworth. The walls are built of local stone, faced with Yorkshire parpinto, and dressings of Halifax stone. Internally the upper portion of the walls is finished in plaster, and the chapel has a waggon-headed ceiling, with moulded beams and cornices, the lower portions of the principals being exposed to view and resting on stone corbels. The organ-chamber and choir-stalls are separated from the vestries by panelled glass partitions, and the vestries and organ-chamber can be thrown into one large organ gallery for use on special occasions. The seats, dado, rostrum, and organ gallery front are of pitch-pine varnished. The church is lighted, and the premises are heated by hot water. The chapel affords accommodation for 200 persons. The works have been carried out from the designs of Mr. John Wynne, F.R.I.B.A., architect, of Manchester. Messrs. Robert Brooks and Sons, of Ainsworth, have been the contractors for the stonemasons' work; and Messrs. Yonng, Tinker, and Young, of Manchester, have been the contractors for the whole of the remaining trades, and have executed the joiners' work.

VAUXHALL, S.W.—A common lodging-house has just been erected at the cost of Lord Rowton in Bond-street, Vauxhall, from plans by Mr. Beeston. Sleeping and living accommodation is provided for 462 men. The building, which is of red and stock bricks relieved with Newbiggin stone of the same colour, laid in cement, is five stories in height. The floors are of concrete with steel joists, and the staircases of concrete, so as to render it as nearly as practicable fire-proof. It covers an area of 150ft. of frontage, by a depth of 105ft., and includes a yard, extending the whole length of the building, for out-of-door exercise. The walls of the passages and staircases are of white glazed bricks. Two dining-rooms, seated for 192 persons, occupy nearly the whole length of the building at the back, looking on the platform of Vauxhall Station. The walls of all the living-rooms are built dado high in chocolate and cream glazed brickwork with the wall above tinted a shade of terracotta. The sleeping apartments are heated by hot water pipes.

Engineering Notes.

WEST INDIA DOCK.—A new lock entrance is being made to the West India Dock, and will be opened in about twelve months' time. The contractors, Messrs. Lucas and Aird, commenced operations in September last. The lock, which will open into the Blackwall Basin, will be 430ft. in length, 60ft. wide, and 30ft. in depth, and the cuts leading from the basin to the Import and Export Docks will be increased in width and depth to the same dimensions. Pumping machinery will be provided for keeping up the depth of water to 25ft. The quays will be widened and be made suitable for movable cranes. The total outlay will be about £200,000.

Mr. Percy Wood has taken a cast of the late Sir Richard Owen's head, and he has been commissioned to execute a statue.

The time for depositing in the Private Bill Office of the House of Commons all Private Bills which will be promoted in the ensuing session of Parliament expired on Tuesday, when only 183 bills had been lodged. This number is the lowest on record during the last 20 years, the nearest approach to it being in 1887, when only 193 bills were deposited. Compared with last year, when 219 bills were lodged, the decrease is 36. Of the total number now deposited 144 relate to England and Wales, 25 to Scotland, and 14 to Ireland.

Messrs. Robert Boyle and Son, Limited, ventilating engineers, London and Glasgow, have been awarded a gold medal, the highest award at the International Exhibition, Kimberly, South Africa, for their latest improved patent self-acting air-pump ventilators and air inlets. The exhibition is ventilated throughout with air-pump ventilators. Messrs. Boyle's ventilating appliances are employed in most of the public buildings in South Africa, and are specified by the Imperial and Colonial Governments. Mr. Robert Boyle recently made a tour through South Africa, and agencies are established in the different colonies.

COMPETITIONS.

THE LONDON BOARD SCHOOL AT BROMLEY.—At the last meeting of the London School Board a long and animated discussion arose on the report of the Works Committee (summarised in our last issue, p. 860) as to the competition conditions for the school to be erected, from outside architects' plans, at Priory-grove, Bromley. An amendment to reject the report and continue the present plan of having schools planned and superintended by the permanent staff of the board received 20 votes to 20 votes against, and was lost by the chairman's casting vote. In a like manner (21 voting for and against) an amendment stating that "the board do not bind themselves to employ the successful architect in the erection of the school," was also defeated by the chairman's casting vote. Eventually it was decided to invite designs for a school for 1,200 instead of 800 children, and to add the words: "That the designs be accompanied by general specifications and reports showing system to be recommended for heating, ventilation, and drainage, also estimate of probable cost." To the recommendation "That three premiums of £150, £100, and £50 be awarded in the discretion of the assessor" was added the words "and that the sets of plans for which the premiums shall be awarded shall be the property of the board." As thus amended the committee's recommendations were finally adopted.

ILFORD.—The chosen design for the new public buildings at Ilford, comprising local board offices and a fire station, is by Messrs. Clark and Hutchinson, architects, 47, Strand, who are awarded the first premium of 50 guineas. The second prize of 25 guineas has been given to Messrs. Ben Woollard and Albert C. Breden, of Finsbury-circus. A review of the premiated designs appears on the preceding page. Mr. G. T. Hine was the professional referee.

RADCLIFFE, LANCs.—In response to an offer of premiums of £30, £20, and £10 respectively for the three most suitable plans for a technical school, the Radcliffe local board have received 50 sets of designs. They will be adjudicated upon by the board, assisted by an architect as assessor.

WALSALL BOARD SCHOOLS.—At the last meeting of the Walsall School Board, the plans of Messrs. Bailey and McConnal were adopted for the schools proposed to be erected at the Birch-hills. Mr. H. H. McConnal, A.R.I.B.A., of Walsall, is to be congratulated, for he has recently won the first premium for the Town Hall, the first premium for the Hilliary-street board schools, and the second premium for the public baths in the same town. A review of the plans for the Town Hall and baths appears elsewhere.

ARCHÆOLOGICAL.

NEWBATTLE ABBEY.—An important discovery has been made at Newbattle Abbey, Dalkeith, the seat of the Marquis of Lothian. Some workmen employed near the abbey house digging pits struck upon a piece of solid masonry, and the Marquis of Lothian gave orders to have the ground completely taken away from about the stonework, bringing to view the foundation of the north transept and side chancels of the old abbey. In 1878 extensive excavations were carried out near the same place, when the nave, aisles, and south transept were found, and by the present discovery the ground plan of the old abbey has been almost completed. All the foundations have been filled up again, and marked off with gravel surfaces. The north transept is 46ft. wide inside between the east and west walls, including the side chapels. From the inside of the north wall to the north aisle is 30ft. 9in., and the length of the main building from the great western door to the east end at the chancel is 293ft. 3in., whilst the width across the nave and aisles is 57ft. 1½in. The width from north to south transept, including the crossing, is 122ft. Newbattle Abbey was founded by the Cistercian Monks in 1140. Part of the old boundary wall near the river Esk has also been excavated and marked out. The work of excavation has been carried out under the superintendence of Mr. John Ramsay, clerk of works.

The Newbury Corporation resolved on Tuesday to apply to the Local Government Board for authority to borrow £30,350 to carry out a main drainage scheme in that borough, the engineer engaged being Mr. Austie.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—A meeting of the above association was held at the Birmingham and Midland Institute on Tuesday evening last, under the presidency of Mr. W. Hale, F.R.I.B.A. The formal business, which included the election of twelve new members, was followed by a paper on Rouen Cathedral, read by Mr. J. A. Grew, who, after giving a short description of the cathedral, proceeded to discuss closely the beauties of the exterior. Referring to the west façade, he pointed out that though almost entirely covered with varied and intricate ornament, the main lines and masses are so disposed as to lose none of their importance, and that as the visitor approaches the cathedral from the narrow street leading to the Place at its western end, it is not the ornament, but the finely-proportioned mass and imposing lines of construction which first attract his attention, and that though in places the work has been damaged in the lapse of time, yet new beauties have been added by the same cause, and the façade is still so nearly perfect in its beauty as to be beyond criticism. Having drawn attention to many special points of interest, Mr. Grew brought a very interesting paper to a close. A vote of thanks to Mr. Grew was proposed by Mr. Doubleday and supported by Mr. H. R. Lloyd, Mr. W. Hale, Mr. A. Harrison, and others, and a brief response from Mr. Grew terminated the proceedings.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At the last meeting of this association, Mr. T. Crichton Fulton, Glasgow, delivered a lecture on the "Electric-Lighting of Large Buildings." He explained in a popular manner the principles underlying the modern methods of generating electricity in large quantities by dynamical means, and showed how the essential conditions were applied in the construction of continuous-current dynamos. In speaking of the distribution of electricity, the lecturer described the circuit, and explained the use of switches. He also showed how loss was prevented and dangers averted by the proper insulation of all conductors, &c., and by the use of safety fuses; and gave point to his remarks by referring to a fire which occurred in London only the other day by the overheating of one of the wires. Mr. Fulton next referred to the work of the current, and explained how both arc and incandescent lamps are made and arranged, and how they work. In applying his remarks to various kinds of installations, he took occasion to emphasise how important it was that the machinery, upon which everything depends, should have plenty of space, light, and air, and should be kept scrupulously clean. He next went on to describe as typical installations a country house with water-power available, a factory in town with boiler-power and a steam engine, and a large church, with a gas-engine for its prime mover. In concluding, he dwelt on the propriety of having all work properly designed from the beginning, and thoroughly inspected and tested whilst in progress.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The members of this society held a "social evening" on Monday night in the Queen's Hotel, Leeds. There was a good attendance of members, to whom a capital programme of music was presented, arranged by Mr. T. H. Churton. At the opening of the concert Mr. G. B. Bulmer, the president, presented the silver medal of the society to Mr. Lindsay Grant for his drawings of ancient buildings.

At a meeting held in Leeds on Tuesday to consider what form the memorial to the late Canon Jackson should take, it was decided that the memorial take the form of a new wing for the Convalescent Home at Cookridge, to be called the "Edward Jackson Wing," the accommodation being for women and children. The total amount of subscriptions already promised is over £1,300.

A town clock for Gateshead, which has been erected in front of the town hall, was presented to the inhabitants of the borough on Tuesday by the mayor. The clock-tower is an exact *fac-simile* of the one placed at the end of Vauxhall Bridge-road, near Victoria-station, S.W., by the vestry of St. George's, Hanover-square. The tower is 25ft. high, and the total weight five tons. There are four dials, each 2ft. 6in. in diameter, made of copper figures, and glazed with opal glass for illumination. Messrs. Gillett and Johnson, of Croydon, supplied the clock and tower.

Correspondence.

WESTMINSTER ABBEY.

To the Editor of the BUILDING NEWS.

SIR,—Your correspondent "M." ought to blame the fifteenth-century architect for robbing us of the "original west doorway," not "the Wren"; and, at the same time, he coolly suggests that Mr. Pearson should rob us of Wren's work by rectifying the towers. I have more than once heard the remark that Wren added to these towers with "considerable success, considering that he hated Gothic," and this success, to my mind, is due to his working on his own lines. The upper windows of the towers show, it is said, that he had not caught the spirit of the Perpendicular work. Perhaps he did not want to catch the spirit. Why should he, living in the eighteenth century, try to design as they did in the fifteenth?

Personally I like these towers very much, the better for being able to say when they were added to by simply looking at them, instead of being puzzled as to what is genuine Perpendicular in the west front, as a future generation will be puzzled as to what is nineteenth-century work of the north transept.—I am, &c., C. F. M.

SIR,—Most of your readers must have noticed with satisfaction the spirit of tolerance and good taste which has uniformly characterised your remarks on subjects which are necessarily nearly related to theology. It is, therefore, with the greater regret that I see in your correspondence column a letter which cannot but outrage the feelings of a large number of individuals, and which is totally foreign to the purposes of a secular journal.

The communication from your correspondent who signs himself "M." is, so far as his architectural remarks go, quite unexceptionable, though we should be strongly inclined to doubt that the absence of lateral chapels was due to any comparative immunity from so-called "superstition." As a matter of fact, the existence of side chapels and side altars is abundantly manifest in the Abbey as now existing.

But when your correspondent proceeds to speak of the very fine Madonna and Child which adorns the entrance to the north transept, he speedily makes himself ridiculous. According to his reasoning, so far as we can make it out, a statue of the "old fisherman," as he is pleased to term St. Peter, would, regarded as a work of art, have been respectable, whereas a representation of Our Lord and His Mother is distinctly not so. A precious distinction indeed! We have yet to learn that Raphael's "Madonna" and Murillo's "Immaculate Conception" are lacking in respectability.

Seriously, Mr. Editor, is it not rather late in the day for this Puritanical homily, and are not your correspondent and the kindred spirit whose sacrilegious outrage he approves worthy successors of the iconoclasts who dissipated in a few years untold treasures of art, the fruit of ten centuries of faith and love?

With apologies for so trespassing on your space,
—I am, &c., ICON.
December 16.

VICARIOUS DESIGN.

SIR,—In the current number of the BUILDING NEWS you lead with an article on "Vicarious Design," on which, if you can spare the space, I should like to make a few remarks.

The writer says "when he" (the architect) "draws with his own hand the full-size profile of moulding on stone or wood" (why not on paper?) "we get pretty near to the directness of the sculptor's chisel or the painters' brush. The artist's ideal is actually brought to the material by this means, but the case is very different in practice. The eighth of an inch scale drawing is interpreted by the foreman or clerk of works; he enlarges it to a full-size drawing, and this, again, is handed to the mason or joiner who executes the work. The original is nearly lost in the translation; the moulding is quite another profile to that which the architect drew" (?), "or it is so distorted by bad drawing in the curves and members that he feels disgusted with it when he sees it."

And so he ought to feel disgusted, but with himself for shirking his work, and not doing that which he is paid to do; and, as a member of the

architectural profession, I cannot let this statement pass unchallenged.

I hope that none of the "laity" will read that article, or they will think that architects earn their commission very easily.

Fancy an architect drawing the eighth scale plans and getting out the specification and quantities, and then thinking he had finished his work! Why, he would only then have got ready to begin the most important part of it.

I have been in a few architects' offices, and not all small ones either, where I find the case to be very different in practice, for, as the majority of your readers know, it is usual for the architect or the assistant who has drawn or superintended the drawing of the plans of the particular building to draw with his own hand, not only all full-size details where required, but also all details of an intermediate scale—i.e., one inch to the foot, or so; the full-size drawings are handed to the contractor, whose yard foreman draws it out on wood for the carpenters, or has it cut out in zinc for the masons, or has a mould made if for plasterers, and so forth.

Such, Mr. Writer, is the case in practice, for how can an architect be said to draw the profile of a moulding to eighth scale? He may indicate that a string or cornice is going in at such a place, but that is all. I think, Sir, you will find that, although it be very pretty to write of art culture and art craftsmanship, yet to write of any art it is necessary to be acquainted with the *modus operandi* thereof, and I maintain that "Vicarious Design" in the sense of your article does not exist.

In my own case I must admit that I do draw some of the inch scale and full-size details, but they are all overlooked by the architect, and corrected and amended if necessary.—I am, &c.,
CLERK OF WORKS.

VENTILATION.

SIR,—I have perused in your latest issue the paper on ventilation read by Captain MacIlwaine at the Royal United Service Institution and Messrs. Robert Boyle's remarks thereon. The subject, especially at the present time, is, in view of the anticipated visitation of cholera, undoubtedly one of the highest importance, and too much attention cannot be drawn to it, as the health of the people and their capacity for warding off disease depend so much upon the proper ventilation of the public buildings they frequent, and also of their homes, though the efficient ventilation of drains, sewers, and soil-pipes is of equal importance. Not a moment should be lost in having everything done that is possible in this direction, so that we may be able to meet the advance of the fell scourge with comparative equanimity and safety. I have always taken the deepest interest in ventilation, and indeed have made the subject a special study practically as well as theoretically, and my experience has taught me that there is all the difference in the world between the one and the other, and that an ounce of practice is worth more than a ton of theory, however elaborately the theory may be worked out and to the satisfaction of the theorist. The authority quoted by Captain MacIlwaine for the statement that for the proper ventilation of a building 150 cubic feet of air per hour per head is required, and which is endorsed by Messrs. Boyle, is certainly much nearer the mark than another authority quoted, who fixes 3,000 cubic feet as the quantity that should be supplied: and yet both are in a certain sense right. The calculation of one is evidently based on the supposition that a system of ventilation is employed which prevents the products of respiration and exhalations from the body from accumulating, and draws them off as fast as they are generated, which Messrs. Boyle claim their system accomplishes. The other calculation is doubtless based on the assumption that plain open pipes, or other such contrivances, are employed, which do not at once and continuously withdraw the foul air as it is generated, but permit cold down draughts, which experience proves they almost invariably do, and which, as Captain MacIlwaine very correctly points out, press back the hot, vitiated air, precipitating the impurities and poisonous matter to be breathed over again. The 3,000 cubic feet per hour is simply, as I read it and understood it, employed for the purpose of diluting the air respired by an adult in that time—viz., 15 cubic feet, to reduce the excess of CO₂ thus created in the air to a healthy standard. This, however, is not ventilation, but merely

dilution—two very different things—by mixing a given quantity of foul air with a given quantity of fresh, so as to reduce the CO₂ contained in it to a fixed point. It is obvious that if the excess CO₂ is immediately removed as soon as formed by any method of ventilation, and a supply of fresh air admitted at a proper level, there will be no excess of CO₂ left in the air requiring dilution to any such extent, and therefore the 3000 cubic feet to be employed for that purpose would be quite unnecessary. I am at one with Captain MacIlwaine's authority and Messrs. Boyle when they state that with a proper system of ventilation 150 to 200 cubic feet per hour per head are sufficient for all ordinary requirements. In a large, crowded building, say Exeter Hall, if 3,000 cubic feet of air, or anything like that quantity, were provided for each person per hour, the draught would be so great that it would be impossible to occupy the building except at the greatest risk to health and total destruction to comfort. The remedy would be worse than the evil it was intended to cure. That is the objection to mechanical ventilation, which usually drives air into a building at such a high velocity that disagreeable draughts are experienced in the immediate vicinity of the inlets, whilst other parts of the buildings are left stuffy and unventilated, as the incoming columns of air usually travel in a direct line to the nearest outlet, and there make their escape. This is partly the cause of the complaints we so frequently read about in the daily papers respecting the failure of the mechanical ventilation at the new London Law Courts, and, so far as my experience goes, is a fair sample of mechanical ventilation generally, which is not only costly to install and maintain, but is unreliable and perpetually going wrong, either through the want of proper attention (which is seldom given) or owing to the mechanism breaking down or getting out of order. At its best, this system can only claim to ventilate a building when it is in operation—that is, for the few hours at a time that the place may be occupied, and for the rest of the time the ventilation is nil, when stuffiness and stagnation reign supreme. A method of artificial ventilation more objectionable still and dangerous to health is where the air-supply is forced through a water-spray, as it usually gets saturated with moisture to such an extent that if a handkerchief is held above the mouth of the inlets it may be found in a few minutes to be soaking wet. It can easily be imagined what the effect of this would be in a heated atmosphere, when the air would become steamy and oppressive, and more like a vapour bath than anything else. All forms of ventilation which depend for their action or efficiency on water are open to the fatal objection that in winter, when the water-pipes are frozen, they are rendered inoperative, and the ventilation is brought to a standstill.

My experience is that an automatic or natural system of ventilation is, in the long run, the most reliable and satisfactory, providing, of course, that properly-constructed ventilators are employed, and that they are skillfully applied by a competent engineer. I am quite aware that there are many very indifferent ventilators in existence, and also incompetent persons who style themselves ventilating engineers, and that automatic ventilation under such auspices might and probably would prove a failure; but, then, such ventilators and such engineers need not be employed.

One great advantage of the automatic system over a mechanical or artificial one is that it is always at work day and night, though some people have the idea—a mistaken one—that it is only when there is a breeze that this method of ventilation acts. Science, however, proves that there is not a moment of time but when there is a movement of the air, which is never stagnant, though it may seemingly be so, and that this movement properly utilised is sufficient at all times to change the air in a building and secure ventilation. I agree with Captain MacIlwaine, that it is wrong in principle and contrary to the laws of nature to attempt to withdraw the vitiated air from a building at the floor level, and no one having the slightest practical or scientific knowledge of the subject, or of the natural laws which govern ventilation, would ever advocate such a method. With respect to the so-called experiments with ventilators carried out about fourteen years ago by the Sanitary Institute, and known as the "Kew farce," it may be remembered by some of your readers that these experiments were instituted to determine the

relative values of three or four cowl which were shown at a sanitary exhibition, and which resulted in the fiasco described by the *Times*, which not only condemned the tests as worthless and proving nothing, but warned the Institute that if it desired to gain the confidence of the public it must be careful not to commit any more such blunders in the future. The extraordinary proceedings in question and conclusions arrived at, that an open pipe was the best and most reliable ventilator, so entirely contrary to all practical experience past and present, certainly tended at the time to injure the prospects of the Sanitary Institute, then newly formed, and to retard its advancement to the position it aimed at, to be recognised as an authority on sanitary questions. Most people, however, know from painful experience that it is no more conducive to health or comfort to sit under a down draught of cold air from an open pipe than it is to sit under a cold douche with the temperature below freezing-point. Such doctrines might, perhaps, have been accepted in the middle ages, but not now; and, as I have heard it expressed, the attempt to foist such ideas on the public is not only an impertinence, but an insult to the intelligence of the nineteenth century. Sir Douglas Galton, President of the Sanitary Institute, in condemning the open pipe as a reliable exhaust ventilator, only states the experience of all who have any practical knowledge of the ventilation of buildings—a very different thing from mere dilettante experiments carried out by three or four irresponsible individuals, themselves inventors of ventilating and sanitary appliances, for the purpose of deciding on the merits and passing judgment on the ventilating appliances of rival inventors and sanitary engineers. Certainly the taste displayed in the selection of such a jury might to some seem questionable, and it would perhaps have been wiser and inspired greater confidence in the public mind if the professional interests of the gentlemen who composed it had been different from those whose appliances they were judging, though in saying this it must not be inferred that I in any way question the *bona fides* of the transaction; but of what possible value to the public could these experiments be at the present day, even supposing they had proved anything at the time, seeing that the forms of the ventilators that were tested are now practically as extinct as the dodo?—I am, &c.,

CHARLES HOUGHTON, C.E.

London, December, 1892.

PLUMBING.

SIR,—I have to thank Mr. Baker for his kind reception of what he calls my criticisms, and I accept his invitation to continue them.

Mr. Baker agrees with me in the desirability of using small pipes, but suggests a few objections. I will take these objections seriatim, and shall, I think, be able to show them to be only imaginary. A bright, well-polished pipe may not be everything, but it is far and away the most important; if the inside of all the pipes be kept clean and bright, and this cannot be done without a free circuit of air, it follows that no objectionable matter can remain in them, and consequently there is nothing to evolve noxious vapours; the only point then left to look to is the exclusion from the drain of gas from the sewer.

As to siphonage, a 3in. soil-pipe will not siphon more readily than a 4in.; indeed, if one of the improved wash-down closets, which have 3½in. to 4in. outgo, be used, there is less chance of danger with a 3in. than with a 4in. pipe; besides which it is perfectly easy to render siphonage absolutely impossible, even without the use of "anti-siphonage" vent pipes.

I now come to his second objection. A small waste, with a perfectly clean water-way, unobstructed by any trap, and consequently running full bore, will allow more water to pass than a larger waste obstructed by a trap which acts as a considerable check on the discharge. A 1in. waste will discharge, under ordinary circumstances, about 24gal. per minute, and will therefore empty a lavatory in a few seconds, and a 1½in. waste will discharge about 70gal. per minute, which will empty a full bath in less than half a minute. An ordinary bath is fitted at the outgo with a brass grate pierced with six holes ½in. diameter, the total area of which amounts to 2½ circular inches, while a 1½in. pipe contains 2½ circular inches. These sizes are practically the same, and as the discharging capability of a pipe depends upon its smallest area, the discharge will not be increased by using a larger pipe,

while the efficiency of the flush is destroyed, as the larger pipe will not run full bore.

The illegal "regulations" of the vestries do not count when we are considering the best mode of sanitation, although, undoubtedly, we have sometimes in practice to do as they require, only to have to rectify their blunders later on.

I heartily endorse Mr. Baker's advice not to hastily adopt untested theories; but I would also add a strong word against the use of commonly accepted but obsolete methods (upon the use of which vestries endeavour to insist) upon the assumption that they are proved facts, whereas they are in many cases not only mere theories, but theories that, if carefully examined, would be proved fallacious. I refer to one in particular—the idea that the air will circulate in the pipes in a certain direction simply because a few arrows are marked on the drawing to show what way the air ought to flow.

In reply to "F. S. I.," in the case he mentions there is no necessity for any extraordinary precautions. The waste pipe should discharge over the R. W. head, and not be carried down into it; the R. W. pipe should, of course, be disconnected, with a shoe at the foot; the air then passes freely through the pipes, and there is no chance of either becoming foul. Brass flaps are not to be recommended any more than traps, as they close the end of the waste and prevent the free circulation through the pipe of air that is so necessary to secure a perfectly clean and sweet pipe. I can assure "F. S. I." that the plan I recommend I myself adopt with perfect success; but if he has any doubt, he can employ a wide R. W. head and discharge the waste into one end and connect the down pipe from the other—but let him see that the head has a good and clean fall from the waste to the down pipe.—I am, &c.,

BERNARD DICKSEE.

35, Queen Victoria-street, Dec. 19.

Intercommunication.

QUESTIONS.

[10915.]—**Leaky Roof.**—Can I make a good job if I cover a small slate roof of flat pitch with lead or zinc, the lead to lie directly on the slates without boarding? It is important that the slates be not removed? If possible, rolls should be dispensed with.—**PLUMBER.**

[10916.]—**Strains in Girders.**—Will some reader kindly refer me to some good book for the determination of strains in girders and bridges, &c., also say whom I may be likely to find to coach me (I mean whether school-master or specialist in any particular branch of study), as I am living in a town where it is taken up by nobody in class!—**STUDENT.**

[10917.]—**Warming by Steam.**—Can the upper part of a house be warmed from the ordinary kitchen boiler on the ground-floor by steam, hot water, &c.? Has it been done, and, if so, where? Is there a small book on the subject?—**THOS. SOFTLEY.**

[10918.]—**Levelling.**—In levelling along a road, if my B.M., to which I have to reduce my levels, is half-way along that road, and suppose I am told I am to pick up my B.M. as I worked my way along the road, and not to start on my B.M. and work up to the place I am to start my section from? How, in the former case, am I to obtain my first reduced level from that B.M.? If I have a section to make half a mile away from my B.M., do I start on my B.M. and work up by B.S.'s and F.S.'s, never minding intermediates, until I arrive at the starting place? Without using the prismoidal formulæ or tables, how would I compute the contents of a cutting, &c.? What scales would you prefer to use to plot a section, if you were at liberty to use any one you liked?—**SECTIONS.**

The president and council of the Royal Academy have elected Mr. Leonard Watts, of South Hampstead, to the Landseer Scholarship, value £40, tenable for two years.

At a meeting of the Gateshead School Board, held in their offices West-street, Gateshead, it was resolved that they appoint Mr. Geo. Bell, quantity surveyor, Collingwood-street, Newcastle, as independent quantity surveyor for their proposed new schools at Shipcote to accommodate 1,000 children, the cost not to exceed £7,000. Mr. Stephen Piper, M.S.A., of Newcastle, is the architect, his designs having been selected in competition.

At the Central Criminal Court on Tuesday, Thomas Dooby, formerly secretary of a branch of the Navvies' and Bricklayers' Union was indicted for publishing a defamatory libel concerning Arthur Humphry, secretary of the union. Defendant expressed his regret, and said the charges were unfounded. The Recorder ordered defendant to find a surety for £25, and to enter into recognisance for the same amount to come up for judgment if called upon within twelve months, and warned him that if the offence was repeated, he would be sent to prison.

Legal.

A TRIBUNAL OF ARBITRATION.

THE London Chamber of Commerce, acting with the Corporation of the City of London, have now established a London Chamber of Arbitration. This is in working order, with plenty of business waiting to be done. It is, of course, founded upon the same principle of the assent of the parties as gives jurisdiction to every case of private arbitration. This submission, signed by the disputants, is the basis of its power, and this forms an irrevocable contract between them to be bound by the award as a final settlement of their dispute without possibility of any appeal. But the importance of the step taken in providing this tribunal of arbitration lies practically in the fact that it brings what was formerly a matter of purely private arrangement in each special trade or business into full public view. The result should be, and doubtless will be, to encourage the method of settling disputes by arbitration, to the discouragement of litigation, with all its delay, costliness, and uncertainty. The London Chamber of Arbitration have issued rules, forms, and fees for the conduct of business. These are very plainly dealt with and explained in "A Guide to the Law and Practice of the London Chamber of Arbitration," written by Messrs. Shearman and Haycraft, barristers-at-law (London: Effingham Wilson and Co., price 2s. 6d.). The book at the same time explains very well and clearly the law as to arbitration and the processes of the High Court in regard to references, and to enforcing awards since the Act of 1889, which is given in full; the whole forming a handy and useful manual.

This general tribunal is primarily intended for the decision of commercial cases; and upon the roll of men who have consented to act as arbitrators will be found the best representatives of every kind of trade, and of every branch of business. The great thing wanting in an arbitration is that the disputants should have the most complete confidence in the court, whose award is to be final. It is here that judges and juries have latterly failed to satisfy mercantile men; and it is for that reason mainly that business cases have gradually left the Law Courts to be disposed of by private arbitration. But though the new tribunal is primarily intended for commercial matters, it can be used for every possible dispute. Almost every contract made in the building trades contains a clause as to arbitration, and though usually the architect is appointed sole arbitrator, there are many cases in which this is left open. In these matters it would be perfectly possible to use the London Chamber of Arbitration, if the parties agreed so to do. The influence of the new tribunal will soon be felt in the way of simplifying and cheapening all arbitration proceedings, including those before surveyors. Here we are to have no meddlers, fuss, or formality; all the forms used are short, clear, and to the point. The fees are fixed low, being one guinea, as an office fee, including attendance of Registrar; and two guineas for the first hour, with one guinea per hour after that for each arbitrator or umpire, with no further fees in the award. The legal assessor is expensive, being put at £5 5s. for his attendance; but he can, and doubtless will, often be dispensed with, so that it will be perfectly possible to get a short dispute entered, heard, and decided finally by a single arbitrator for three guineas altogether.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

CONSTANT READER.—AGREEMENT.—NOTICE TO QUIT.—(1) The notice is sufficient under the agreement, and will expire on 28th March next. (2) He must make good all damages of the kind named. (3) Yes, if he stayed and paid rent it would be under the terms of the agreement as far as applicable to a yearly tenancy. (4) No, it is not essential that you should accept his notice to quit.

The Stourbridge Commissioners decided, at a private meeting on Saturday, to purchase the local gasworks from the company now owning the property. A loan of upwards of £120,000 has been negotiated for the purpose of carrying out the purchase.

LEGAL INTELLIGENCE.

IN RE W. BAKER.—At the Worcester County Court on Saturday, before Sir Richard Harington, William Baker, formerly carrying on business at Colwall as a builder, contractor, and farmer, who filed his petition on November 13, 1891, applied for his discharge in bankruptcy. The Official Receiver reported that a dividend of 5s. 4d. in the pound had been paid upon liabilities of £779 9s. 3d., that the failure had been brought about by a number of building speculations and insufficient capital. He further reported that he had within three months of his bankruptcy given an undue preference to his father-in-law.—The judge suspended the discharge for two years.

CHARGE AGAINST A BUILDER'S CLERK.—William Light, 42, a managing clerk, of Wandsworth-bridge-road, was charged at the Marylebone Police-court, on the 15th inst., with stealing £42, the money of William Seaman, builder, of 132, Ashmore-road, St. Peter's-park. According to the evidence, the prisoner was managing clerk in the prosecutor's service for two and a-half years, and was discharged in October last for neglecting his duties. Since then the books had been overhauled, and it had been discovered that cheques had been drawn for wages representing a larger amount than the sums actually paid.—Prisoner was committed for trial.

LOCAL BOARD SURVEYOR AND BUILDER.—In the Isle of Wight Bankruptcy Court, on Friday, the public examination took place of Joseph Chinchin, of East Cowes, builder and contractor, and surveyor to the East Cowes Local Board. Gross liabilities £2,333 7s. 9d.; expected to rank, £895 9s. 4d.; available assets, £696 11s.; deficiency, £198 18s. 4d. The debtor said he commenced business in 1875, having £25 capital. He entered into a contract with the Government last April twelvemonth to carry out for three years all necessary work at the Barracks at Parkhurst and Cowes. He took the work at 24 per cent. off the scheduled prices, 1½ per cent. lower than the previous contractor had tendered. He had lost on the contract. Being surveyor to the local board, he was unable to give personal attention to the contract work, and had to trust to men who were not scholars enough to look after his interests, the result being that wages were too high. The debtor passed his public examination.

IN RE W. SARGEANT, CLACTON-ON-SEA.—Wallace Sargeant, builder and contractor, of Clacton-on-Sea, whose statement shows unsecured liabilities £3,365 11s. 8d., with a deficiency of £2,667 5s. 10d., came up for his public examination on Friday. Debtor said that he was a practical carpenter and joiner, and eight years ago he went into business at Clacton as a builder, with a capital of £50. Since November, 1891, he had contracted nearly all his present debts, which were £4,700 (gross), the deficiency being £2,667. He expected to be able to pay from contracts in hand, on most of which, however, he made losses.—The examination was adjourned for the debtor to file an account showing how his deficiency has arisen.

CLAIM AND COUNTER-CLAIM.—PILE V. BOYERS.—This was an action brought by Mr. Thomas P. Pile, of the city of Dublin, builder, to recover a sum of £609 for improvements and alterations made to the house and shop premises, 22, North Earl-street, Dublin, for the defendants, who are a firm of drapers carrying on business in that city, and was heard by Mr. Justice Holmes and a special jury on Dec. 15 and 16. The defendants lodged £460 in court in full satisfaction of the plaintiff's claim, and counter-claimed for £600 for alleged defective workmanship and materials, and for delay in completion. In the course of the trial, which lasted two days, several witnesses were examined, and the evidence was of a conflicting character. In the result the jury found for the plaintiff for £42 over the amount lodged in court, and against the defendants on the counter-claim.

TRADE UNION RULES NOT BINDING ON EMPLOYERS.—Alfred Gaard, a builder, was summoned to the Highgate Police-court on Monday by a bricklayer named Love for wages said to be due. The complainant said he went to work at seven o'clock in the morning, went to breakfast at eight, and on his return was told by the defendant, "I shall not require you any longer." The complainant demanded an hour's pay beyond the hour he had worked, and produced the Operative Bricklayers' Union Rules in support of his demand. The Bench decided that the defendant was not bound by these Union rules, and dismissed the summons with costs.

AN EXPENSIVE BRICK.—A singular building case was heard before Mr. Lumley-Smith, Q.C., at the Shoreditch County Court, on Monday, the 19th inst., by which Henry Bamber, a cementer, sued Messrs. T. Boyce and Co., builders, of Eagle Works, Hackney-road, to recover £50, under the Employers' Liability Act, for injuries sustained through the negligence of defendants' servant. On the 4th of July the plaintiff was cementing on the basement floor of the Gainsborough Board Schools, Victoria-park, when, whilst stooping, a brick fell

from the scaffolding of the third story, which struck him in the loins and rendered him insensible. The brick fell 30ft. He was carried to the London Hospital, where he remained fourteen days, and could not work for seven weeks. Alfred Page, who carried the bricks, said one brick fell over. Three expert witnesses were called, who said that at such a height a double "guard-board" ought to have been placed on the scaffold to prevent the bricks falling over. The guard-board used was only 9in. high. For the defence, it was contended that two experts said that a 9in. guard-board was sufficient for such a height. His Honour said plaintiff had been guilty of gross exaggeration and misstatement in a letter he wrote to the firm demanding compensation, and he should only give him a verdict of £6.

THE BUILDERS AND THE FLORIST.—LIQUIDATED PENALTIES.—The case of J. W. Wyatt, of Crownhill, and B. Corber, of Egg Buckland, builders, against W. G. Hodge, F.R.H.S., florist and fruiterer, of George-street, for £20, balance due for work done and materials supplied in the erection of two greenhouses, came before the Devonport County Court on the 15th inst. The case was reported in our issue of the 2nd inst., p. 793. It appeared that the houses were to be built in a certain time, which had not been done. For the plaintiffs it was argued that the clause in the contract was a penalty clause, but the defendant submitted that he could claim liquidated damages. His Honour, in delivering judgment, said he had looked up the cases which were cited on both sides, and although it was argued that this was a penalty clause, it was in effect a liquidated agreement. The only point was, supposing he was wrong, whether the defendant had proved damages to the amount claimed, and he thought, assuming that the agreement was by way of a penalty, the damages had been proved. As to the defendant's delay in clearing away the ground for the erection of the greenhouses, thereby hindering the plaintiffs from carrying out their contract in the stipulated time, he found that there was no delay on the part of the defendant. He therefore gave judgment for the defendant with costs.

AN ARCHITECT'S CLAIM FOR FEES.—SWASH V. RAY AND GILMORE.—At Newport, Mon., county-court, on Thursday, the case of Swash v. Ray and Gilmore, which was heard at the last Court, and in which his honour Judge Owen gave judgment for the plaintiff on the claim for £12 odd, and on the counter-claim for the defendants. The case, which was reported in our issues of Nov. 18 and 25 ult., pp. 725 and 753, now came on again. His Honour said that the judgment was for a similar amount against each defendant. It was now agreed that judgment should be for £24 13s. against the joint defendants. An argument ensued as to how the amount of damages should be assessed. It appeared that there was no decision as to the point between architect and owner. Mr. Wallace, for defendants, said that it was likely the case would end in the House of Lords. His Honour advised the parties to come to terms, saying that the costs, if the case were carried to the higher courts, would amount to more than the costs of the original contract. Mr. Wallace said that the plaintiff had wrongfully given a certificate to the contractor, who had erected two houses for the defendants. The plans stipulated 14in. mullions, and the contractor put in only 9in. mullions. Mr. Wallace now contended that the measure of damages was the cost of taking down and rebuilding the bay windows, whilst Mr. Bailhache urged that the damage was the difference between the value of the house as erected with 9in. mullions to what it would have been had the 14in. mullions been put in. It was eventually agreed to refer the question of what was to be done to the houses to Mr. J. Thomas, Bristol city surveyor, the plaintiff agreeing to pay the costs of any alterations necessary. His Honour gave costs to the plaintiff on the claim, and costs to defendants on the counter-claim.

IN RE W. R. PARKER, CARDIFF.—The public examination in bankruptcy of Mr. W. R. Parker, contractor and ex-town councillor, of Cardiff and Penarth, commenced at the Town Hall, Cardiff, last week. The debtor said he had carried on business in Cardiff as a contractor for about eight or nine years, and had lived at Penarth. He had been in partnership with Mr. Pedrette since 1888, and previous to that he had been in partnership with Mr. Geen, of Newport. The heaviest contracts he had taken were the construction of the Ystradgynodwg and Rhondda main sewer. That was now completed, except for a few small matters. He made no money by the contract. A claim for extra work, amounting to £13,190, had been sent in, and had been disputed. The amount of work certified for the Rhondda sewer was £140,000. The firm now owed about £10,345. Mr. Thomas Pedrette, partner in the firm of W. R. Parker and Co., was also examined. He said he had been in partnership with Mr. Parker about four years, but he had not had anything to do with the Cardiff business, his share of the work being to manage the contracts at Reading and Wakefield. The examination was adjourned to the 6th of January.

Our Office Table.

THE London County Council decided on Tuesday not to sell the site for artisans' dwellings in Goldsmiths-row to the East-end Dwellings Company, but to take steps for carrying out their resolution of October to ask the permission of the Home Secretary for the Council to erect dwellings on the site. They also determined not to act with the Middlesex County Council with a view to the acquisition of Alexandra Park, as they considered the purchase-money demanded, £275,000, far too high. An application having been made by the Edinburgh Corporation that Mr. A. Young, the valuer to the council, should be allowed to go to Edinburgh to give evidence as to the tramways arbitration, it was resolved, after much discussion, to give Mr. Young permission to go on condition that he should not receive a fee.

Good progress is being made with the arrangements for a photographic survey of Warwickshire. The proposal is to collect a series of photographs of all the scenes and buildings of interest in the county, so that, should they hereafter be altered or effaced, it will be possible for future generations to see what they resembled in the second half of the 19th century. A strong committee of selection has been appointed, on which are included Mr. Jethro A. Cossins, a well-known Birmingham architect, and Mr. Whitworth Wallis, F.S.A., the curator of the Birmingham Fine Art Gallery, and the collection will be housed by the Birmingham corporation in their galleries. The idea seems to have "caught on" with the inhabitants of Warwickshire, for already the committee have arranged and exhibited at Birmingham some 500 of the interesting photographs received, and at a meeting of the committee held last week, the curator, Mr. James Simkins, announced that he had received and mounted a second series of 421 photographs, while 470 more from negatives actually taken had been promised. It was asserted that the next exhibition would be far superior in quality of work and interest to the one held last year. In connection with the survey record a portrait gallery of "Warwickshire Worthies" will be formed, to be added to at the rate of 50 names of local celebrities a year, and the first instalment of names has been agreed to. The success of the scheme is now so well assured that it is under consideration to make a similar photo-survey of the adjoining counties of Stafford and Worcester.

JAY GOULD is buried in the comparatively small marble mausoleum built for him several years since in a grass-covered knoll on Woodlawn Cemetery, New York City. The tomb was designed by Mr. E. T. FitzMahony, and is a lifeless reproduction of the *Maison Carré* at Nîmes—a hexastyle, peripteral Ionic temple. It is built of Westerby granite, and measures 33ft. by 22ft. and 20ft. in height to apex of roof. The cells are shut in by heavy bronze doors, and measures 20ft. by 70ft., and 13ft. high in the clear. Around the walls are the catacombs on either side. The floor is a single slab of marble, the internal walls are faced with polished pink and cream-coloured Tennessee marble, and the roof is a monolith of granite. At the rear of the cells is the only window, 6ft. by 3ft., which is filled with stained glass representing a choir of angels. The building is roofed with overlapping granite slabs, and the entire cost of the mausoleum was £16,000 sterling.

MR. CHARLES J. FERGUSON, F.S.A., of Carlisle, in a letter to the daily press, reminds us that the buildings of Millbank Prison, now in course of demolition, were the first of importance in England in which the modern use of concrete in foundations was adopted. He adds: The success which attended the use of this material at Millbank—though it was not until the foundations of two pentagons carried on piles had failed, that Sir Robert Smirke was called in and concrete was adopted—led to the more extensive use of concrete, and to the almost entire disuse of piling and planking, and gradually developed still further uses for concrete—a process that is still going on.

HERR ALWIN NIESKE, of Altharzberg, suggests a method for the preparation of an absolutely waterproof cement, consisting in the addition to ordinary cement of acetate or palmitate of

alumina. By further adding chromate of magnesia to this mixture, the cement is made refractory as well as moisture-repelling. The proportion of palmitate of alumina to be employed will vary according to circumstances, the nature of the mortar or cement, and the character of the work to be done; but 10 per cent. of the palmitate would be a good proportion for any kind of hydraulic mortar. If the cement is needed to resist humidity, and be at the same time refractory to fire, a mixture is made in about equal parts of the cement mortar with the palmitate and a chromic magnesia prepared with oxide of chromium, 32 to 42 parts; alumina, 18 to 22 parts; magnesia, 18 to 20 parts. The mixture of these earths, wetted with water, is formed into briquettes.

THE Lord Mayor has received at the Mansion House a deputation, who presented addresses from the corporations and plumbers of Glasgow and the West of Scotland, and those of Edinburgh and the East of Scotland. The documents, which were beautifully illuminated, contained congratulations to Mr. Alderman Stuart Knill on his accession to office, and conveyed the thanks of the signatories for his warm support of the movement for the national registration of plumbers. Hope was expressed that the Plumbers' Registration Bill might be entered on the Statute Book during his term of office.

In describing the exhibits at the Sanitary Museum at Highgate last week, we inadvertently omitted to mention the very instructive collection of sanitary appliances and fittings presented by Messrs. Hayward Tyler and Co., of Whitecross-street, E.C. The "full-flush valveless" closet, with ornamental basin, and the "elastic-valve" closets with flushing cistern and with flushing basin, are exceptionally good, and deserve the attention of architects and builders. One is fitted with "underseat" regulating valve and extra large outlet. The "Tylerox" pedestal wash-down closet, with waste-preventing cistern, and the examples of earthenware urinals and flushing cisterns, also the plumbers' fittings, are improvements which are well worth the inspection of every architect and builder who are anxious to specify or introduce the best workmanship.

For the preservation of ironwork from corrosion, tar-smoke painting is recommended by the French Marine Department, who have issued instructions. Tubular boilers, when not in use, are to be filled with water, to which a distinctly alkaline reaction has been imparted by a small quantity of lime or soda. The parts inaccessible by the brush are to be preserved by burning coal-tar under them, the smoke of which, condensing in the cold tubes, forms a protecting coating which prevents corrosion. The external parts can be painted with red-lead or coal-tar.

CHIPS.

The Legislative Council of South Australia passed, on Thursday in last week, the Bill authorising a loan of £1,016,000, to be employed mainly for railway construction and waterworks.

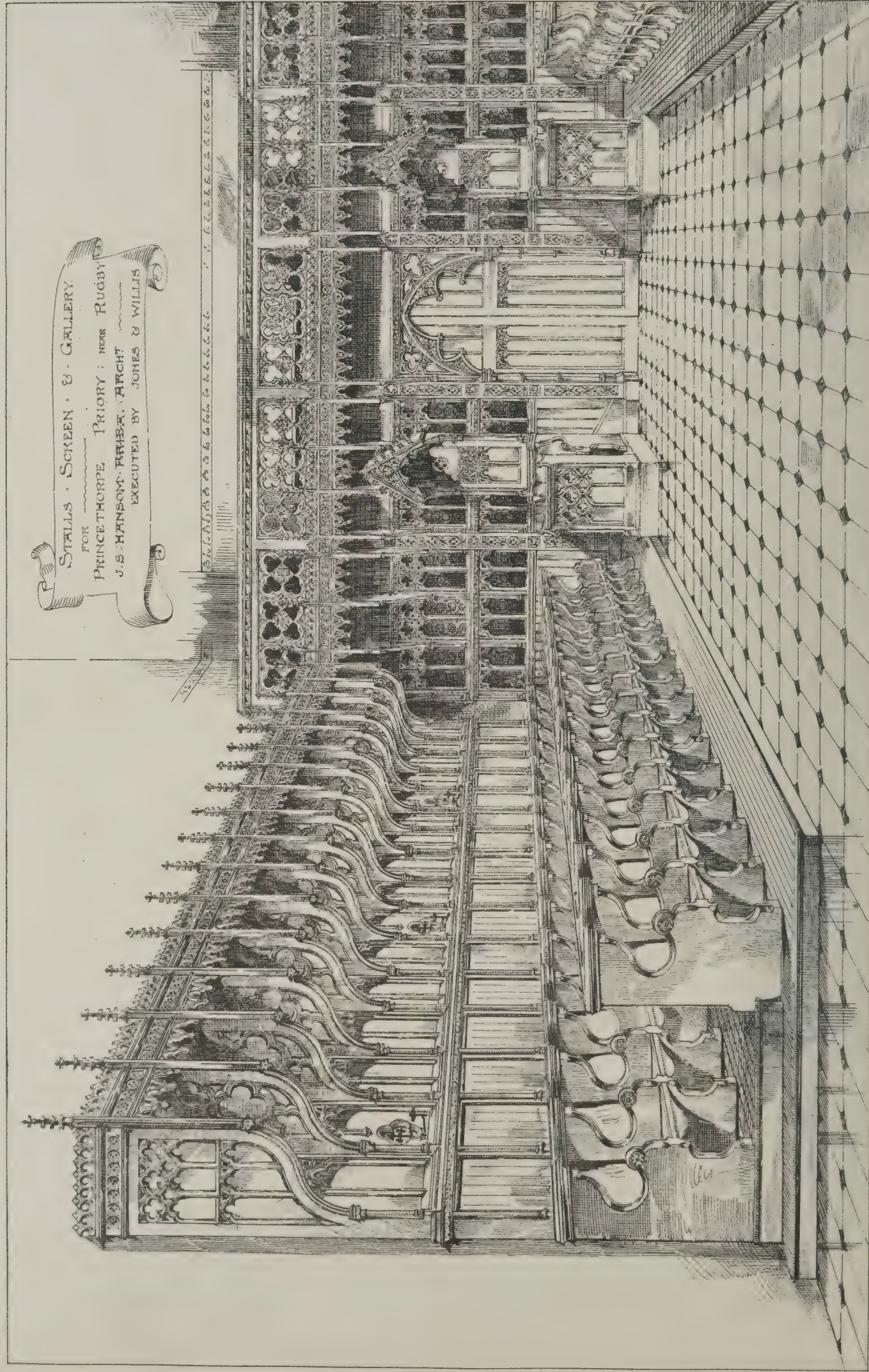
On Saturday several members of the Royal Family visited Paddington to take part in the ceremony of laying the foundation stone of the Clarence Memorial Wing of St. Mary's Hospital, the cost of which is estimated at £100,000. The new wing will bring up the accommodation of the hospital to 380 beds, and will contain a medical school and college.

The Chichester town council have adopted a scheme for the extension of the borough boundary to include the urban population that has sprung up without the area of the city. The scheme, if carried out, will add 3,204 to the population, and £3,386 to the rateable value.

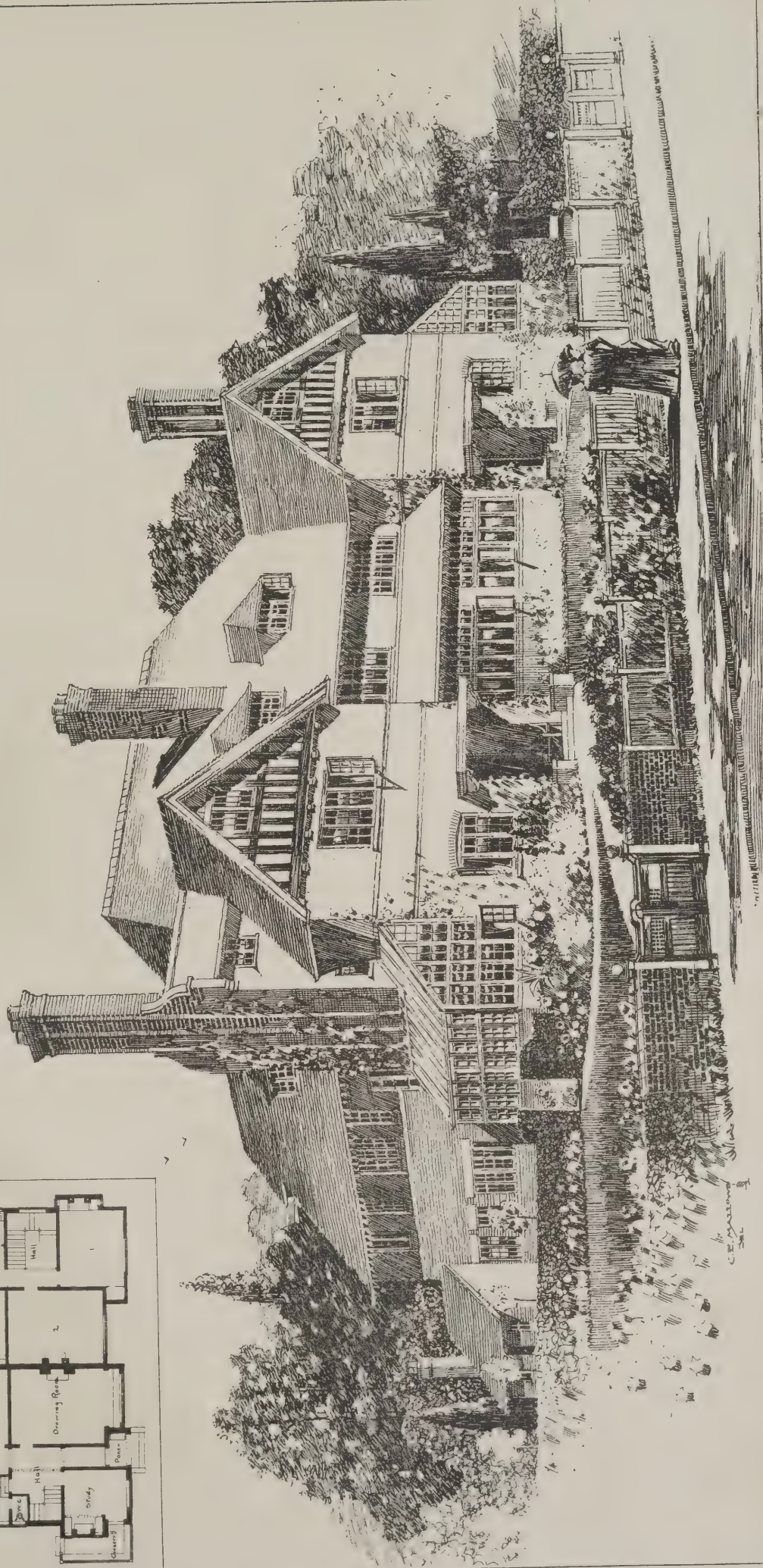
In our notices last week, *re* the opening of the University College, Liverpool, and the cathedral extension, Manchester, we omitted to mention that Mr. Geo. Wragge made and fixed the whole of the wrought iron casements for the former to Messrs. A. Waterhouse and Son's instructions, also the gun-metal casements used for the latter work.

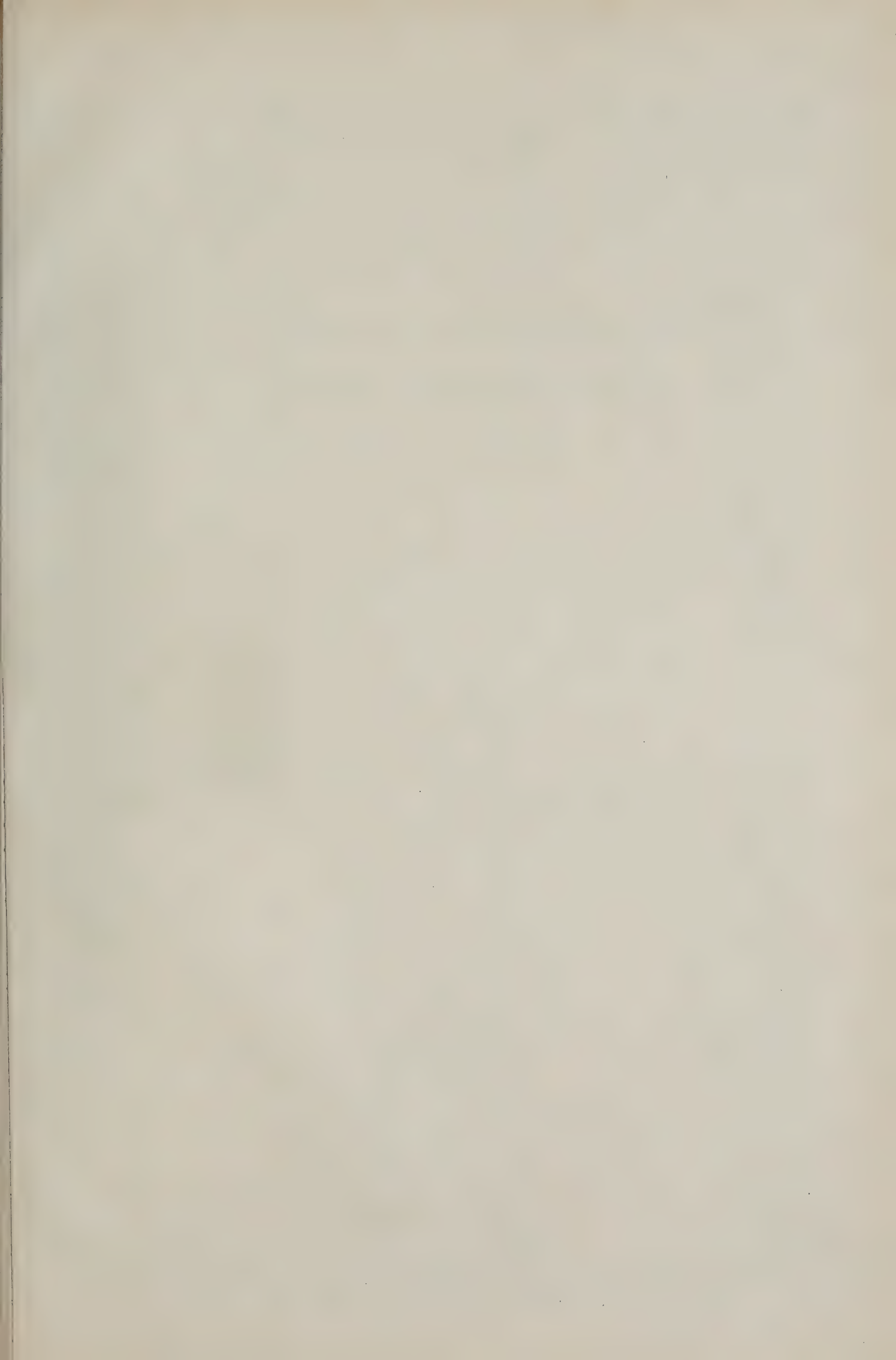
The infectious diseases hospital, Herne Bay, is being warmed and ventilated by means of Shorland's patent Manchester stoves and patent Manchester grates. For the extraction of the vitiated air, an outer metal casing is fixed round the outside of vertical smoke-pipe leaving space all round (*viz.* between the smoke-pipe and the outer casing); this forms a simple and excellent exhaust shaft for the vitiated air, and terminates just above the ridge of roof with one of Shorland's exhaust cowls. These warming and ventilating appliances are supplied by Mr. E. H. Shorland, of Manchester.

STALLS · SCREEN · & · GALLERY.
FOR
PRINCETHORPE PRIORY : NEAR RUGBY
J.S. HANSON. ARCHT.
EXECUTED BY JONES & WILLIS



SEMI-DETACHED HOUSES AT BELFAST. F. EDWARD WARD, ARCHT.

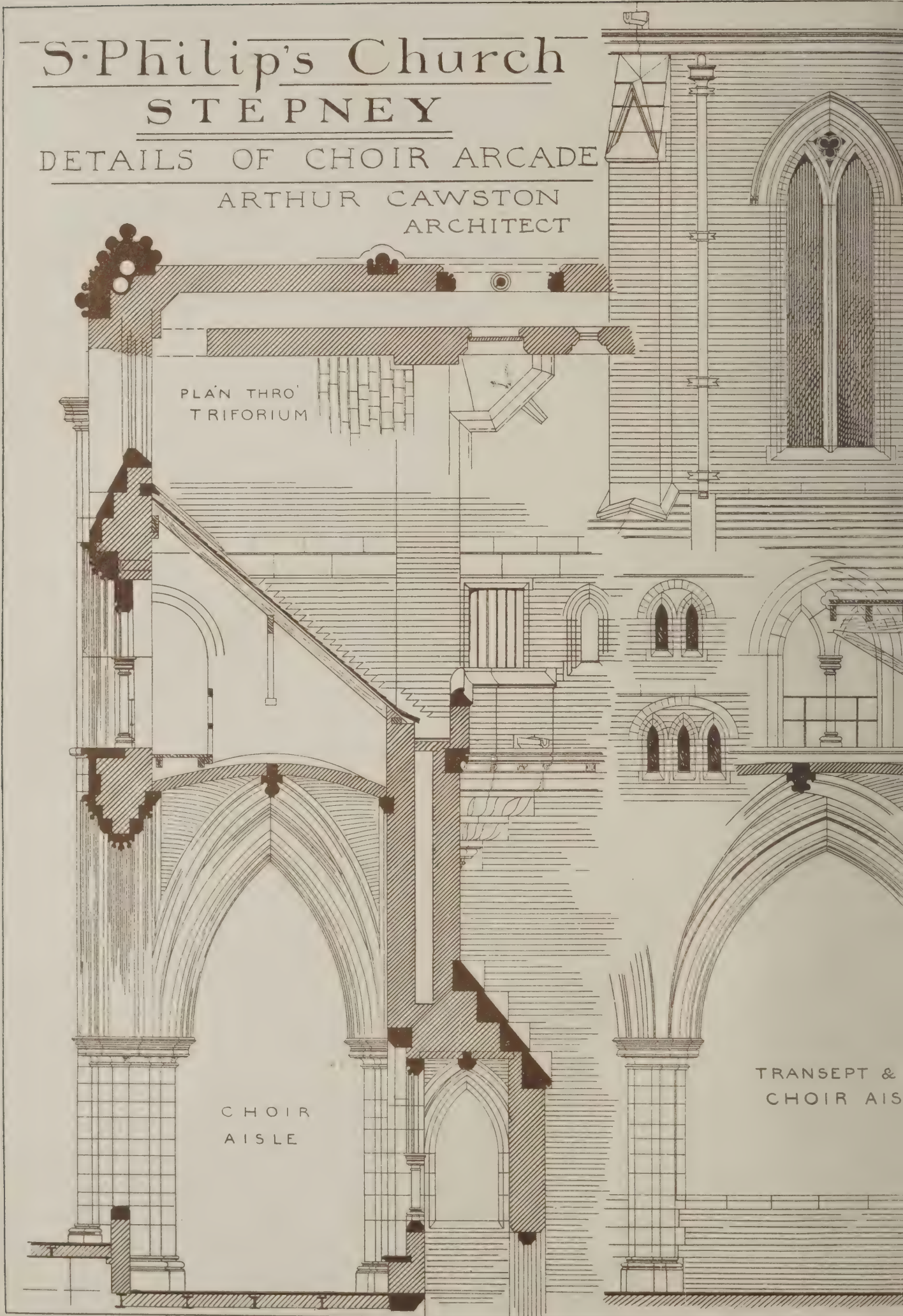




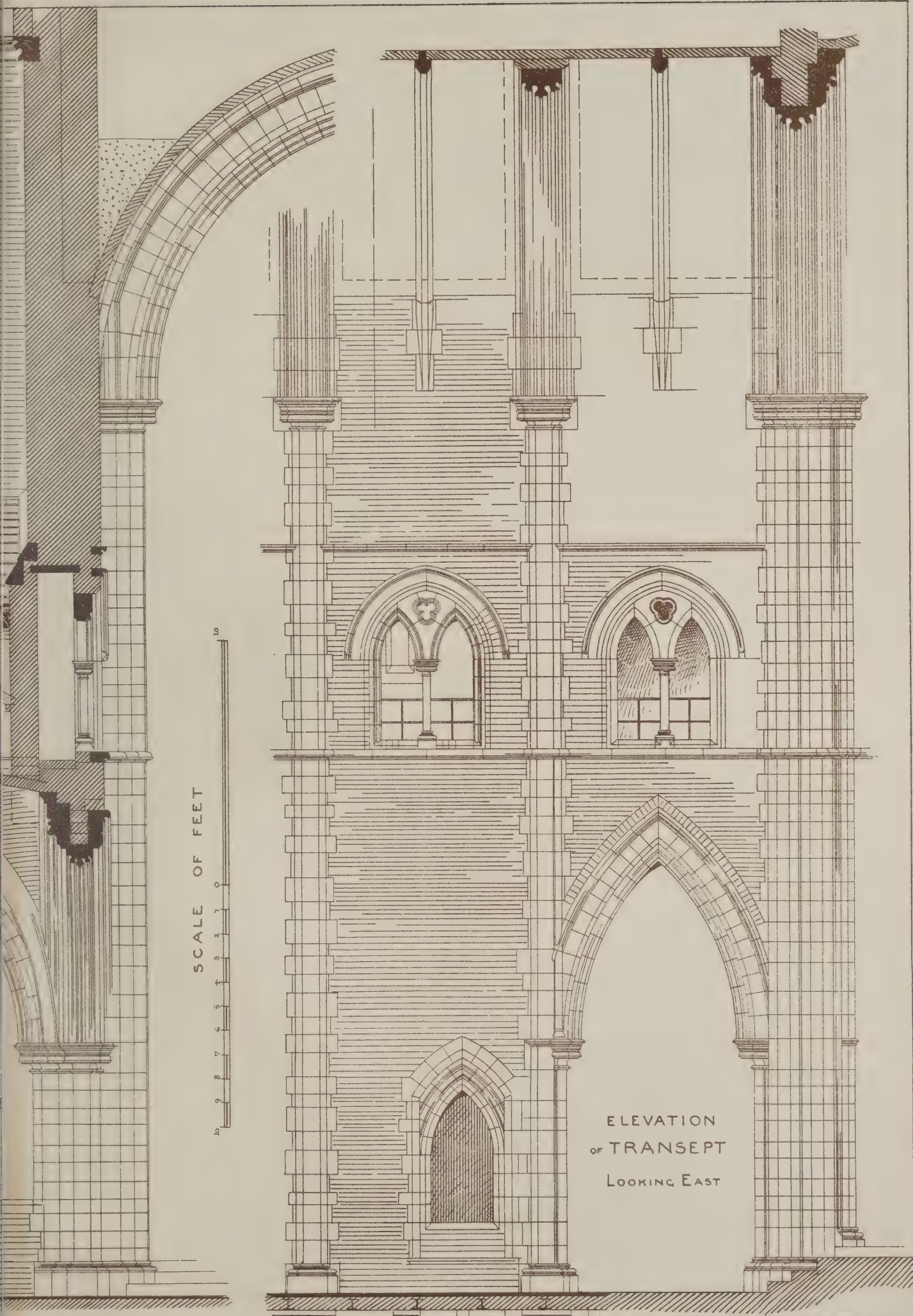
S. Philip's Church STEPNEY

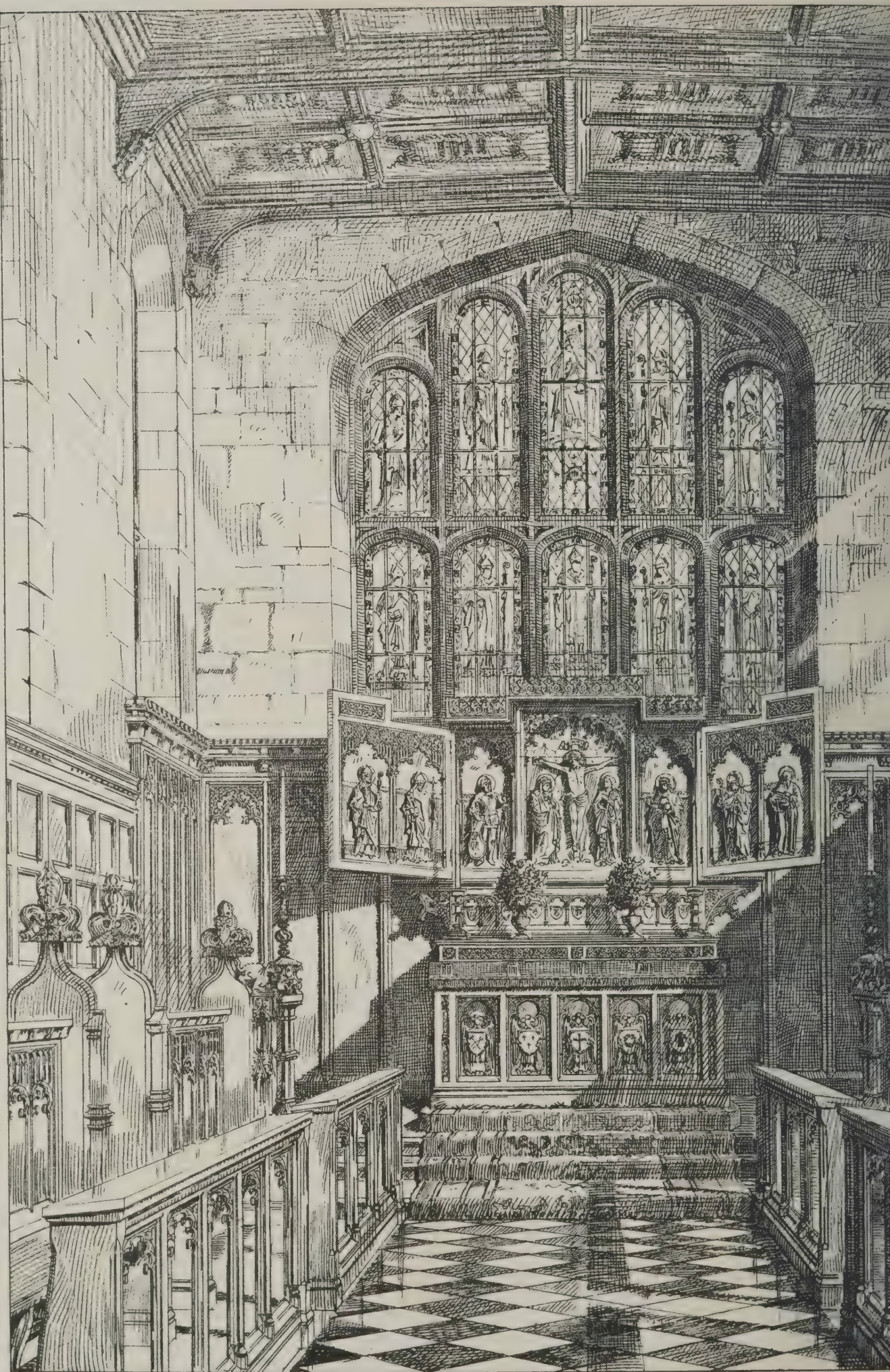
DETAILS OF CHOIR ARCADE

ARTHUR CAWSTON
ARCHITECT

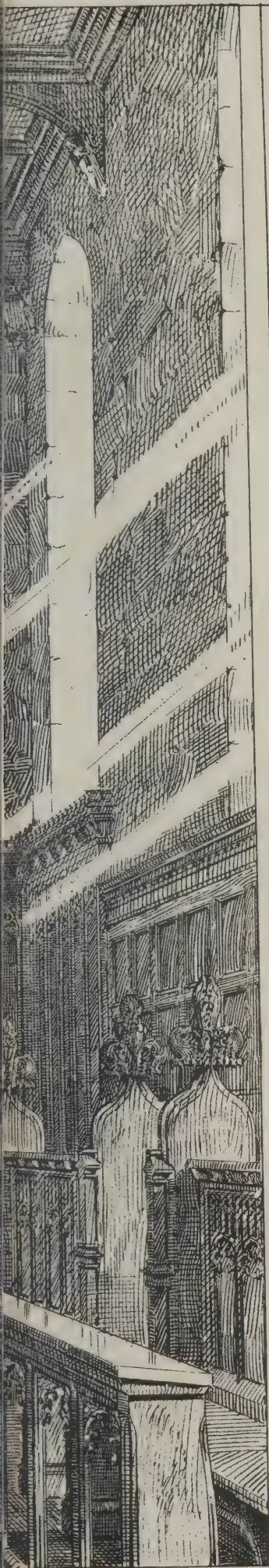


DEC. 23, 1892.





UNIVERSITY COLLEGE - DURHAM - CHAPEL AS REFITTED — C. HODGSON



OWLER F.S.A. ARCHT.

No 65 Cheapside E.C.
for Sir John Bennett Limt
A. Burnell Burnell & Co
FRISA



THE BUILDING NEWS, DEC. 23, 1892.



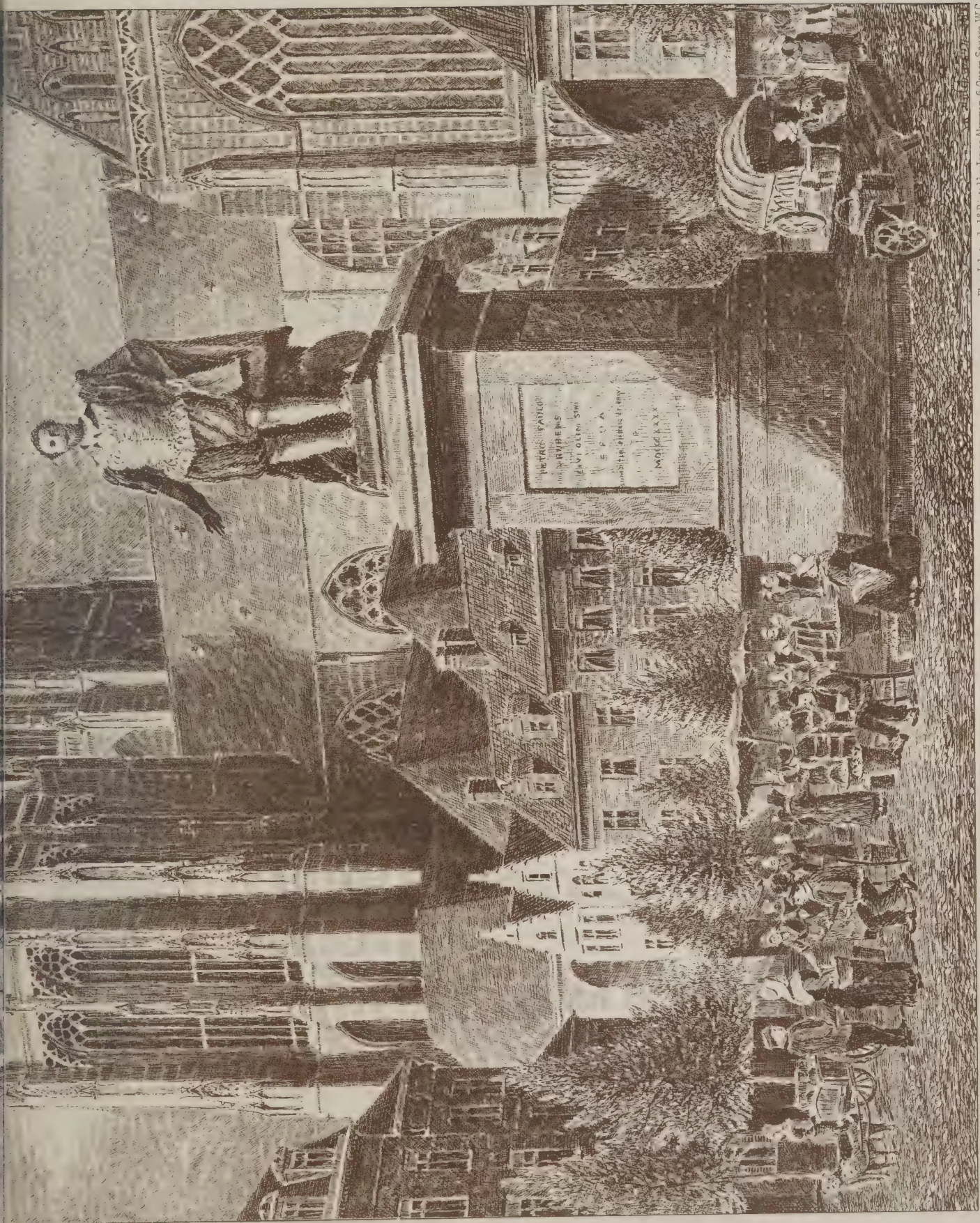


Photo-lithographed & Printed by James Altermann, 6 Queen Square, W.C.

The Antwerp Exhibition, June 27-1894, No. 6, P. 18, No. 18, No. 18

ANTWERP. CATHEDRAL. FROM THE "FACE VERTE." DRAWN BY J. R. HUTCHINSON.

THE BUILDING NEWS AND ENGINEERING JOURNAL.

VOL. LXIII.—No. 1982.

FRIDAY, DECEMBER 30, 1892.

DETAILS AND TENDERS.

GREAT artists have always paid attention to details. The sculptor is not fully satisfied with the general outlines and proportions of his figure group; his ambition is to perfect the design in those minor qualities of modelling the draperies, facial expression, and attitudes of his figures, which he sculpts in marble. The painter, after he has satisfied himself with a general sketch of his subject, and has decided upon the general composition and grouping, light, and shadow, devotes himself to various details, such as the study of anatomy, costume, drapery, or trees, waves, or other accessories which are to make up the particular subject he has selected, for it is attention to these details which prove the painter's knowledge and resources. In a greater degree the architect is called upon to make himself proficient in those various branches of construction and ornament which minister to the convenience and pleasure of his building. In a greater degree, we say, because an art whose sole aim is to give pleasure to our sense of vision, like painting, stands in a different position to one like architecture, in which the functions of art have to be associated with those of utility. A number of separate details go to make a building habitable, comfortable, and pleasant to the senses. Imagine for a moment what a room would be without a good floor, firm and comfortable to the tread, well-fitting doors, and windows that can be opened or closed without trouble, a fire-grate that will throw out the proper amount of heat, a well-designed chimney-piece, a mode of ventilation that will insure a proper supply of fresh air to a comfortable degree of warmth. We might even go further, and mention the value of secure and easily-adjusted fastenings and furniture to our doors and windows. All these details go to make a design complete and satisfactory to people of good taste; though it is remarkable to find some individuals—building owners and promoters—satisfied with badly-designed houses, and even churches, while they try to bestow every care upon the internal fittings and furniture. We often see a hideously-planned room, with bad mouldings and poorly-designed wood doors, furnished with the most correct "art" chairs, tables, and cabinets, as if such "high-class" furniture can look in keeping with, or harmonise well with, the wretched proportions and details of the room in which it is placed. The dictum to be enforced upon the ordinary British house-builder, or building committee of a public edifice of any kind, is that there must be *fitness* in our art, that buildings should be designed *fitted* for their receptive functions, and that their furniture and details must harmonise with the architect's work. A most obvious principle in our appreciation of art, whether it be music, the drama, painting, or sculpture, is that physical conditions or aptitudes for the enjoyment of them exist. Our appreciation of a stirring dramatic play or of a good concert is enhanced materially when we have comfortable seats, when cold draughts or oppressive heat are avoided, and when we can see and hear without straining our necks.

The same principle holds good in the contemplation of architecture and the subsidiary details which contribute towards it. We can enjoy a well-designed piece of furniture, a handsome vase, or a piece of sculpture or

painting all the more if it is surrounded by a congenial atmosphere or a background in harmony with it. It is lost or spoilt by being placed in an ugly recess, or against walls whose colour is out of key. The same principle of suitability or fitness ought to govern the architect in the design and selection of details, by which we mean not only architectural features, like gables and turrets, and towers and ornament, sculptural and otherwise, doors and windows, but the selection of materials and fittings. These are left to chance. Many of our finest buildings are spoiled by imperfect or inferior detail. Directly we go up to them, their charm of outline and good composition is gone. Doorways and windows are meanly carried out, the moulded work is meagre and commonplace, the woodwork is poor and thin, the fittings are inferior. A poverty-stricken look pervades the exterior in the columns, mullions, and projecting members, while the interior disappoints by the flimsy fittings, which are generally wanting in massiveness and character.

One characteristic that distinguishes the work of the real architect is the solidity of the stone and woodwork. We see the stone pilasters or mullions of substantial width and thickness, the reveals and jambs are deep, the wood frames of sashes or casements large and solid. Another characteristic is that ornament is reserved for points of interest. The doorway is not insignificant, but important, upon which the designer has bestowed extra pains. If there is little money for decorative treatment, this one feature at least receives its due share—all else is plain and solid; but upon the porch or the doorway is lavished the art of the mason, the modeller, or the stone-carver. If there is one important room, such as a public hall, it is also made a feature. The windows receive an extra share of attention, the piers have pilasters; gables and chimney-shafts are made features of interest.

The tower or turrets are other points upon which careful attention is bestowed in the shape of good profile and terminations, and in the details of windows and dressings. It is far better that, if the sum to be expended on ornament is small, it should be bestowed on these features, and the rest left quite plain, than that the whole exterior should be covered with poor ornament, weak and thin. The latter is, however, the course followed by many architects; they strain everything to make the principal façade ornamental, the interior is sacrificed to obtain a little flimsy tracery to the windows, or a little cheap carving or ornamental brickwork—in short, the idea of the designer of this class is to make a show of art at little cost. It is this sort of art-commercialism, if we may so call it, that is just now rampant. Everything must be smothered with so-called ornament. Where to put detail is one of those questions which seldom appear to be thought of. We find a great deal of it wasted, thrown away in positions that cannot be seen, or squandered on parts of the building which ought to be perfectly plain. Rules are sometimes misleading in these matters. No doubt it is a good general rule not to put too much detail near the ground, but to increase its quantity on the edifice as it ascends, and some of the best buildings conform to this principle. Their plinths and wall-spaces are severely plain for some height above the ground. Pugin knew how to apportion ornament for some of his finest buildings, like St. Augustine's, Ramsgate, and the Cathedral, Southwark, amongst others. The value of this rule—the severe plainness of the lower portions of the buildings or gradation—we find observed in the works of the late Mr. Street, and in those of Mr. Pearson and Mr. Sedding. But it is a principle commonly forgotten in works of less eminent masters. The rule we have noted of increasing the degree of detail and ornament as we ascend

is, however, not invariable; there are some places where the eye rests more than others, and where the detail ought to be more frequent, finer, and more delicate, as the tympana of doorways and gables, and other parts which are near the eye. In fact, we cannot observe any rigid rule in these matters. The artist's touch here and there gives life and interest to the canvas or the stone. But there is another thing yet besides gradation of detail; there is a scale of minuteness and finish. We often see elaboration thrown away about a very commonplace thing;—an over-enriched cornice forty or fifty feet high; while close to the eye we have a similar cornice, stringcourse, or panel, coarse, and large membered. These are matters of taste and feeling which no amount of knowledge and formulae will teach. We have been discussing external detail: the details of the interior are equally to be studied, and these include all those fittings and finishes which increase the convenience and comfort of a building. Our floors are often constructed without regard to their strength and impermeability. They transmit sound and gases. Though a number of patented systems are on the market for construction and flooring, architects are apt to overlook them because of their expense, and to use instead very inferior materials and labour. Then we use old methods of walls, partitions, and roofs equally faulty in their permitting sound, heat, and cold, to pass through them. Hollow-wall construction, fireproof lathing and plastering, slag-wool, are methods and materials which the architect has not turned to the best account. Even in the important means of the conservation of heat, by employing non-conducting materials for partitions and floors and roofs, we have made very little headway. Where to place our fires, heating chambers, and radiators so as to prevent loss of heat; how inlets for cold air and outlets for the vitiated atmosphere of our rooms and churches can be made to serve in this direction, and at the same time aid the propagation of sound in the latter, are points which have scarcely been thought out with any skillfulness. Empiricism is still the order of the day in these subjects, because architects have too long left them to engineering experts and have been in the habit of treating them as details unworthy of the artist's regard. This sentiment has been pernicious to architecture, for it has encouraged the spirit of separatism in art. In other things, like electric-light fittings, door furniture, fire-grates, the architect has little or nothing to do with them; they may be intensely ugly fittings, out of "key" with everything else, but they are selected under the contract. Our public buildings equally suffer in the details of fittings and decoration: a well designed set of rooms, hall, and staircase are atrociously decorated and fitted. The details have been handed over to wholesale decorators, gas-fitters, stained-glass makers, and others, and if the architect is not particular as to colour and design, the prospects are his whole work is sacrificed to a sort of cheap commercial art painful to contemplate.

The profession cannot expect to find an improved condition of things, till they take these details under their particular care, and endeavour to look upon them as an inseparable part of the design. For reasons not difficult to understand, especially when a low tender is indispensable, there is an aptness to look upon the building as architecturally complete, after the painters have left it, all the other trades being regarded as subsidiary or superfluous. These trades include the ironmongery, lock furniture, hot-water apparatus, electric bells and fittings, gas-fitting, decoration, stained glass, metal-work and furnishing—every one of which ought to be under the control of the architect in a special manner. They are, in fact, the finishing touches of the archi-

tectural design. Tradesmen of special goods, manufacturers, and artists have their directions too frequently from the contractor or the owner; the prices have been cut down to bring the total to the required amount. Their interests, as well as that of the architect, would be better served by a course which places all the trades under the immediate direction of the architect rather than that of "divided authority." Even "provisional sums" when introduced into specifications, do not guarantee that attention which they are intended to afford. Let each fitting and material receive the "hall mark" of the architect's approval if they are not really designed by him.

BUILDING BY-LAWS.

THE operation of the Local Government Board By-laws has been pretty general and uniform in large towns, as might have been anticipated. Yet we find here and there some difficulty in enforcing the model regulations upon builders who have been for many years their own masters, and who were allowed to do things of the most questionable kind in some towns. The inevitable friction of a newly introduced code has been considerable, so much so that local authorities have found it extremely hard to enforce their new by-laws. Penalties are constantly incurred by refractory builders and owners, as our Legal Intelligence weekly informs us, and in large towns the offices of surveyor and inspector are by no means light ones, especially when these officials have to cope with a number of "jerry" builders and house-owners who are also members of the corporation. Considerable variations and differences of opinion prevailed before the Local Government Board issued their model by-laws in 1877, prior to which, varying modes of construction were the result of leaving every urban authority the option of making by-laws of their own. These differences have left prejudices which still linger, and prevent any uniformity of practice;—e.g., to bring a building under the operation of the Act, it is necessary to prove it to be a "new" building. As our readers are aware, it is difficult to prove the newness of a building, as it may be an alteration or conversion of an old one, or a fire may have destroyed a considerable portion of the premises, rendering it not very easy to ascertain the extent of the damage or the reconstruction. The 159th section provides a limit by enacting that "the re-erecting of any building pulled down to or below the ground floor" shall be considered the erection of a new building, but the term "ground floor" may mean the floor level or the story, including the walls and ceiling of the ground floor. Builders are constantly found to interpret the clause in the latter manner. In another instance an old building is converted piecemeal, first by the alteration of internal walls and partitions, then by the removal of staircases and floors, the builder thus evading the law. We have frequently had to record cases of reconstruction in this gradual manner, by which a builder is practically enabled to erect a most objectionable and unsafe structure without any of the precautions required by the by-laws. It becomes necessary to check these insidious attempts to build by a continual observation being kept, or by periodical surveys being made. We can imagine a building under process of repair or conversion occupying a considerable time, in which case the builder might take advantage of the six months' notice, and contend that as the work was begun before any complaint was made, or before that period had commenced, no liability had been incurred. But the Act does not, we believe, give the surveyor the right to make inspections of premises at the commencement, so as to prevent the error or evasion.

Correspondents often desire information respecting the interpretation of certain by-laws. The term "topmost" story has given rise to much debate in reference to the question of the schedule of thickness of walls of dwelling-houses, and builders are very apt to take advantage of the rule in the case of two-story dwellings, one of which stories may be the space in the roof. The clause relating to concrete, a 6in. layer of which is provided over the site of every domestic building, is constantly a subject of question, and builders frequently evade the by-law altogether. Hollow walls and damp-courses are matters of constant misunderstanding, and it is for this reason requisite to print and distribute the sections of walls with cavities in those cases where the damp-courses have to be provided both above and below the ground level. To illustrate the schedules of wall thicknesses, many boroughs of importance publish sections, also the modes of dealing with recesses in walls, beams on party-walls, chimneys and hearth construction, as well as the modes of draining with sections of disconnecting siphon traps, mode of laying and ventilating drains, ventilating details to closets, and the modes of connecting sinks and baths. As an example we may refer to the excellent by-laws for new streets and buildings issued by the borough of Sheffield, those of the Bournemouth Corporation, and many others. These publications make it easier to understand the meaning of certain clauses, and have an instructional value besides. In this connection we hope before very long many of our leading urban authorities will follow the example of the Hornsey Local Board, who have fitted up a very complete sanitary museum at Highgate, in which almost every important sanitary appliance and material can be seen. A complete model to a full-size scale represents the approved system of drainage and ventilation for a dwelling-house, in which the pipes and drain through the house are shown in section, the latter embedded in concrete, with manhole and open channel pipes, the connection of the soil-pipes with closets and baths on each floor, and the ventilating pipes and anti-siphonage vents. Such a model would convey all the information found in the by-laws relating to the drainage of buildings and water-closets. The sectional model also shows the cavity structure of outer walls bonded by stoneware ties, the damp-courses and construction of floors, &c.

The museum may be made to represent every one of those points in the construction of buildings and drainage which are provided for in the by-laws, so that builders and owners may go and see what they are expected to provide under the Act. There are several by-laws which are not clearly understood by architects; one of these is in respect of half-timber work. The rule that framing is to be executed with a thickness of brickwork, 4½in. at least, behind every timber is certainly open to the objection that this class of timber framing encourages a very flimsy kind of construction, as the timber must be of small scantling, and only show on the face. Many other by-laws may be cited which are not very clear or give room for doubt, there are other local differences to consider, in all of which cases there ought to be some recognised authority to appeal to when disputes arise. We know that these differences of interpretation occur, the by-laws being variously interpreted.

IRON ARCHES OF LARGE SPAN.—V.

CAST IRON.

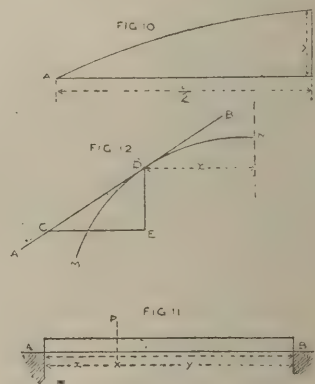
FROM the very great discrepancy that exists between the relative depths of an arched iron rib, when compared with that of a straight beam or girder, one might be at first led to expect that a very considerable saving of material would result from the employment of the former

type of construction. Theoretically, this is the case, but practically all the advantages prescribed by pure theory are very much reduced, in order to meet the conditions of actual loading and the exigencies of heavy and continual traffic. If D be the depth of an ordinary plate girder of wrought iron, and L its span, then the value of D would lie between $\frac{L}{14}$ and $\frac{L}{16}$. For a lat-

tice or open web girder the range would be from $\frac{D}{12}$ to $\frac{D}{8}$, although the latter proportion is not

usual in England. It is, however, a very common one in American truss bridges, and is, when properly designed, a decidedly economical ratio of depth to span, especially in girders of large dimensions. From the examples we have already adduced in our preceding articles, as well as from others to be subsequently alluded to, the proportion of the depth of the actual cast-iron ribs to their clear span will be found to be from one-fortieth to one-sixtieth.

The depth of the rib has nothing in common with the depth of a horizontal girder, for if it had, and if it entered into the calculation of the stresses, we should have, not a reduction, but a notable increase in the amount of material required. The economy of the rib form proceeds from another source, which will become apparent as we advance further with our subject. It will, at the same time, be understood, from what has been previously placed before our readers, that the depth of the rib itself will affect all calculations in which the "moment of inertia" is



involved, and, in treating of the deflection of ribs, the value of x in the equation given in our first article, $1 = \int b x^2 dx$, will be very different from that used in the case of a horizontal girder. In Fig. 10 let $A B$ represent the curve of pressure in an arched rib, make $BC = V$ and $AC = \frac{L}{2}$, and put $W =$ unit of loading per running foot of span or arch. Let $S =$ the stress at the centre of arch, and $HT =$ the horizontal thrust; then $S = HT = \frac{WL^2}{8V}$. If D be the depth of a horizontal girder under similar conditions of span and loading as the arched rib, then the stress at centre $= S = \frac{WL^2}{8D}$. But $V = D$, and, therefore, the two equations become identical, and the versed sine or rise of any arch is taken as equal to the depth of an analogous straight beam.

The actual depth given to an arched rib depends, to some extent, upon the length of the span, the rise of the arch, and the absolute available headway from the springing to road, or formation, level, as the circumstances may require. The depth of the rib in cast and also in wrought-iron arched bridges is often maintained constant, although the stresses vary in an increasing ratio, from the crown towards the springing. This increase again depends upon the nature of the curve adopted for the rib and the character of the loading. If the load be uniformly distributed, as it is usually assumed to be in structures of the class we are considering, the stresses will also be uniform throughout the rib, provided the curve of the arched rib be of the parabolic order. In ordinary cast and wrought-iron arches the circular curve is generally adopted; in the first place, for the sake of practical convenience, and, secondly, because in all instances in which the proportion between the span and rise do not exceed certain limits, the

curves differ very little from each other in actual contour, and the stresses, consequently, vary in similar small ratio. Westminster Bridge must be taken as an exception to this rule, as the real curve of the arch is one parallel to a parabola. Its construction is also somewhat peculiar. A cast-iron arched rib bridge, designed by the same engineer in York, is in the form of a Tudor arch, and presents a very striking and unusual appearance, although some aesthetic critics have taken exception to the pointed character imparted to the arch at the crown.

It may be readily shown that the common formula for the value of S in both girder and arch is, in each case, only a particular form of the more general formula for the stress at any point of each example. To take the straight girder first. Let the girder be supported on the abutments A and B , and let it be uniformly loaded with a total weight, W . The stress at the point P is required, the said point dividing the girder into two segments, x and y . Putting D for the depth of the girder, and S for the strain at P , we have $S = \frac{W \times x \times y}{2DL}$, in which L = the span of the girder. Making $x = (L - y)$, the equation becomes $S = \frac{W(L - y)y}{2DL}$. At the abutments $y = 0$ and S has the same value. At the centre of the girder $y = \frac{L}{2}$, and, substituting this value for y in the above equation, we obtain $S = \frac{W(2L - L)L}{8DL} = \frac{WL}{8D}$ = the stress at the centre already given.

In Fig. 12 let MM represent a portion of an arched rib, the vertex, or crown, being at N . Put w for the unit of load, and let the stress be required at the point D , situated at a distance, x , from the crown N . Through the point D draw a tangent to the curve MN . Make $DE = w \times x$ —that is, equal to the load between the point D and N . From E draw the horizontal line EC , meeting the tangent at C , and making with it the angle DOE , which put equal to θ . The horizontal line EC is equal to the stress at the centre, which put = H . The thrust on the arch at the point D is represented by the line CD , which make equal to T . Then $T^2 = H^2 + (w \times x)^2$. At the centre $x = 0$, which, it may be observed, is the same value which, in a straight girder, it has at the abutments, and the latter term of the equation vanishes, and $T = H = \frac{WL}{8D}$ as before.

There is another useful expression for T , which may be stated $T = H \times \secant \theta$. At the crown of the arch, the tangent CD becomes horizontal, and $\secant \theta = 1$; so we have, as before, $T = H$. If we square both sides of the equation, $T = H \times \secant \theta$, we obtain—

$$T^2 = H^2 \secant^2 \theta$$

and equating this expression with the other value of T^2 obtained above, we should have $H^2 \times \secant^2 \theta = H^2 + (w \times x)^2$. It is not difficult to prove this to be the case. Put $(w \times x) = W$. In Fig. 12 the line $DE = W$, and by the diagram we have—

$CD^2 = DE^2 + EC^2$, or $H^2 \times \secant^2 \theta = H^2 + W^2$. From the Fig. we obtain $W = H \times \text{tangent } \theta$, and, therefore—

$$H^2 \times \secant^2 \theta = H^2 + H^2 \times \text{tang.}^2 \theta.$$

But $\text{tang.}^2 \theta = (\secant^2 \theta - 1)$, and we thus obtain—

$$H^2 \times \secant^2 \theta = H^2 + H^2 (\secant^2 \theta - 1) = H^2 \times \secant^2 \theta,$$

thus establishing the identity of the two equations. It may be remarked here that, *mutatis mutandis*, the formulæ giving the stresses on an arch apply equally to the stresses on the chain of a suspension bridge: compression in the one case becomes tension in the other.

Before proceeding to give one or two examples of the method of designing and constructing cast-iron arched ribs of the most recent type, and deducing therefrom a practical comparison between them and other forms of girders, it will be advisable to inquire into the reason why the incontestable economy of the cast-iron rib is not fully realised in actual practice. It must be borne in mind, in dealing with the stresses upon iron bridges, roofs, or other engineering and architectural structures, that the actual stress upon any one particular section is not of so much importance as the uniformity of stress upon every

section taken in the aggregate. By the term uniformity of stress, is not meant that the stress is uniform throughout the whole girder or rib, but that each unit of area is subjected to the same unit of stress. The insurance of this condition was the great difficulty experienced in the early designs of iron structures. If not carried out in practice, the result is that when the beam or girder is subjected to the test of a breaking weight, it yields very frequently long before the ultimate compressive or tensile strength—which ever it may happen to be—of the material is reached. The quantity of material necessary at any part of an iron girder, rib, or other form, must be proportioned according to the nature of the stress, whether tensile or compressive, longitudinally, or of a vertical shearing character. In braced, trussed, lattice, trellis, and open web girders generally, the position of the part under strain has to be carefully considered, with reference to the particular unit strain to be adopted, especially in bridges of large dimensions, in which the ties and struts are of correspondingly similar proportions.

If S be the stress upon any part of an iron rib or beam, and C the unit adopted—that is, the stress per unit of area—then, if the area be represented by A , we have for the necessary amount of metal at that part, $A = \frac{S}{C}$. It is evident,

therefore, that if the value of C could be made a maximum for each particular description of stress throughout the whole structure, the economy of material would also be a maximum. This, however, can never arise in actual practice, as is apparent from what has been stated in our previous articles on this subject regarding the moment of resistance of the individual fibres of a rib or girder. The value of I for any particular fibre is proportional to the square of its distance from the neutral axis that is proportional to x^2 , and D being the depth of the rib, x has two limits, $x = 0$ and $x = \frac{D}{2}$. The horizontal

girder has the advantage that the lines of pressure, both compressive and tensile, are susceptible of comparatively small deviation. But in the rib, the line of centre of pressure may, under different conditions of loading, alter very considerably, and thus materially modify, if not almost destroy, the theoretical assumption of uniformity of pressure. It is no doubt partly due to this reason that all existing examples of cast iron arched ribs are subjected to, comparatively, a small unit strain, as will be pointed out more fully in a future article.

STABILITY OF WALLS ON SOILS.—X.

(Concluded.)

Graphic Representation of Equal and Unequal Pressures.

IN order that the stability of a tall structure, whose stability depends on gravitation, when acted on by force in a lateral direction, be not endangered, the position of the centre of the resultant of the lateral and vertical pressures intersecting the base should not deviate from the centre of resistance or centre of gravity of the horizontal section more than one-sixth of the effective diameter in the direction of deviation.

By the law of the variation of unequal pressures due to the tendency to overturn a plane, the decrease of pressure at one end corresponds with the increase at the other end.

When the centre of pressure is eccentric of the figure pressed, the pressures at the ends vary uniformly from end to end in the line of eccentricity, according to its degree. The graphic representation (Fig. 27) of the entire uniform perpendicular pressure applied at the centre of gravity of a surface is a rectangle, as $A B, a b$, and that of an unequal pressure applied eccentrically is a trapezoid so long as the resultant pressure is applied within the middle geometrical third of the pressed surface. But if it be applied at the limit of the middle-third—i.e., at one-sixth of the diameter of the base from its geometrical centre as at N , the figure representing the distribution of pressures becomes triangular as $A e B$, thereby indicating that the normal forces vary uniformly from zero at the end A to a maximum at B , the base of the triangle.

Moment of Overturning.—When the resultant force is applied within the extreme one third of the base, as at J , which is the one-third point of

the length of the semi-base, there is (1) a negative or upward pressure at the end A , causing tension or uplifting there of the upper surface of joint; (2) a zero or neutral point of pressures in the middle of the base C ; and (3) a maximum positive pressure downwards at the end B . These mechanical phenomena are indicated by the triangle $c d B$, the tension or uplifting being indicated by the extension of the side $c d$ of the triangle lying above the base $A B$. When there is no counter resistance at the end A , such as anchor or hold-down bolts, or the cohesion of cement mortar in the bed joints of masonry, then the practical bearing surface which supports the weight of the structure is thus reduced to one-half of the area of the base, whereby the former mean unit pressure on the supporting base is doubled, and the structure becomes unstable.

Moment of Overturning Implies Rigidity.—The treatment of the problem of safety thus as dependent merely against overturning on an edge as is sometimes done—i.e., a question of stability alone—involves the dangerous idea of regarding the structure as a perfectly rigid mass throughout, which the tiro must beware of.

Overturning Tendency of Wind Pressure.—The horizontal pressure of strong winds against the high walls and other exposed parts of buildings, towers, tall chimneys, especially in exposed positions, will tend to shift the points of concentration of weights of the superimposed structure more or less upon the leeward side of the static centre of the foundation base. The overturning force only causes a deviation of the point of concentration of weight towards the leeward side, but does not increase or diminish the total vertical weight.

Suppose in Fig. 28 the portion $c d' A B$ above the base $A B$ to represent a part of the vertical outline section of the extremes and centre portions of a tall mill chimney. Assume H to be the geometrical centre of the exposed windward side, and also to represent the point of its horizontal intersection with the vertical axis passing down through the centre of gravity of the mass, and therefore to be vertically above it.

Stability against Crushing.—In very tall structures acted on by wind force, such as a very lofty chimney, the moment of the wind-force leverage pressing the weight of the masonry, &c., of the entire mass with a reinforced intensity upon the footing courses or lower bed-joints of the masonry on the leeward side, and then be reacted on by a soil having, perhaps, a safe fourfold bearing power, would inevitably rupture and crush the projections of the footing courses before any overturning of the superstructure could more than begin.

Yielding of Overloaded Foundations.—A chimney such as is shown in portions in Fig. 30 could not be tilted by a lateral force so as to stand upon the toe of its footings below a , and thereby support all the weight of the entire superstructure, as if the footings remained perfectly rigid, as shown at A . The portion of the footings which acts as a cantilever must in such a case be ruptured or sheared off, and more or less deformed and crushed, as sketched at B , Fig. 30, before overturning to any extent could begin. The shank at the leeward side b , heretofore thus of its footing support, would more readily sink and crush into the soil. But, by the time the inclination in Fig. 30 is reached, there would be a tendency to sliding and splitting-off of the bottom masonry courses, whereby the superstructure would then collapse and be strewn upon the ground. A factory chimney at Ringsend, Dublin, 65ft. high, base 14ft. by 15ft., was demolished by a charge of 5lb. of gun-cotton (equivalent to $\frac{1}{3}$ rd of the requisite quantity of gunpowder) distributed in the same side of two corner piers. The chimney by the force of the explosion shook, and then leaned over about 30° , when it fell, the top striking the ground about 30ft. from the base. The debris was scattered about to the extent of 50ft. from the base. The brickwork bed-joints would thus slide upon the lower courses, pushing off before them more or less of the outside shell below on the leeward side, as indicated at $a b$. From the fact that the position of the top striking the ground was 30ft. from the base, the estimated angle of inclination before its collapse must in reality have been less than 30° , because $65\text{ft.} \times \cosine \text{ of } 30^\circ \text{ from vertical} = 55.5\text{ft.}$ [“Occasional Papers,” Royal Engineers’ Institute, Vol. II. (1873), p. 174.] When a soft soil is overloaded, the overturning of a structure submerged more or less in it in-

volves to some extent the properties of hydrostatic displacement.

Comparative Strength of Offsets and of Footings.—At pp. 419 and 518, *ante*, brief reference was made to the proper designing of footing offsets of any materials—i.e., of designing each offset separately, according to its individual cantilever action at the face of the wall-base; but inasmuch as many footings are erroneously arranged merely by rule of thumb according to the requirements of the Metropolitan Building By-laws, 1855, and the Model By-laws of the Local Government Board, in which their projection and height shall be at least half the thickness of the wall-base, which are insufficient both as regards the transverse strength of the brickwork footings, and also that of the underlying 9in. thick of concrete bed thereby required when the footings are not underlaid by a solid gravel bed. Such footings must necessarily yield before even less than 1 ton per square foot be loaded on them in a soft soil.

Stronger Footings in Soft Soils.—Their insufficiency is readily illustrated by the results of experiments at Akra, near Calcutta, with first-class Akra brick and Sylhet lime mortar, with two parts of soorkee (finely-crushed broken brick) laid in splayed footings, whose projection and height were each the whole width of the wall-base, the bottom course of bricks being laid double, adding $\frac{1}{4}$ th more to the height. The piers were three months and two days old, and the footings cracked right up to the base of the wall with a load of $1\frac{1}{2}$ ton per square foot of footing area. The relative strengths of the footings in the two cases would make the Metropolitan footings to crack in like manner with a load of $\frac{3}{4}$ ton per square foot of footing area, assuming the brickwork in the two cases to be of equal quality, and that the soils were of equal consistency. The undisturbed alluvial soil of Calcutta (which, it may be observed, corresponds to that of Lower Bengal) has the following bearing power:—When the trial pier was laid at 4ft. depth, it sank as under—with 1 ton 3-16in., 2 tons 1in., 3 tons 3 1-16in. per square foot; at 8ft. depth, with 1 ton 3-16in., 2 tons 11-16in., 3 tons 1 13-16in. per square foot; at 11ft. depth, the sinking was much greater than the above. But inasmuch as “splayed footings” are usually built with $\frac{1}{4}$ -brick offsets, the angle of the splay would be about 53° instead of 45° , and consequently the $\frac{3}{4}$ ton would be increased to 0.96 ton with a double bottom course of brick. The relation of the strengths of the two models of footings, the “Akra” having double the depth and projection, in terms of the wall-base, that the “Metropolitan” model has, may be thus formulated:—If $\frac{d^2}{l} \times 1.5$ ton represent

the strength of the “Akra” model, then $\frac{1}{2} \frac{d^2}{l} \times 1.5 = .75$ ton = relative strength of the “Metropolitan” model.

The above experiments were made by H. Leonard, M.I.C.E., late chief engineer P.W.D., Bengal. *Indian Engineering*, Dec. 1st, 1888.

Brickwork Footings.—At p. 419, *ante*, it was pointed out that the reactions at the centre of the sum of the offsets of the footings outside of the face of the wall-base should be estimated. The data (R and offsets) for “best hard” and “hard” brick footings given in the table at p. 420, *ante*, were estimated on the basis of the transverse strength of single bricks, which would be suitable for footings on a very hard and sensibly incompressible soil; but when soft, alluvial soils are to be dealt with, such as that of Calcutta, the ratio of the projection l of footings beyond their wall-base to depth d , should be, for the “Metropolitan” model footings, at most only one-half, because the 1.5 ton and .75 ton loads represented respectively the “breaking” strengths of the two models.

Referring to p. 420, *ante*, a formula was given for readily computing the projection p of footing offsets in terms of thickness of the course t , both in inches, i.e.:—

$$p = \frac{1}{2} t \sqrt{\frac{\text{Modulus of Rupture R}}{\text{Pressure, tons per sq. ft. P}}}$$

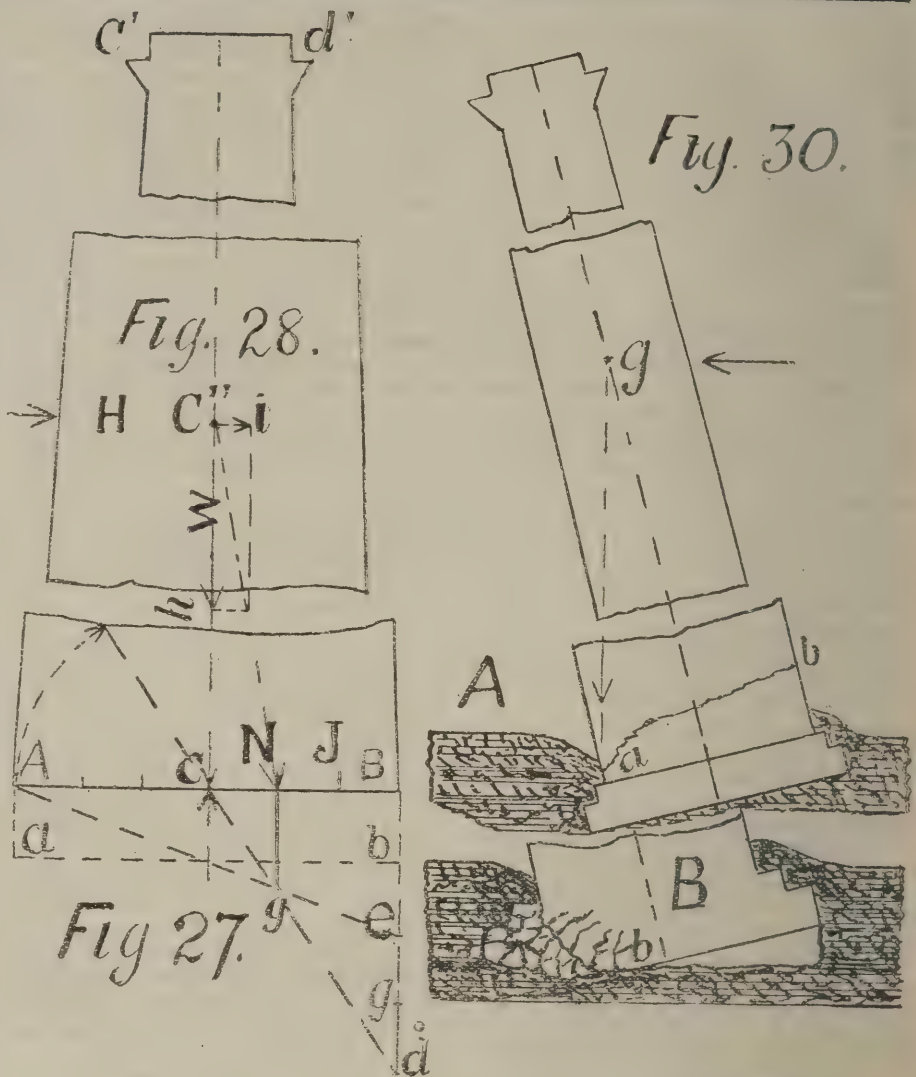
R being in pounds per square inch. The table in same page gave the projection for one ton pressure on footings per square foot, and for simplicity a note was appended that for other pressures it was suggested to use a multiplier or fraction. It would, however, be a nearer approximation to use the following fractional parts of it—viz., for $\frac{1}{2}$ ton, $\frac{2}{3}$ rd; for 2 tons, $\frac{3}{4}$ rd;

for 3 tons, $\frac{1}{2}$ to $\frac{3}{4}$ ths. Thus the projections for the following materials in table, computed by the formula, in terms of thickness, are—

	$\frac{1}{2}$ ton.	1 ton.	2 tons.	3 tons.
“Best hard brick”	2.7	1.9	1.36	1.1 times t .
“Hard brick”	2.0	1.4	1.0	0.8
Portland cement concrete	0.8	0.6	0.43	0.35

Concrete Footings.—There are often cases in which useful local materials, suitable for “aggregates” of concrete, are readily available for footings, and consequently when concrete would be more economical than brickwork. Brickwork should always be of hard burned or “blue” brick, laid in hydraulic lime or Portland cement mortar. True economy in deciding whether brick or concrete is desirable in footings in particular cases can only depend upon the relation of their expense to the transverse strength obtainable in either case, for both are alike weak and uncertain, or otherwise, according to the character of the materials and workmanship put in them. The concrete “splay” is a continuous bevel or slope down from the base of the wall to the top of the square toe of the concrete bed proper, like an inverted bracket or corbel on each side of the wall-base. There is, however, one important principle involved in reaching the decision, which must not be lost sight of—namely, the concrete in the footings and underlying bed when in a homogeneous monolithic mass can be estimated as of one solid depth with the “splays,” whereas the brickwork footings with the underlying concrete bed must be estimated separately. As the transverse strength is as the square of the continuous depth, it is evident that the square of a number is always greater than the sum of the squares of its parts. Allowance must be made for the shrinkage of concrete of $\frac{1}{10}$ th to $\frac{1}{12}$ th of its height, according to the “closeness” or “openness” of the aggregate employed.

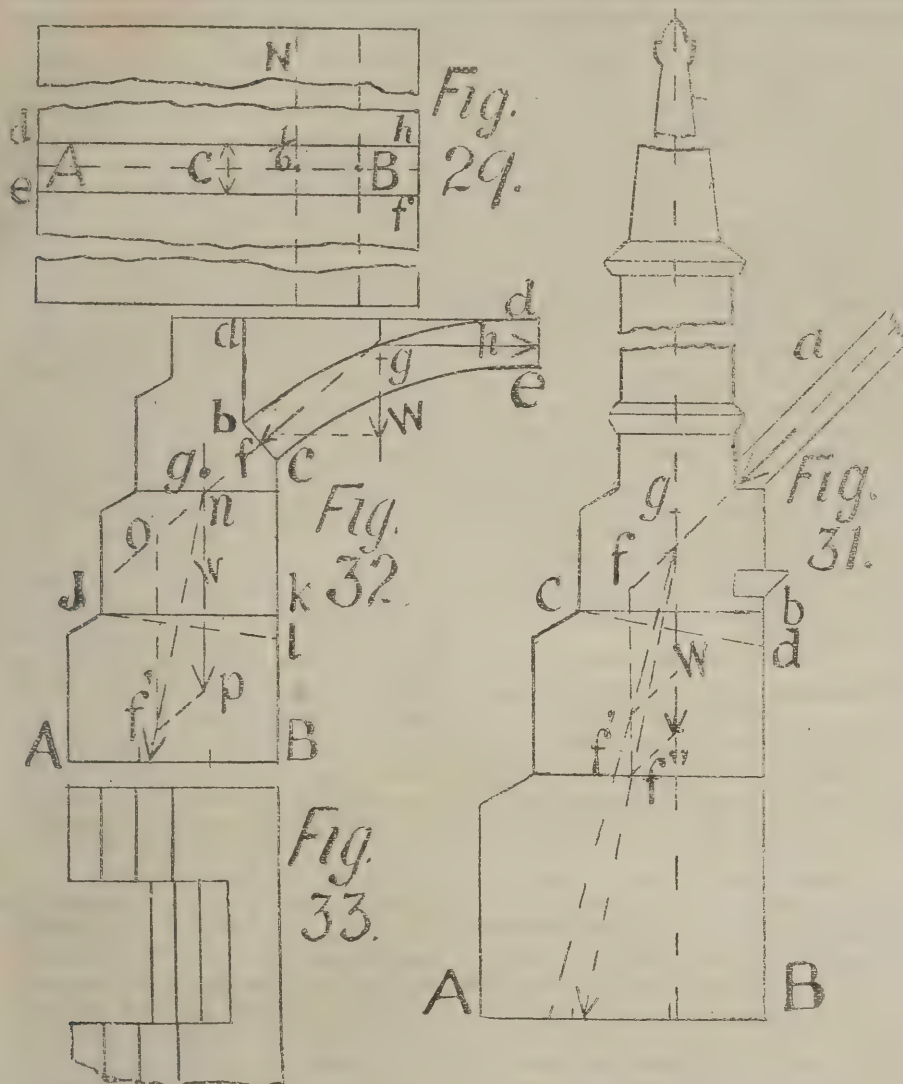
Unequal Distribution of Vertical Pressure.—When the wind-force is acting in the direction



of the horizontal arrow at H, Fig. 28, it has the tendency to depress the end B, and to raise the end A of the base of the chimney, the degree of displacement depending upon the precise point on one side of the geometrical centre of the base in which the resultant force of the wind and the load intersect the base. Thus, if it be distant from the centre C of the base $1/6$ th of its length, the maximum pressure at B is twice the ordinate Aa, Fig. 27, and the pressure at A is zero, A representing the length de , Fig. 29, of a rectangular unit, $defh$, on plan of the horizontal base of the chimney whose central transverse axis is A B, Fig. 29. The adhesive and cohesive strength of the mortar of the bed-joint of the wall-base of the chimney, represented in vertical section by A B, Fig. 28, may increase the stability; but in practice this strength is disregarded in the data of the estimate of the stability of the structure, as it may be impaired by inferior quality, or be dislocated by unequal subsidence. The ordinate N g, Fig. 27, passing through the centre of gravity of the triangle A e B, equals the mean unit value of the resultant pressure along the line N, 1-6 on plan, Fig. 29.

If H, Fig. 28, equals the total pressure of the wind-force concentrated at the centre of pressure e' , and its length be laid off by scale from the vertical axis e' along to i , then if W equals the total weight of the chimney above A B, and be laid off by the same scale downwards from e' to h , and the parallelogram be completed, the diagonal from e' will intersect the base in the point of application N of the resultant pressure derived from these horizontal and vertical forces.

If the resultant pressure should pass outside the middle third of the base, as at J, at one-third the length of the base from its centre C, then the total vertical pressure is crowded upon the leeward half only of the base C B, and consequently the mean unit pressure over the half base becomes double of the same total pressure when spread over the whole base. The maximum pressure B d (Fig. 27) equals twice the augmented pressure B e. The zero pressure is thus changed



from A to C, and there would be tension or up-lifting force at A equal to the downward force at B, making the structure unstable.

Uniform Distribution of Vertical Pressure.—When there is no wind-force acting upon the chimney, the pressure upon the foundation is uniform. The parallelogram A a, B b, represents the amount of that pressure, in which its intensity per unit area of foundation surface = the ordinate A a, which = the ordinates at all points along A B, and therefore the downward system of parallel forces or loads, and the upward parallel system of reactions balance each other. This may be indicated by the upward and downward arrows at C, being the resultants of the parallel forces which are placed opposite each other in the vertical line d'c of the centre of gravity of the rectangle A a, B b, and of the chimney. C is the position of the centre of the load pressure upon the soil. N is the centre of resultant of load pressure and the wind-force. When the central load pressure is in the geometrical centre of the base A B, there is no influencing wind-force, and the pressure is uniform along A B.

Eccentric Loads Act as a Static Couple.—If the resisting pressure of the soil (i.e., the reaction) is conceived to remain uniform and to act through its centre of pressure, C, in the direction of the upward arrow, and that the resultant of the loads and of the wind pressure act downward at the point N, they, being equal, parallel, and acting in opposite directions, form a static couple tending to rotate the arm of the couple round its centre. The moment of this couple is measured by the perpendicular leverage between the parallel lines of their direction \times one of the forces. The tendency of this couple in one direction is resisted by the opposing couple, made up of an increased resistance of the soil-base on the leeward moiety, and the decrease of the load pressure upon the windward half or moiety of the base.

Limiting the Pressure on Soils—Stability Against Unequal Settlements.—The maximum resultant

pressure exerted by the total loads upon the foundation soil at all points should be carefully proportioned by having a sufficient extension of the foundation base, so as not to exceed its safe unit-bearing power. The unit pressure should be uniform throughout the foundations of the same building. (See table of the usual loads in practice upon particular soils, p. 243, ante.)

It is evident from a consideration of the above demonstrated practical principle what a little deviation of the point of application of the resultant pressure from the centre of the breadth of the foundation base is sufficient to induce a disturbance more or less serious in its consequences when supported upon compressible soils. Thus a deviation of one-sixth of the breadth of the base from its geometrical centre is sufficient to bring a zero or vanishing pressure at the windward edge—i.e., on the longer arm of the base leverage, and double the unit pressure at the leeward side, assuming the base to be rigid. But if not, and that the transverse strength of the offsets of the footings be insufficient so that they break away, or are turned up on the edge, then even a less deviation may produce a dangerous disturbance, and thereby induce an extra increased unit pressure upon the soil underlying the leeward side of the base area thus reduced, so that the augmented pressure dangerously exceeds the safe unit-bearing power of the soil. It will thus be seen that a factor of safety of four at least in the bearing power of the soil should always be provided in exposed tall structures, and should be increased for structures of a permanent character.

Abutments of Bridge Arches, Counterforts, Buttresses, Retaining-Walls, &c.—In the above and such-like structures which are intended to resist oblique thrust, with more or less of a horizontal component that tends directly to overturn them, it is usual to have the resultant oblique thrust to intersect the footing base or any given bed-joint within the middle-third of their breadth in the line of the thrust. The

middle-third principle has been explained in the last article with reference to the position of the centre of vertical pressure. In the present instance it has reference to the centre of pressure in an oblique direction.

Blockwork.—Conditions of Stability.—In treating of the stability of such structures, they are considered under the conditions which determine the stability of "blockwork"—i.e., composed of a series of superimposed blocks or courses of bonded masonry. These conditions are deduced, from the action of (1) friction (2) position, and of (3) crushing resistance, as follows: 1. The obliquity of pressure should not exceed the angle of repose. 2. The ratio of deviation of centre of pressure from geometrical centre of joint to the length of its diameter in the line of deviation must not exceed $\frac{1}{3}$ to $\frac{2}{3}$, according to circumstances. 3. The stability against crushing of the blocks, or the crushing resistance, is included under "strength of materials." For crushing resistance of stones see p. 628, Vol. LXII. Both of these conditions of stability should be fulfilled at each plane or bed-joint of the structure. The known pressure in position, direction, and amount, acting upon the top joint of a block in a superimposed series of blocks, when combined with the weight of the block and any external force acting upon it, will give the entire resultant pressure at its bottom bed-joint, in intensity, direction, and position. This resultant will intersect the latter joint in the centre of pressure.

Buttress.—A buttress may be distinguished as masonry projecting from the front of a wall to increase its moment of stability. It is principally used to counteract the oblique thrust of roof trusses in Mediaeval edifices, as A, Fig. 31, a being the principal rafter whose axis will represent the line of action of the resultant of all forces abutting upon it above the joint with its template.

In Mediaeval buildings buttresses were introduced to resist the oblique thrust of vaulting and groining, in which cases the centre of oblique pressures will be discharged upon the abutment through the ribs of the groins or the voussoirs of the vault, and likewise those of the arch of a bridge.

If Fig. 32 be conceived to represent a part of a surbated vault, and b, c be a voussoir joint in the vaulting; then g, f represents the direction of its oblique thrust discharged upon the buttress C, B, A, J. If, however, Fig. 32 were the abutment of a bridge arch, then A, J would represent one of a series of counterforts between the wing walls, which retain the embankment and its slope.

Retaining Walls are intended to resist the thrust of abutting banks of earth, or rather the wedge-shape section of the earth lying above the slope of repose of the earth, which has a tendency to slide the wedge section, and thereby produce a horizontal displacement of the wall, either along the base or a bed-joint, or it may cause the top to overhang the base more or less according to the relation of the resultant of the thrusting and resisting forces involved. Owing to the prevalence of the tendency of earth thrust to slide a retaining wall in a horizontal direction either along its base or on a bed-joint, while retaining its vertical position, it is usual to incline the base, and when founded on clay, shale, or slippery soil to step and toe the base in the soil. The bed-joints of the courses of masonry are also inclined in a dip towards the bank, and likewise to give the face a better of a similar inclination from the vertical. [The present article does not contemplate the discussion of the theory of retaining walls.]

Pilaster is a shallower projection of masonry than a buttress, and is intended to serve a different purpose to the foregoing—i.e., to increase the compressive wall area at the distributive points of heavy loading, and likewise to stiffen the wall against buckling in its height. The strength of pilasters is governed by the same principles as determine that of slender pillars, which the limits of the present article do not admit of discussing.

Buttressed Retaining Walls for Cellars.—Retaining-walls are sometimes composed of buttresses, with a system of bay archings between them in a vertical plane. For deep cellar or basement and area walls they are economical of materials, when the buttresses also act as the supporting pillars of the superstructure, whose weight becomes the counterloading to the horizontal thrust of the earth. The arched bay has

no footing, so as to avoid unequal settlement; but is supported by an arch ring, springing from the pier footings.

Oblique Abutting Force.—In order to compute the stability of a structure against an oblique force, it is necessary to know the amount, position, and direction of that force. As a simple illustration, suppose that in order to compute the sufficiency of an abutment against the oblique thrust of an arch and spandrel, its amount, position, and direction are required.

Thrust of Arches, Vaults, and Groins.—Assuming the half-arch and spandrel (*a c d e*, Fig. 32) to act as one rigid mass upon the skewback *b e*, the amount of thrust can be obtained by the principle of moments of its centre of gravity about the centre of the skew joint. [The centre of gravity can be found by suspending its shape *a b c d e* drawn to scale, and cut out of cardboard, from the ends of two diameters normal to each other, the intersection of these diameters will be the centre of gravity of the shape]. Assume that the centre of gravity is at *g*, through it draw a vertical line *g w*, then from the centre of the key-stone joint *h* draw a horizontal line intersecting the vertical in the point *g*. This line *h g* represents the direction of the horizontal pressure exerted by the opposite half-arch and spandrel, which holds the halves of the arch in equilibrium against each other. From the point of intersection *g* draw a line to the centre of the skewback joint *f*, and produce it indefinitely down the abutment. From the point *g* measure down the vertical *g w* equal weight of the half-arch and spandrel. From *w* draw a horizontal line intersecting *f g* in the point *f*. Then *w f* by the same scale is the measure of the horizontal thrust, and *g f* of the oblique thrust—i.e., the resultant of the vertical and horizontal forces, and also its direction at the joint of the skewback, tending to overturn the abutment or to slide it along some of its bed-joints.

Stability against Overturning.—As the weight of the abutment reinforces its stability, the value of this above the base or any joint whose stability is to be checked, is to be ascertained as well as its centre of gravity. Draw a vertical through this centre of gravity of the portion *a J K c*, above the bed-joints *J K*, intersecting the line of oblique thrust in the point *n*. From *n* measure off *n o = g f* the amount of the thrust by scale, and from *n* measure *n p =* the weight of the portion of the abutment above the joint *J K*, and complete the parallelogram *n o f' p* and draw the diagonal *n f'*, which gives the direction of the resultant of the arch-thrust and the weight of abutment above *J K*, and which intersects it at a point within the middle third.

Similarly we might find the direction of the resultant of the weight of the whole abutment above the base *A B* and the point of its intersecting the base. The extension of the diagonal *n f'* however intersects the base within the middle third.

Stability against Sliding.—Having now obtained satisfactory proof that the abutment is stable against overturning, it must next be ascertained if the bed-joints are safe against sliding. For this purpose measure the angle which the normal to the joint makes with the resultant at the joint. The natural tangent of this angle is the coefficient of friction. If, now, the coefficient of friction of the masonry employed be obtained from the table at p. 801 ante, and we find that it is not exceeded by the natural tangent of the measured angle, the bed-joint is safe against sliding by the effort of the oblique thrust.

If the measured angle with the normal were greater than the angle of repose of the masonry, the abutment above the joint would slide and be unsafe.

Friction a Factor of Weight.—Since the coefficient of friction is a factor of the weight pressing on the joint, the remedy must either be (1) an addition to the weight, or (2) by inclining the bed-joint so that its normal would make a less angle with the resultant thrust—i.e., would be more nearly perpendicular to the bed-joint.

Inclined Bed-joints.—Thus the joint *J K* might be inclined to *J l*, so that its normal would make a less angle with line of thrust. The most notable examples of the application of the (1) expedient are the pinnacles surmounting the buttresses in Mediæval edifices. (See Fig. 31.) Examples are also found in engineering structures, such as frequently may be introduced on retaining walls. Thus the terminal pillar of the

wing wall of an embanked road bridge at Edinburgh, westward of the castle, is surmounted by a high pyramid, because of confined space, which did not admit of a lateral extension equivalent to the moment of stability required.

Thrust of Roof Trusses, Struts, or Framework.—By a similar procedure to that already described with regard to the resolution of the forces, illustrated by Fig. 32, the thrusting forces acting along the axis *a* of the principal rafter of a roof truss, or of a strut, or a converging point of framework (Fig. 31), and the resisting forces of the pinnacled buttress *c A B b* can be resolved. Then from the intersection of a vertical passing the centre of gravity of the buttress and pinnacle above the bed-joint *c b*, with the oblique force *a g f* lay off *g f' =* to that force by a convenient scale, and from the same intersection point *g* lay off *g w =* weight of buttress and pinnacle above the joint *c b*. Then complete the parallelogram *f f' w*, and draw its diagonal *g f'* to intersect the joint *c b*. If this intersection be not within the middle third of the joint, then increase the weight of the pinnacle by extending its height. Suppose the increased weight to be represented by the arrow extension, then complete the parallelogram *g f' w*, and draw its diagonal *g f''* intersecting the lower joint in *f''*, which is within the middle third. The joint has also been proved safe by friction against horizontal sliding, as already explained.

CYLINDERS AND TANKS FOR HOT-WATER WORKS.

THERE is inquiry very commonly made as to the particular uses of these two kinds of hot-water reservoirs, and as to why one shape is used instead of the other. In other words, it is asked—Is there actual need for these two distinct shapes, and why one or the other will not do in all cases?

This question does not emanate from a skilled hot-water engineer, of course; but it does not follow that it comes from one totally ignorant of the work. There are many very capable of erecting an apparatus upon the older "tank system" who are not conversant or had experience with the more modern cylinder arrangement, and the question from such is not an unreasonable one. It is not only the builder, who having a limited number of hot-water jobs cannot keep pace with the times, but the architectural profession has frequently to fall behind if their works do not often touch upon undertakings of this kind.

The two articles in question are here shown—Fig. 1, the tank; and Fig. 2, the cylinder. With the older form of hot-water apparatus the former was invariably used, and generally situated up in the roof of the residence, or, at any rate, it was placed above the highest draw-off tap. This high position made it eminently adapted for its purpose, as, being so near to the supply of cold water, it had but little pressure to withstand internally. With the "cylinder system" of apparatus, which is of a more modern plan, the hot-water reservoir or tank is placed close down beside the boiler or kitchen range, and therefore a considerable distance below the cold-water cistern, which is at the house-top. This distance necessitates a high pressure or strain being exerted inside the tank, and if of square shape there is every possibility of its bursting, or some joints giving way at least, when it is charged with water. With this latter system a cylindrical-shaped tank or reservoir (usually called a cylinder) is almost invariably needed, and it has given the distinctive name to the system. It is quite possible to carry out the "cylinder system" of hot-water works with a square tank as the reservoir, provided this latter article is capable of withstanding the pressure. Figs. 3 and 4 show the tank and cylinder systems respectively in a simple form.

This pressure of water from the cold-water cistern to the hot-water reservoir is not as much understood as it might be, yet the knowledge is very essential in carrying out hot-water works of any kind. When an apparatus is erected upon the cylinder system, with the cylinder, say, 30ft. below the cold-water cistern, there is a pressure of 13lb. upon every square inch of surface within this cylinder, which upon a rough computation represents a total aggregate pressure upon the interior surface of about 10 tons. If we put a square tank in such a position it would bulge out and endeavour to assume a spherical shape, and this means injury and leakage. The pressure of

water in pipes is 1lb. for every 2ft. 4in. in height. In other words, a pipe 2ft. 4in. in height and lin. square (inside measurement) holds a pound weight of water. It will be seen, therefore, that if there is 30ft. vertical distance between the cold-water cistern and the cylinder or tank, the pressure exerted in the latter is 13lb. per square inch as just stated. There is a notion that the fact of its being a hot-water apparatus lends to this strain or pressure, but this idea is fallacious, as the exertion is due to mere weight of water, and, whether hot or cold, is the same. In the illustrations, 3 and 4, it will be seen upon a little reflection that as regards the phenomena of pressure, &c., it is simplicity itself. Water flows down a pipe from the cold-water cistern, and after filling all the pipes and vessels below, it finds its own level in the pipe that extends up to above the level of the cistern in question. The strain upon the reservoir, boilers, &c., below is, therefore, the mere weight of water pressing down these pipes, 1lb. for every 2ft. 4in. vertical measurement. It is only vertical measurement that counts; horizontal pipes are inert, and sloping pipes are active only as regards the difference in height of their opposite ends.

The utility of cylinder and tank then amounts to their ability to withstand the pressure, the former better than the latter. This might lead to its being asked why cylinders, the superior pressure-resisting reservoirs, are not used always. The reasons are two: first, that the cylindrical shape occupies more room than a square or rectangular tank of equal capacity; secondly, cylinders are the more expensive. The difference in expense is considerable when we take a cylinder and tank of equal thickness of metal; but if we ignore the thickness of plate, and compare the pressure-resisting powers, the expense is reversed. It must be borne in mind that although consideration for pressure is requisite, and of primary importance, it does not follow that a reservoir of just exact strength be used always, and if good work is required, a better quality than the mere pressure calls for should be used. For instance, a cylinder of very light metal would be equal to 25ft. pressure; in fact, one of stout sheet tin would bear it; but how long would such a flimsy thing last? All tanks and cylinders should be used at least one quality greater than the bare pressure necessitates, as such articles should be capable of continuing their work efficiently for several years. A well-known tank-maker's list gives tested pressures as follows:—

Galvanised Rectangular H.W. Tanks.

Tested to, per square inch:—

16 gauge.	14 gauge.	12 gauge.	$\frac{1}{2}$ plate.	$\frac{3}{4}$ plate.
11lb.	31b.	41b.	51b.	101b.

Galvanised Cylindrical H.W. Tanks.

Tested to, per square inch:—

16 gauge.	14 gauge.	12 gauge.	$\frac{1}{2}$ plate.	$\frac{3}{4}$ plate.
51b.	151b.	201b.	251b.	401b.

Now tested pressures do not mean the utmost limit of pressure when leakage commences. It would be possible to put them to work greater than the tested pressures, and to do it effectually; but the practice is not commendable, as just stated, and really should not be thought of.

The square or rectangular tanks are almost invariably made with manholes and lids; but cylinders are not always so provided. With these latter the list says: "With manhole and cover, or loose bolted top, £4 5s." (the price of a certain size); "without manhole or loose top, £3 18s." By this we see that putting a manhole and cover, or a loose bolted top, costs on an average 7s.—that is to say, if the cylinder is ordered without these conveniences, and is supplied with a fast riveted top, and without any means of access to the interior, the price is 7s. less than otherwise. Now, a lid is not an absolute necessity with either, if flanges are provided at the points where the pipes have to be connected. If we connect a tank, as Fig. 5, and a cylinder, as Fig. 6, it will be seen that no part of the work takes place inside, as the flanges (which are attached outside) permit of the pipes being securely jointed into their substances. Tanks and cylinders never really require to be opened for cleaning or any other purpose after they are once fixed. No hurtful accumulation of hard deposit occurs within them, and any dirt matter can be flushed out.

It is not particularly recommended to use either of these articles without lids or means of access to the interiors; but it will be seen that such a

thing is quite possible and practical. One very common way of connecting the pipes is as Figs. 7 and 8. When done in this manner, access to the interior is absolutely necessary, otherwise the interior connections, the stand-pipes shown, could not be attached.

Reverting to the pressure of water again, there is one question, which is occasionally looked upon somewhat as a problem, that might be explained. This is the fact that the pressure in cylinder or tank is precisely the same whatever sized pipe be used, and independently of the size or shape of the cold-water cistern. To calculate the pressure accurately, it is the water level in the cistern that has to be taken as the highest point, and the area or contents of the cistern make no difference. In speaking of the pressure, it was explained that a pipe 2ft. 4½in. (nearly exact) in height and with an internal area of 1sq.in. would hold 1lb. of water. If such a pipe was stood on end and filled with water, its contents (the water) would be pressing down upon whatever supported it, with a pressure or weight of 1lb. If the pipe were twice as high the pressure would be 2lb., and so on in exact increase or decrease as the pipe was higher or lower. If instead of the pipe being one square inch internal area, it was only half this size, its contents would only be ½lb. every 2ft. 4½in., and the pressure on its lower extremity only ½lb. This sounds as if the pressure decreased with the size of the pipe, but it does not, for this less weight only presses on half of a square inch area. Therefore, if a cylinder be fed by a pipe of this size, the pressure internally would be ½lb. upon every half a square inch surface, and a moment's thought shows that this is exactly equal to 1lb. upon each square inch. The same rule applies if we use a larger pipe: the pressure remains the same. A pipe of 2in. causes a pressure of 2lb. (for every 2ft. 4½in. of its height) upon 2in. of surface. The very common and handy way of calculating pressure is to ascertain the vertical distance between the cistern and cylinder, and then allow ½lb. for every foot in height. It is not exact, but it errs on the right side.

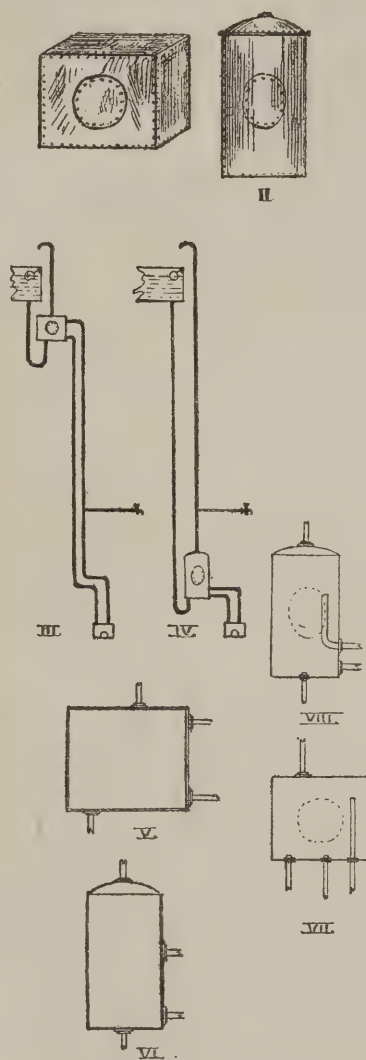
Upon this reasoning it will be seen that the size of the cistern makes no difference, provided the water level is constant. If it were possible to continue the cistern in its entire size down to the cylinder or tank, it will be seen that the pressure of water in this latter article would not vary. There is advantage in having large cisterns and large pipes in the fact that the former insure an abundant supply, and the latter a free flow of water. A small pipe means a slow flow of water, unless the tap be at the bottom of the house. At a bath which is not usually at the bottom level, a sluggish passage of water is an annoyance. The same at a lavatory, or anywhere, in fact.

No hot-water tank or cylinder should be left without covering of some kind to prevent loss of heat. It is occasionally permissible when its radiated warmth is needed for a useful purpose; but let it be clearly understood that whatever heat is radiated is lost from the water—that is to say, the water is lessened in temperature accordingly. It is astonishing what a lot of heat can be transferred from the water in this way when the tank is in a cold roof, and the pipes are in cold situations also. When a tank is in a cold place it loses heat faster than if in a warm situation, and as the object of an apparatus is to furnish water with heat in it, it seems unreasonable to let it be robbed of heat in this way. It is particularly unreasonable, and the reverse of economical, when the radiated heat fulfils no useful purpose whatever.

If we cover a tank with some poor heat conducting material we shall get hot water in less time, keep it hot with less fuel and attention, and, what is a particular advantage, the contents of the tank keep warm all night. This latter is an immense advantage, as it goes far to solve that ever-present problem, how to get hot water the first thing in the morning directly after the fire is lighted. The want of hot water is always most keenly felt in the morning. Most bathing takes place at this time, but as a rule, and chiefly owing to loss of heat by radiation, this is a time in the day when hot water is usually hard to obtain. If we well cover an apparatus with a poor heat-conducting material, we give the boiler every opportunity of doing its work effectually. In addition to this, there will be a noticeable economy of fuel, and if the fire is even allowed to go down for a little while, the heat of the water will not follow its example. The

temperature does not perceptibly fluctuate with the fire.

There are several materials suited for this purpose, all reasonable in cost; but even an old piece or two of felt carpet is not to be despised if the tank is in the roof and appearances of no importance. The nature of the materials must be such that they fulfil the purpose an overcoat does to its wearer; it resists the free passage or radiation of heat. Anything of the nature of felt is suitable, but doubtless hair-felt is the best of these. It being made up in sheets facilitates its application, and its edges can be neatly sewn together. It is made in various ordinary thicknesses from 3-16in. to ½in. The latter is the least that should be used in a single thickness. Properly speaking, the total thickness should be 1in. to fulfil its purpose effectually. Any less thickness means a less effective barrier to waste of heat. A single ½in. thickness is sometimes used, and it does some good, but to say it conserves the heat perfectly is incorrect. To do the



really perfectly, even a 1in. thickness is insufficient. The idea is very common that a single thin sheet of felt suffices, and it does in a limited way; but the thicker application well repays the expense.

As some people have an impression that hair felt is favourable to insect life, it is not always used. There is no other substance so convenient for wrapping round an article as this blanket-like material; but where it is convenient, the tank may be incased with wood, and the space between the metal and woodwork filled in with sawdust or sand. This is very effective, as wood is a very poor conductor of heat. Doubtless, the best material to fill in wood casings is silicite cotton. This material stands high in favour where heat is to be resisted or imprisoned. It is very clean, reasonable in cost, and, provided there is a casing, it is easy of application. It can now be obtained secured on to strips of canvas, which makes it convenient for wrapping purposes. In appearance and texture this mate-

rial is almost precisely like cotton-wool; but it is non-inflammable, consisting, as it does, of silica or glass. Any simple experiment will prove the extremely poor heat-conducting properties of glass.

When a tank or cylinder is placed in a cupboard or casing, and not packed round with any material, there usually appear black puff-like marks against the walls or ceiling where the joints or crevices in the woodwork are. These marks also appear, although not so distinct or defined, above tanks, and also pipes, that are totally uncovered. Inquiry has more than once been made in this paper, and also in the *English Mechanic*, as to the cause of these marks and the remedy or preventive. The cause is easily explained, and is as easily prevented, as the trouble is wholly due to an up-current of air being created by the heated surfaces. This phenomenon might be adduced in evidence of the rapid way tanks and pipes are robbed of heat when unprotected, or in cases devoid of packing material. As explained earlier in this paper, the atmosphere, when it comes in contact with a heated surface is rarefied and caused to take an upward direction, and this up-current is very rapid indeed. (The rapidity is far greater than would be thought without experience of it.) This heated air makes its escape if in a cupboard, from whatever crevices or openings it can find at the top, and in its rapid escape there it impinges upon any surface that may be near. The action is of the nature of a mild blast, and as the air always has particles of dust and impurities suspended in it, a dirty mark ensues. It will be understood that it is not the air that causes the mark referred to, but the dirt particles that are carried in it, and impelled or thrown against the surface.

The remedy is, of course, to prevent the air being rarefied, and to do this it must not have contact with a heated surface. This is effected by covering the tank as recently explained; but as many people put a tank in a cupboard purposely to make an airing-closet for linen, this remedy will not always do. In such an instance effort must be made to perfect the joinery so that no crevices exists; but here we have an enemy in the heat itself, which distorts or shrinks the best of woodwork. After all, there is scarcely anything better for crevices of this kind than common glazier's putty, which behaves well under heat. After the woodwork has well shrunk, stop the crevices with this material, which will endure and answer well if no further shrinkage takes place. If the heat from the tank is not required for a useful purpose, then it should be well covered, and the crevices stopped as well.

A much-disputed point relating to tanks and cylinders is the question of responsibility when one of these articles of good quality leaks after, say, two years' use. They should last in good order longer than this, and in such a case it is not that the tank is worn out, but has a small leakage from a minute pinhole at one point. Examination inside shows that it is only this one spot that is affected, and the total area of the affected part is perhaps only the size of a sixpence, or less. Such a place can be repaired with a soldering iron, provided it is in an accessible position, and in such a case no one would make any trouble about it, although it means half a day's work for a skilled man. When, however, the leakage appears in an awkward spot, and the tank or cylinder has to come down with the work necessary in disconnecting and reconnecting, it makes the hot-water engineer consider whether the responsibility is really his, and then the question arises as to who is liable. It has never to the writer's knowledge been satisfactorily settled as to what is the cause of these little weak spots. The tank-maker is apt to argue that some acid or salt in the water is to be blamed, and this being the case, it relieves him. It is to be feared, however, that the nature of the water is not accountable for the trouble, or, at least, not wholly so, for why is it that only one little spot is affected? It is most probable that the real fact of the matter lies in there being a weak spot in the plate, possibly a point that the galvanising fluid has not acted upon, due to a scale or cinder. It is a difficult point to decide. If the fault showed itself in a few weeks, or even months, the hot-water engineer would probably consider the blame his; but when it is a couple of years, he very naturally feels that he should be relieved of blame, and so the matter ends in an unsatisfactory

way between tradesman and client. If anyone can speak authoritatively on this point, a discussion would be of much utility generally.

The last point to mention, but not the least important one, is as to the size of hot-water reservoirs, tanks, or cylinders. There is a mistaken notion that a large tank (or cylinder) means an ample supply of hot water. This line of argument sounds as if the increased size of the reservoir added by some means to the heating power of the boiler. Engineers with modern ideas are using small tanks and cylinders, not only because they are less expensive, but more efficient and generally agreeable results are attained.

When we use a large reservoir (meaning tank or cylinder), we certainly have a greater bulk of hot water at demand when once it is hot; but this waiting for it to get heated is the great difficulty. It means about three hours in the morning as a rule, unless every possible precaution be taken, and then when at command it is practically useless; the bathing hour is past, and unless the residence be on a large scale, or it be an institution, the large quantity of hot water is never required. What is meant by a large reservoir is one holding, say, 60 gallons—a size commonly used where a 40-gallon would do far better. If a house has one bathroom and two other taps, and there are, say, two or possibly three servants, then a 30-gallon reservoir will suffice. With a larger demand the size is increased proportionately; but if there were two baths, both used at once, and four other taps and a fairly large household, a 52-gallon reservoir would be large enough, and this would need a boot-boiler in a 12in. fire to work it properly.

The advantage of a small reservoir is that results are obtained much quicker under any circumstances. A 35 to 40 gallon size is sufficient for two baths at once, as its contents will probably be scalding hot. Then in a case of bath succeeding bath, the small reservoir has its contents heated up in such short time that it is ready for each succeeding bather, assuming a bath takes twenty minutes. Of course, the first cost is less with the small reservoir, yet the lessened cost does not mean lessened efficiency.

"BUILDING NEWS" DESIGNING CLUB.

LOCAL BOARD OFFICES FOR A VILLAGE.

THIS is a good practical subject, and useful enough when County Council work is developing and Village Councils are talked about. Local Board Offices hitherto, as a rule, have been miserably housed for the most part, and more than often either the offices have been erected without an architect, from builder's plans, or the road surveyor has been engaged to prepare a "design." The problem is an attractive one to the young architect, as affording sufficient scope for inventive fancy without too much trouble; but we are bound to say that out of all the very large number of plans sent in for our first competition in this term of our Designing Club, not one realises exactly what may be called a model type of design. We should do our contributors an injustice if we over-estimated their productions, and while we are constrained to take exception to many of their designs, we are fully alive to the industry and care with which they have done their work. The following were the conditions issued for the guidance of competitors:

A.—Local Board Offices for a country village in a stone district. Site to be an isolated one facing west, with a road frontage on front and right-hand only. Accommodation to comprise office for surveyor, with drawing-office for one clerk. A pair of rooms for the clerk to the local board, one being his public office for inquiries. A rate collector's office and a board-room for ten members, who will sit at a horse-shoe table. W.C.'s and lavatory to be provided, and a caretaker's residence, consisting of living-room, scullery, pantry, w.c., and two bedrooms. The size of the rooms is left to competitors. The board-room to be on the first floor, with the rooms of the clerk to the board. A strong room, 6ft. square, for his use to be provided. Caretaker's door to be at the rear of the premises, and his rooms may be on two floors at the back. Scale 8ft. to the inch. View, two elevations, section, and plan. Plans may be drawn to 16ft. to the inch, if necessary.

"Huguenot" is placed first, "B. gyn. R." comes second, and "Cantab" ranks third. "Clarence" is fourth, and "Kelpie" fifth.

We illustrate the first two designs herewith, and the drawings speak for themselves. It is a curious coincidence that both plans project over the public footway in front of the building, and this is a great objection where public convenience is considered at once, obstructing the pavement, and causing nooks and corners for nuisances to occur. Most of the designs were free from this objection; but still the plans chosen, taking one thing with another, are the best. Architecturally, "Huguenot's" design is dignified by a commendable simplicity, and the bands of coloured stonework serve to bind the composition together, though it is lacking rather in sufficient dignity of appearance outside to suggest its public character. The entrance-door is not important enough, neither is it particularly convenient for general use. The plan is better with the caretaker's residence nicely isolated, and yet readily accessible. Some of the plans are exceedingly faulty in this respect. The surveyor's drawing-office faces north, and the surveyor can get at his room without always passing his assistants. We hardly like the board-room, which is too narrow, and the strong-room cannot be rightly so described, with its match-like front, indeed, it is only an ordinary cupboard, very inconveniently situated. "B. gyn. R." commences well, and endeavours to break away from the regulation hum-drum, "appropriate" type of work. The projection into the street is a mistake as here shown. A forecourt in front of the rate-collector's office would modify the objection by setting the building back! The space occupied by the staircase seems needlessly extensive in so limited a building, and neither the surveyor's nor vestry-clerk's offices look particularly comfortable. The window, too, which lights the hall staircase is insufficient in extent, and being placed in the corner as it is, the window would look one-sided and badly managed. The entrance to the caretaker's house from the offices being through the lavatory, the privacy of the w.c. is destroyed, and in other ways the arrangement is most objectionable, particularly for the woman passing to and from her duties of cleaning the offices. The chairman's room is a mere ante to the superior w.c. The strong-room is located over the front door. "Cantab" gives us perhaps the most sensible elevation of the whole series, and we really like his architecture for its quietness and reflex of old Jacobean English work, inspiring his design with an official character, with well-balanced fenestration and quaint plain gables. His drawings lack crispness, and his perspective, through truthful, is poorly done. The plan does not equal the merit of the elevations, though it is well lighted and straightforward. The chairman so close to the board-room fire would risk a roasting occasionally, and the offices for the clerks and collector do not look comfortably arranged. "Clarence" adopts the style of building with a portico entry, rusticated ground-floor stage and pilasters over, carried up at the angles supporting the cornice all round in a sort of Bath stone and Kentish rag recognised treatment. His plan, however, is very practical and well arranged in so far as its general contrivance is concerned. His drawing-office faces west, however, and the lavatories are too intimately connected with the caretaker's wing to be really nicely managed. A second office is given to the collector, which is hardly necessary, and was not asked for. This design is much more the sort of thing which the ordinary local board member would vote for. Its spacious rooms recommend it, though the local ratepayers would find it expensive. The canted way to the lavatory upstairs cut out of the board-room is a bungle for "Clarence," and being off the quarter landing, would appear as a bulk-head in the council chamber. A false one on the other side makes the balance true. "Kelpie" is a bad planner if this design ranks as a fair specimen of his work. We regret this, as his elevations show taste and a certain sense of fitness. The straight dark passage connecting the main doorway with the caretaker's living-room is ugly, and an interior area to so small a structure, one would think, was needless. The surveyor's office has no north light, and his clerk-room is too small for a drawing-office. The clerk's own apartment is an uncomfortable little place, all window, doors, and fireplace, opening only through either the board-room or clerk's office. The pent over the entrance seems perched up awkwardly. "Lochgill" sends a sensible sort of design, having much to commend it; but the numberless windows give a hospital-ward effect. The

plan, without waste of room, is spacious and convenient, though the caretaker should have had a better entrance to his house than through the scullery. His only other outlet is by way of the office entrance, which is not always convenient. The drawings of this design are well arranged and neatly done. A little more spirit infused into the composition would have enabled us to place it higher. This doubtless "Lochgill" will give us a chance of doing another time. "Dunottar" forwards a commonplace design; but he has, by quaintly grouping pilasters along the façades, imparted a somewhat fresh character, and enhanced the expense. The surveyor is put facing south, which upsets the north light for the drawing-office. The staircase is more reasonable in scale, and the ante-room to the board-room gives a little space for members' hats and cloaks behind the grand columns, for there is no other cloak-room accommodation. The two first designs do give some convenience in this respect. "Ecosse" is a compact and neat planner, though he does not sufficiently consider relative values. His Jacobean sort of design looks crude and wanting in refinement. The plan shows a drawing-office facing east, a hall which would not be too light, and a caretaker's house which could not be reckoned upon for comfort. The extreme care displayed by these drawings indicates unmistakably that "Ecosse" means to do his best and improve. He draws neatly and prints well. "Black Diamond" makes a pretty elevation, looking more like a comfortable tavern with its row of four gables in timber work. The suggested detail is refined and marked by study, but the plan does not harmonise nicely with the external treatment, with the thin division walls coming anyhow, and necessarily, therefore, mostly in timber quarterings. The arrangements, too, are crude, which is a pity while "Black Diamond" has so appreciative a sense of proportion in his façades. His perspective is weak and thinly delineated. "Offside" makes his long side of the building face west, bringing a bay window out into the pavement. The façade is prettily managed, but there is a great waste of space in the entrance hall and landing over it. "Offside" will do better than this. "Shylock" ("be not too shy!") puts his motto so small in the curve of a scroll, that we could scarcely find it. This design is intended to be "Classic," and has good points in the plan, but the bad ones predominate. The awkward starting to the curved staircase fitting in a square angle is enough to condemn any plan. "Classic" is the motto of the next design, which in style is more free German Renaissance quaintly managed, ingeniously contrived, but terribly crowded, both on plan as well as elevation. "Classic" merits praise for an endeavour at originality. "Rex Tab" has a rough-cast upper stage and a speech closet (it is called a "gallery") leading to a little balcony over the main entrance, a fitting place from whence to address the "free and independent" or the "unemployed," as circumstances might dictate. The drawings are neat, but this plan, though spacious, is wasteful, with rooms of ugly proportions. The detail suggested by the elevations shows that "Rex Tab" has studied good work. The hall, depending on a small roof glazing, would be not light enough. "Red Lion" thinks the ponderous Georgian style most suitable, and to avoid its looking too formal, draws his perspective in the "flick and dot" manner, to give it an airy appearance. We rather like his essay, but do not see where the top light, on which the hall and staircase depend, comes in. A sloping casement would cut into the valley made by the rear roof intersecting that of the main building. The surveyor's office faces south. "Baboo" has rather pretty Old English-looking elevations, carefully drawn. "Ecco, Fatto" falsifies his design in his view of it. "The Idler" draws coarsely, and is untidy, but has a sense of quaint design of the better sort. He ought really to do better. "North Wind" nearly scores, and is not afraid of plain walling, which always looks well, but his plan is wasteful. "Ben" is sketchy, and makes a sensible-looking building, but his knocked-off plan is wanting in study. Thus the space for the "public" behind the chairman in the board-room would never do. The regulation malcontent ratepayer in such a position would be worse than the fireplace in "Cantab's" design. "Spare Moments" prepares a half-timber design, with a spire at the angle over a corbelled tower bay, which comes inconveniently

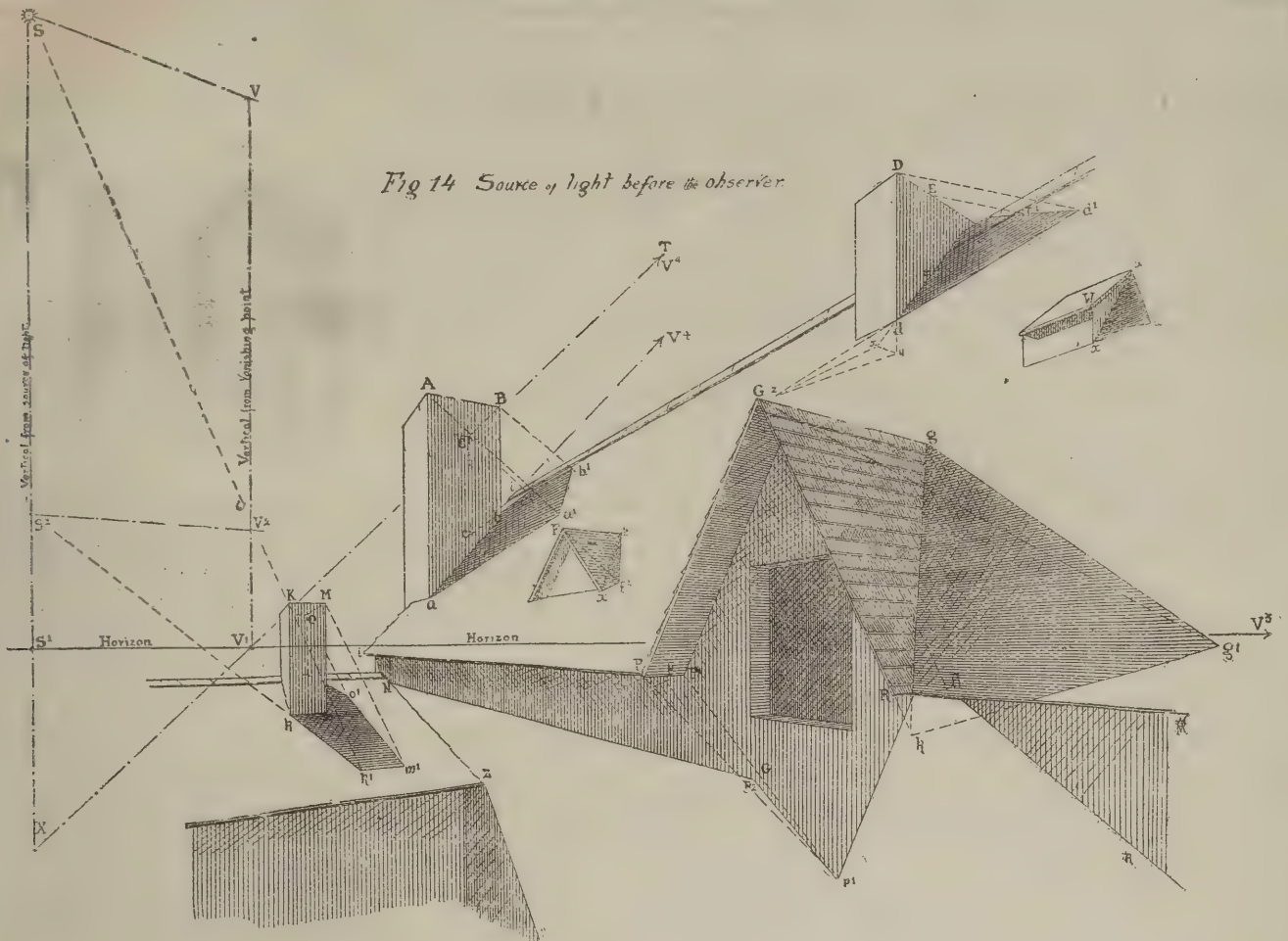


Fig. 14 Source of light before the observer.

out of the staircase. The plan has merits, but the elevations look more suited to a free library. "Tit Willow's" design is overdone, and the drawing-office faces S.W. "Triangle's" elevation, with its conical roof, would group well, and the oriel windows seem suitable. The plan is consumed with corridor space, which is enlivened with w.c.'s opening out of it publicly. "Cyclist's" plan is economical, and marked by a plain tower outside; it is drawn to resemble a villa of the pattern-book kind. "Hardwick" has a pretty side elevation copied from some old work, probably in Northants; but the front does not accord well with it, while the plan has to be managed to fit into the bays. "Heather" comes next with an inky perspective, and then "Signor McStinger," with a squat tower projecting on to the public path, and inclosing the main staircase. "Farnden" adds a circular tower of Scotch variety. "Compact" is the motto of a design extended to double the width of its competitors. "E. T. I." is severe Queen Anne, which actually would look far better than the drawings allow, for they are miserably poor and scratchy. "Hug" makes his elevations too much like a board school, but his drawings are exceedingly neat. The drawing-office faces west. "Carlos" does the same, and "Cleopatra," with a freedom of idea, makes his elevations look high-shouldered. He should make an advance upon this effort. "L" in a circle puts a double bay quaintly in front of his building to mark the staircase.

The following are the mottoes of the remaining designs in their order of merit:—"Aliquis," "The Odd Man," "Benihassan," "Grace," "Big Ben," "Bobadil," "Mysorum Ultimus," "Wacota," "Bos," "La Crosse," "Symple Symone," "Royerus," "Sigurd the Viking" (Cardiff), "Wyandotte," "X. Y. Z.," "Hopeful," "Sweet Auburn," "Arnaud," "Sigurd the Viking" (Swansea), "Mosquito," "Perseverance," "May," "Parabola," "Nero," "Young Architect," "Veritas Vincit," "Signorenia," "Toreador," "Wigwam," "Cigarette," "Tyro," "Lulworth," "Me," "Edelweiss," "Vril," "La Cigale," "Jim," "Spero," "Rex," "Lotus," "What Mergorem," "Caenabo," "Ajax," "Ares," "Kohi-

noor," "Durability," and "Mac." "Duke" and "Billy" came in too late, but neither merit special comment; and "Duke," regardless of rules, sends in three sheets of paper of various sizes.

SHADOWS IN PERSPECTIVE.—VII.

THE rays of light still come from before the observer, and from any point in the sky, where we suppose the source of light to be situated. In the last example we studied the shadows thrown by vertical or horizontal planes against other vertical or horizontal planes. In the present example (Fig. 14) we will construct the shadows thrown by oblique and vertical planes, such as those of a chimney or dormer, against the sloping plane of a roof. The student should now be able to construct the ordinary shadows thrown by vertical and horizontal planes. If he has carefully followed the rules, and well understood the reasoning, he should find little difficulty in understanding the construction of the shadows in Fig. 14, which are most important.

In the last example the drawing was in parallel perspective. Fig. 14 is in ordinary perspective with the vanishing points. The drawing appears slightly distorted, for, in order to have at least one of the vanishing points within the figure, to explain the constructional lines, it was necessary to make the perspective very short. The vanishing point V1 should be much more to the left, and the point indicating the source of light, S1, should be placed at a larger distance to the left of point V, in order to obtain well-proportioned shadows. The placing of these points is, of course, a question of habit and good taste, and depends on the effect desired and the general mass of the architecture. The drawing is kept very simple in order to better explain the working.

The vanishing point of the large roof is at V1 on the horizontal line, the other vanishing point being in the direction V3 to the right of the drawing. The sun, or source of light, we will place at S, its projection on the horizontal line being at S1. The vertical projection of the vanishing point V1 will be at V on the line drawn from S to the vanishing point V3. The

reason and position of this point V was explained in the last article. We will first find the shadow thrown by the small chimney KM against the descending slope of the small roof. The angle of this roof gives us for its aerial vanishing point the point V2 on the line projecting V1, and the corresponding point on the line projecting point S is at S2 on the line from the vanishing point V3 through V2. If the roof was horizontal, we should, as in previous examples, use the point S1 on the horizontal plane for constructing the lower lines of the shadow; but as the roof makes an angle with the horizontal plane, we have to use the point S2 on the continuation of this plane for the constructional lines. It is easy to see that the plane S, k1, S2, containing the rays of light, and passing by the vertical line of the chimney KM, rests on the roof plane on the line k1; k1 is therefore the shadow line of KM. The same plane or lines from S and S1 passed through Oo and Mm will give us the line Oo1, the shadow line of Oo, and m1 the shadow point of point M. The shadow of the chimney is, therefore, contained by the lines O, o1, m1, k1, k.

Let us now find the shadows cast against the large roof plane. We take the chimney Dd. The constructional method is similar to that employed for parallel rays in Figs. 10 and 11—that is to say, we find the plane dyx perpendicular to the roof lines, and a continuation of the plane dDe, and by means of lines from y and x to the points V1 and S1 meeting at z, obtain the plane dyz in the plane of the rays of light; the continuation of zd to d1, where it meets the light line from S, passing through point D, gives us dd1, the shadow line of Dd. The student should refer back to Figs. 10 and 11, where this construction is explained. But as this process would be tedious, and necessitate too many constructional lines if the shadows were numerous, we will employ a simpler method of obtaining the shadow lines of vertical objects by means of one given point, and thus insure rapidity and correctness in putting in the shadows. The aerial vanishing point of the smaller roof we know to be at point V2 and S2 on the vertical from the source of light. S2 is the point from which we have drawn the shadow lines of the chimney KM.

In a similar manner, the aerial vanishing point of the larger roof will be on the vertical line projecting the second vanishing point V 3, and its height will depend on the angle given to the slope of the roof. All the upward lines of the roof, such as $ab, de, xx, ii, &c.$, should converge to a given point on the line projecting vertically the vanishing point V 3—that is, in the direction V 4. This point is outside the limits of the drawing. Given the slope of the roof, if we suppose the roof to be continued as far as its vanishing point, V 1, the angle of the roof at this point would be represented by the line V 1, V 4, or the line joining the vanishing point V 1 and the aerial vanishing point V 4. If we produce this line until it meets the line S, S 1 produced, we obtain the point X and the plane S, X, V 4 containing the rays of light. If now we revolve this plane S, X, V 4 about its axis SX, the line XV 4 will pass along the surface of the roof, and by its means we may determine the shadow lines of the vertical lines of the chimneys P, exactly as for shadows on the ground plane, we use the point S 1, situated on the ground plane, as point X is situated on the plane of the roof produced; therefore, to obtain the shadow lines of Aa, Bb, Cc , we pass lines by the lower points a, b, c from the point X, and determine their length by means of the light lines from S passing through the upper points A, B, C. Similarly, we find $d, d 1$ the shadow line of D d: likewise $e 1$ the shadow point of a point E; the line joining $d 1, e 1$ produced is the shadow line of DE. This construction is correct, for we obtain the same shadow as with the construction dyz . Point w is obtained in a similar manner, and wx joined gives us the shadow of Wx. The shadow of the large dormer Gg is obtained by means of the line from X passing through the lower point G, and its intersection with the light line from S through G, giving us $g 1$ as the shadow of G; $g 1, g$ will, of course, be the shadow line of Gg. The line joining $g 1$ and the point k gives us the shadow of Gk, a portion only of which is thrown against the roof.

But we will notice that the shadows of all the horizontal lines of the chimneys and dormers converge to a certain point, the lines $f 1, f; a 1, b 1; d 1, e 1; g 1, g, &c.$, all converge to a point T on the line joining S and the vanishing point V 3; therefore, by means of these two points, X and T, we may obtain nearly all the shadow lines of the various objects, thus enabling us to put in very rapidly and with perfect correctness any number of shadows, and avoiding the number of constructional lines otherwise necessary. The student will find no difficulty in obtaining these two points if his perspective has been correctly drawn. The shadows thrown by parallel rays in Fig. 10 also follow the same rules. The student should refer back, and find the shadows of Fig. 10 by means of two similar points.

The shadows of the eaves is easily found; that of P, P 1 will be at $p 1$, the intersection of lines from S and V through P and P 1; $p 2$ is the shadow of point p . RR throws its shadow in the direction Rr from the point V. This shadow continues to the right; the portion of the shadow of G R which is not cast against the roof plane is outside the drawing and against the wall plane. The eaves z cast a shadow in the direction zy from the point V. ARTHUR VIE-PARMINTER.

THE ELECTRIC LIGHTING OF GLASGOW.

IN February next the municipal authorities of Glasgow will enter practically upon the work of supplying electricity to the public for lighting purposes, and it is proposed to light, almost simultaneously, some of the thoroughfares with the new illuminant. At present the scheme is restricted to the central district of the city—from Glasgow-cross in the east to a short distance beyond Charing-cross in the west, and from the Broomielaw in the south to Sauchiehall-street in the north. The corporation have acquired, as a site for a generating station, a square piece of ground at the corner of Waterloo-street and Mains-street, at a corner of about £9,000. On this they have erected, at an additional outlay of nearly £12,000, a structure of three stories, with a frontage of 90ft. to Waterloo-street and 40ft. to Mains-street. The main walls are of stone, the division walls are of brick, and the floors of concrete on iron girders, while iron is employed for the support of the roofs. From the east end of this building a two-story wing goes back a length of about 50ft. at right angles. In its basement floor are five steel tubular boilers of

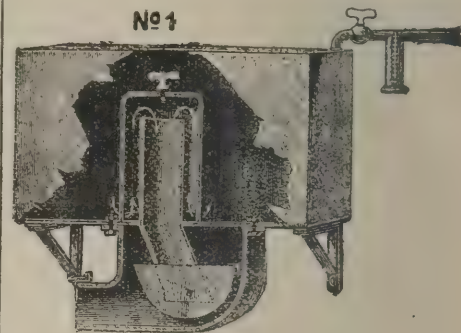
marine type, and on the floor above there are the storage batteries, of which there are two tiers of 57 cells each. The smoke from the furnaces is carried off by a circular brick stalk 14ft. in height. It is intended to utilise the remaining portion of the site for additional boiler-sheds as the scheme expands. Of the main building, the two upper floors are reserved for offices, the storage of materials, and various minor purposes. The working plant is erected in the basement floor, and will be sufficient to supply 12,000 incandescent lamps of eight candle-power for shop and domestic purposes. The Corporation have adopted the low-tension direct current. The total sum expended on the present installation will amount to about £60,000. It is calculated that the annual outlay for the electric light in the streets operated upon will exceed the annual cost of the gas light by about £500. Professor A. B. W. Kennedy, London, was entrusted by the Corporation with the planning of the whole installation, and the execution of the plans have been superintended by Mr. William Arnot, whom the Corporation appointed as their electrical engineer. Mr. John Porter, Janefield Works, erected the building in Waterloo-street; Messrs. Latimer, Clark, Muirhead, and Co., London, supply the engines, dynamos, pipes, &c. (Messrs. Willans and Robinson, London, constructing the engines as a sub-contract); Messrs. Blakey and Emmott, Halifax, furnish the switchboard; and the accumulators come from the Crompton-Howell Electrical Storage Company.

TOWERS AND STEEPLES.

A LECTURE upon towers and steeples was given at the London Institution on Monday evening by Mr. Arnold B. Mitchell, A.R.I.B.A., of Birmingham, who illustrated his address by a number of lantern photographs taken expressly for the occasion of the various buildings mentioned. The lecturer began by exhibiting a ground-plan of Canterbury Cathedral, pointing out the difference between the two western towers dominating the principal approach to the structure and the grand central tower which was the glory of the fabric. He showed what great difficulties had to be overcome in erecting such an enormous mass of masonry over the open arches upon which, owing to the intersection of the nave and transepts, it was necessary it should be built—difficulties which would account for the fall of some of these towers, for

experienced in consequence of the fouling of the trough from defective formation, and the failure of the flush tank.

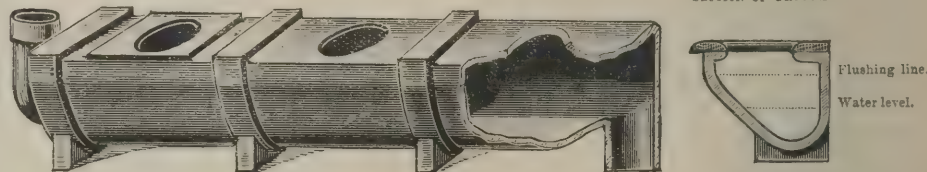
The tank here illustrated has neither air-holes nor small pipes, which, as was proved by the



Sheffield Corporation trials, wherever present, choke up and stop the action. It is self-trapping, and untraps at the end of every flush, will work equally well with clean or dirty water, and when used with waste water for flushing drains requires no grease trap. The action is as follows:—There is placed below the tank a tumbler or tipping bucket, into which the long leg of siphon dips, reaching nearly to the bottom. When the water in the cistern rises to the bend of the siphon, it runs down the long leg into the tumbler, thus trapping the siphon and confining the air contained in it. As a consequence, the water in the cistern rises above the bend of the siphon in about the same proportion as in the tumbler. When the tank is filled, the tumbler also is filled to its tipping point, and it discharges its contents, unsealing the siphon, which is instantaneously charged by the head of water in the cistern. The tumbler remains tipped until the finish of flush, when the air passes up into the siphon, effectually unisiphoning it, thus dispensing with the usual leak-off holes or small siphons.

The Sheffield trials proved that this tank could not be put out of order without actual destruction.

The trough is egg-shaped, and has a straight back and front, which gives the flush the greatest scouring power. The rear is set well back from the seat to escape fouling. As a



the devices it had been necessary to invent to keep others intact after they had been finished, and for the fact that the central tower of Westminster Abbey had never been finished. The latter Abbey had the highest roof of any ecclesiastical edifice in England, and its architects found that it would be unsafe to continue the erection over the choir of the central tower, which it would have been necessary to carry up to a great height. Mr. Mitchell traced the gradual growth of the tower from Saxon times, and showed how it became more and more stately and beautiful during the Norman period, and on through the 12th and 13th centuries, until the spire was gradually evolved from the low pyramidal roof which formed the top of the tower. He explained how the steeple went on growing in beauty and grandeur of design through the 14th into the 15th century, when, for some inexplicable reason, the spire was altogether abandoned; but to compensate for the loss, the upper part of the tower was made very ornate, a peculiarity of the Perpendicular style. As an illustration, he showed a photograph of the tower of Magdalene, Cambridge, a most beautiful example, with a wondrous sky-line.

MERRILL'S PATENT FLUSH TANK AND TROUGH CLOSET.

THESE have been designed with the object of providing a thoroughly reliable automatic flushing closet, without the drawbacks hitherto

result of this method of construction, a considerable depth of water is retained in the trough, and the flush rises steadily to the top of trough, as shown by the dotted lines on section, effectually scouring it. They are manufactured by the Water Carriage Engineering Co., Limited, Sheffield.

The friends of the Mayor of Sheffield, Alderman Batty Langley—whose name will recall a past race of architects—received from him and the Mayoress a Christmas card which is the result of a competition amongst some of the students at the Sheffield School of Art for prizes offered by him for the best designs. That selected as being the best is the work of Miss A. Kershaw, who is the holder of a £20 scholarship from the Art Department at South Kensington.

Plans for a proposed new mechanics' institute and technical school at Ripon have been prepared by Mr. George Styant, architect, St. Helen's Chambers, York, and consulting surveyor of the city of York. The site is in Finkle-street, adjoining the old market-place. The front of the building will be of Leeds pressed bricks, with stone dressings. On the left of the entrance is the library and bank-room, 27ft. by 16ft. There is to be schoolroom 50ft. by 30ft., and also a cookery-class kitchen and work-room, each 25ft. by 20ft., in the yard. On the first floor are the reading-room, 29ft. by 24ft.; committee-room, 16ft. by 18ft.; billiard-room (two tables), 30ft. by 22ft.; and two committee-rooms. The second floor provides bedrooms, and the basement caretaker's rooms.

CONTENTS.

Details and Tenders	901
Building By-laws	902
Iron Arches of Large Span—V.	902
Stability of Walls on Soils—X.	903
Cylinders and Tanks for Hot-water Works	906
BUILDING NEWS Designing Club	908
Shadows in Perspective—VII.	909
The Electric Lighting of Glasgow	910
Towers and Steeples	910
Merrill's Patent Flush Tank and Trough Closet	911
Our Illustrations	911
Competitions	911
The Dubrot Brick and Tile Iron Frame	911
The BUILDING NEWS Directory	911
Wayside Notes	930
Obituary	930
Prices.—LIII.	931
Theatres.—XV.	932
Cottages, Preston Brook	934
Cottage Hospital, Galashiels	934
Engineering Notes	934
Building Intelligence	936
Correspondence	936
Architectural and Archeological Societies	936
Intercommunication	937
Legal	937
Legal Intelligence	937
Water Supply and Sanitary Matters	937
Our Office Table	938
Meeting for the Ensuing Week	938
Trade News	938
Tenders	939

ILLUSTRATIONS.

RESIDENTIAL FLATS, MORPETH-TERRACE, S.W.—NORTH WALES TRAINING COLLEGE, BANGOR.—SALISBURY CATHEDRAL SPIRE, FROM THE BISHOP'S GARDEN.—"BUILDING NEWS" DESIGNING CLUB: DESIGNS FOR LOCAL BOARD OFFICES FOR A VILLAGE.—ST. PHILIP'S CHURCH, STEPNEY.

Our Illustrations.

RESIDENTIAL FLATS, MORPETH TERRACE, S.W.

MR. GEO. BAINES, of 4, Great Winchester-street, E.C., is the architect of these flats, but no further particulars have reached us.

NORTH WALES TRAINING COLLEGE, BANGOR.

IN December of last year the North Wales Training College, which has, since its establishment half a century ago, been located at Carnarvon, was partially destroyed by fire, and the Committee of Management, which includes the Bishops of Bangor and St. Asaph, then took into consideration the desirability of not only rebuilding the college, but of its removal to Bangor, which city has, since its selection as the seat of the University College of North Wales, been regarded as the natural educational centre of the four northern counties of the Principality. At a meeting held at St. Asaph early in the present year it was decided to erect new buildings at Bangor. With this object in view, the committee invited four architects to submit plans in competition. Out of these two designs were referred to a sub-committee to examine (with the aid of professional advice) and report upon. Acting upon the recommendation of this sub-committee, the plans submitted by Mr. Robert Grierson, architect, Bangor, were unanimously adopted by the Committee of Management. Tenders for the work were invited by public advertisement, to which eleven firms of builders responded, and at a meeting held last week the tender of Messrs. Parnell and Son, Rugby, amounting to £3,417, was accepted. This contract does not include fittings and furniture, which, together with boundary walls, will probably amount to a further sum of £2,000. The site selected for the new buildings, and which has been generously given by Lord Penrhyn, immediately overlooks High-street, and the new buildings will form a prominent architectural feature in the general view of the city, as it is approached from the railway station. The principal entrance will be from a terrace, which will crown the brow of the hill which forms the southern side of High-street at this point, and along which the buildings will extend upwards of 200ft. The walling will be of local blue stone, with Cefn stone dressings. It is expected that the college buildings will be completed in time for the students and staff to enter into occupation between terms early in January, 1894. Great credit is due to the Rev. J. Fairchild, the Principal of the college, for his exertions in collecting subscriptions towards the new buildings, and in generally placing before the public the value of such an institution in North Wales.

SARUM SPIRE FROM THE BISHOP'S GARDEN.

TO-DAY we give a pencil sketch of the "Silent finger" of Salisbury Cathedral, which is almost exactly of the same height as the spire of Antwerp Cathedral, of which we gave a view last week. The last mentioned is much later in date and very different in conception and design, though both are marked by extreme delicacy and refinement. These are essentially the characteristics of the spire at Salisbury, which, besides being the loftiest in England, is perhaps the most beautifully proportioned spire in the world. It dates from A.D. 1331. Norwich spire is 313ft. high, and Chichester is 271ft. to the finial; but Salisbury measures 400ft. above the pavement, or 30ft. above the top of St. Paul's. Strasburg, the highest in the world, is 463ft. high, and the flèche at Amiens measures 422ft.; while Antwerp is 404ft. high. The drawing which we illustrate is a delicate pencil study by Mr. Charles Spooner.

"BUILDING NEWS" DESIGNING CLUB: LOCAL BOARD OFFICES FOR A VILLAGE.

(See description on p. 908.)

ST. PHILIP'S CHURCH, STEPNEY.

THIS double-page illustration finishes our series of detail and other drawings representing this church, which has appeared in the BUILDING NEWS during the past two months. The sheet shows the bays of the choir and apse, with a half-plan of the sanctuary, whereon the dotted lines indicate the planning and contours of the groining. Mr. Arthur Cawston, A.R.I.B.A., is the architect.

COMPETITIONS.

MULREADY PRIZE.—The council of the Society of Arts offer, under the terms of the Mulready Trust, a gold medal, or a prize of £20, for competition amongst students of the schools of art, at the annual National Competition held in 1893. The prize is offered to the student who obtains the highest awards in the following subjects: (a) A finished drawing of imperial size from the nude living model; (b) a set of time studies from the nude living model (mounted on imperial size mounts); (c) a set of studies of hands and feet from the living model (mounted on imperial size mounts); (d) drawing from the life, done at the examination on May 11, 1893. No student will be eligible for the award who does not pass in the examination (d) in drawing from the life, and who does not obtain an award for (a) the finished drawing of imperial size from the nude living model. The other two subjects are optional. The works must be those of the previous school year. The drawings are to be submitted, with other school works, in the usual manner to the Department of Science and Art, in April, 1893. Each competing drawing must be marked "In competition for the Mulready Prize," in addition to being labelled according to the regulations of the Department of Science and Art.

CHIPS.

The London County Council have deposited in the Private Bill Office a Bill for the removal of 65 obstructions to traffic in the shape of gates and bars in different parts of the metropolis.

The South Kensington Museum has recently obtained by purchase the Venetian marbles acquired by the late Mr. Cavendish Bentinck. These have been divided between the London, Edinburgh, and Dublin Museums—the last two having contributed to the purchase by grants from their respective funds. Another addition to the architectural collection is the plaster cast of the doorway of the Cathedral of Aix, in the south of France.

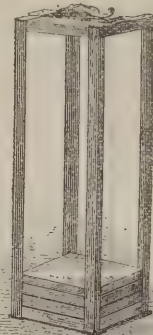
A statue of the Queen in a sitting position was erected last week opposite the Horse Guards, in the vacant space where Carrington House once stood, next to the Chapel Royal. The statue is only temporarily placed there, as it is to be sent to Hong-kong as a Jubilee monument of Her Majesty. It has been executed by Signor Raggi.

The School Board for Carlisle have instructed Mr. T. Taylor Scott, of that city, to prepare plans for a school, in two departments, to be built in Ashley-street.

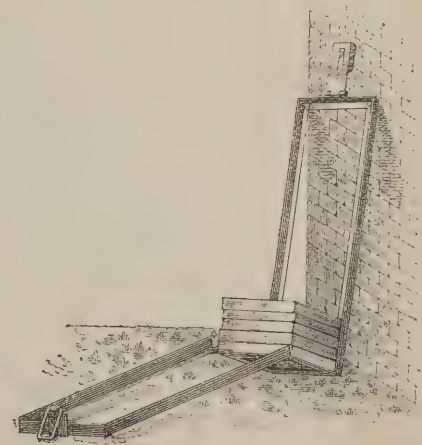
A workmen's supper to commemorate the successful raising of the topmost stone of the new church, now in course of erection at Budleigh Salterton, took place at the Rolle Hotel, in that town, on Wednesday week, and was attended by some 40 of the men engaged on the works, under Messrs. Luscombe and Sons, of Exeter, the contractors.

THE DUBROT BRICK AND TILE IRON FRAME.

THIS is a new invention for saving time and breakages in the transport of bricks and tiles which has just been patented by Mr. Dubrot. It is an iron frame like the annexed



figure, holds many bricks and tiles, and allows them to be passed very rapidly if several removals are required. Among its advantages are the following:—(a) It protects the corners of the bricks and tiles from being chipped. (b) It is



quickly fastened and unfastened. (c) It closes into a very small compass for storage. (d) It is easily handled. (e) May be had in any size. The patentee is Mr. Vautier, 29, Halsey-street, London, S.W.

The old and well-known firm of Messrs. Measures Bros. and Co., of 57, Southwark-street, was registered on the 19th inst. as a limited company under the title of "Measures Bros., Limited." We may successfully predict a well-deserved continuance for the new company of the confidence and success the old firm has so long and so justly enjoyed.

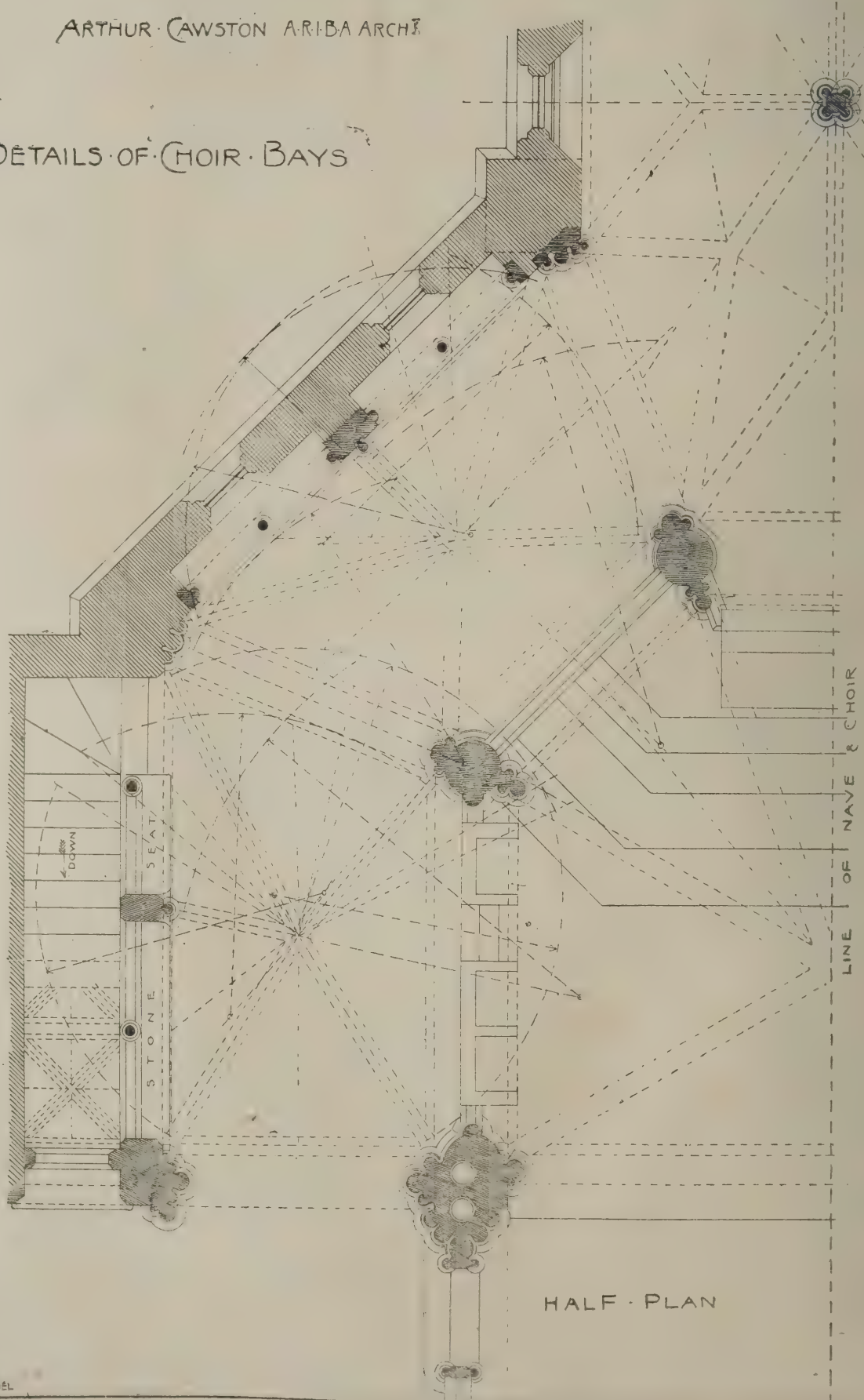
At Rushall, near Tunbridge Wells, a public inquiry was held on Friday by Major-General C. Phipps Carey, C.E., one of the inspectors of the Local Government Board, respecting the application of the Rushall rural sanitary authority for sanction to borrow £800 for works of private street improvement, and £700 for sewerage and surface water drainage for Speldhurst. Mr. W. Oakley, surveyor to the authority, explained the plans and sections.

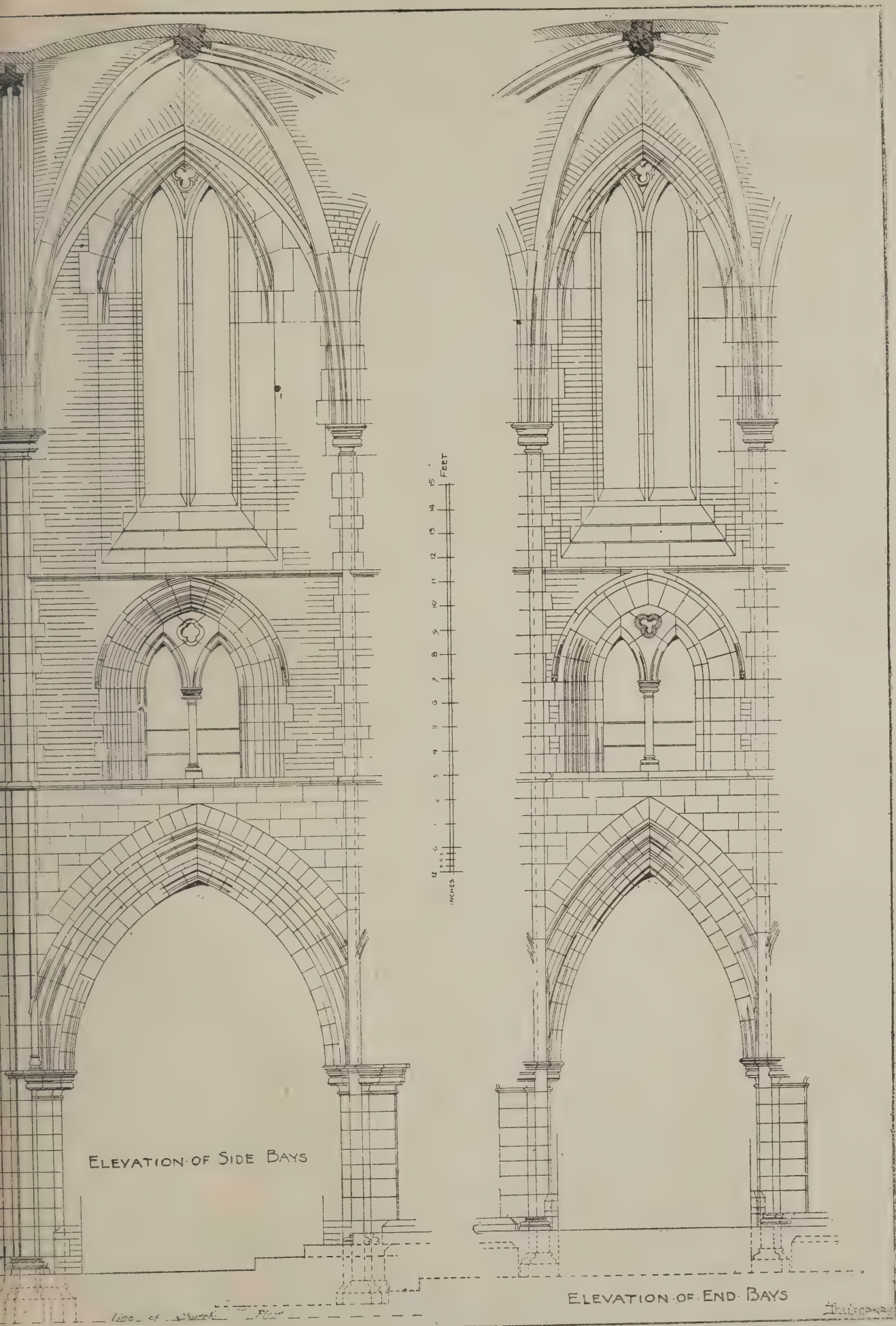
Mr. John Hutchinson, R.S.A., has just completed in the clay the statue of the Regent Moray, which is to adorn one of the niches in front of the Scottish National Portrait Gallery, Queen-street, Edinburgh. The figure is 6ft. 6in. in height. The Good Regent, attired in doublet and hose, wears on his head a soft velvet cap. His right hand grasps a State paper, while his left is at his waist-belt. The head, studied from the Holyrood portrait, shows the Regent in the flower of manhood, with moustache and pointed beard. The figure, which will be carved in red stone, is the gift of the Earl of Moray.

ST PHILIPS · CHURCH · · STEPNEY · E

ARTHUR · CAWSTON · A.R.I.B.A. ARCHT

DETAILS · OF · CHOIR · BAYS





WAYSIDE NOTES.

NO further information is forthcoming with regard to the proposed competition for a London board school. Presumably, the Board are preparing a set of conditions for architects. The action of the Board has been freely condemned, and one certainly feels that the chief idea of the competition from the point of view of the promoters is the gaining of new ideas at a small outlay for premiums. In which case it will be as well if the premiums proposed are of liberal amounts, and at least as much as those suggested by General Moberley, viz., £150, £100, and £50. I hope that the School Board will soon issue particulars for this competition, as its course and result will be interesting to watch.

An excellent thing will be the proposed Workman's Exhibition, to be held at the Agricultural Hall in June and July next year. Anything that will encourage workmen to take an interest in their work is good. An exhibition of the nature proposed should not fail to do some little to forward this end. I trust that the building trades will be largely represented.

In writing of the County Council as concerned with the question of open spaces in London, I was not aware of the extent and scope of the Bill that the Council has deposited in the Private Bill office of the House of Commons. This measure is devoted solely to the question of open spaces, and is divided into eight parts. In Part II. it is proposed to vest absolutely in the Council the fee simple of Hackney Marshes, to which end it is in contemplation to compensate commoners and others possessing beneficial rights in these marshes, at an estimated cost of £75,000. In Part III. the Council propose to acquire the management of, and to maintain, Lincoln's Inn-fields. Part IV. is of an eminently progressive character. It proposes to manage and maintain the Albert Palace for the use and recreation of the people. In Part V. the architect becomes interested, dealing, as this section does, with a proposal to acquire, for the purposes of preserving "as an object of interest," the ancient York Water-gate, the familiar object at the bottom of Buckingham-street, Strand. Power also is sought to acquire some vacant ground adjoining—said to have been formerly part of the terrace walk leading to the gate—at a cost of £1,000. In Part VI. powers are sought to enable the Council to acquire so much of Hilly Fields, Brockley, as will secure not less than 41 acres of land as an open space for public recreation. The first part of the Bill and the remaining sections deal with preliminary matters of form, the making of an additional entrance to Brockwell Park at a cost of £500, and various clauses necessary to carry out the powers mentioned.

Hackney Marshes are to me a memory of gloomy, fog-laden levels, most remarkable as being a free northern outlet for the smoke of Stratford factories; but there are doubtless some clear, sunny days even in this generally cheerless suburb of London. They may, therefore, prove worth acquisition, although the sum of £75,000 seems vastly too much to expend on so unlovely a spot. As to the York Water Gate, it is to be hoped that no ill-advised scheme of restoration is in the mind of the Council. Some time has elapsed since I last passed this pleasing old relic; but it is now, doubtless, as it ever was, sturdy in appearance and sound in condition. Once there was talk about the condition of the keystone of the central arch, but this was probably looked to long ago. All the Council will need to do will be to repair and remedy any signs of structural dilapidation. There is yet a lot of wear in this chubby piece of Renaissance architecture.

Readers may have noticed an amusing *Globe* "turnover" a few evenings before Christmas, entitled "On Building a House." I should think that a more complete heading would have had, further:—"By One who never Built a House, but Writes from his Imagination." Nevertheless, there was much to tickle the architect's fancy in the article. As to the question of architect, "shall it be the well-known Mr. Oriol, of Mediæval propensities, or Sir Inigo Gargoyl, whose red-brick and timber constructions recall the 'times of Great Elizabeth,' or 'days of good Queen Anna'?" And further, "as to the architect, one would be quite as safe with such and such a famous person, provided he

would condescend to do his best; but is not he almost too grand? When he built a house for poor X. Y. Z.'s, he went down only once for half an hour to look at it. There is his favourite pupil, Mr. Octagon, to be sure, just setting up for himself, but it seems rather rash to become the subject of his maiden effort; but then, again, he would take such pains." In the course of the progress of the works, "if you are domiciled close at hand you bring over all the friends who will sacrifice themselves, and delight to pioneer them over rickety planks and through swamps of mud, and induce them to mount a tottering ladder to obtain a clear idea of the exact elevation of the kitchen chimney." In questions of taste, "the architect is serenely complacent. You offer a timid suggestion, which you flatter yourself really is well thought out. He is 'afraid he doesn't see it,' and smiles leniently, but with a covert contempt." After all, the troubles a housebuilder goes through, we are relieved to hear that you "end by becoming very fond of your house, in spite of all its faults and shortcomings."

Harlow Church, Essex, to which I referred last week as about to be rebuilt so far as concerns the nave and tower, is, I suppose, one of those typical churches of the North-west Essex district with a massive square tower surmounted by a sharp spike of a spire rising abruptly from the square parapets, with a base much smaller than the top of the tower, the full blunt square forming a quaint and pleasing contrast to the spiny sharpness of the spire. On Friday, having to journey to Cambridge, I passed Harlow, but did not awaken to the fact soon enough to notice the church (if visible), and when I returned in the evening it was dark. By the way, what a charming old place is Newport, close by! Its curious old whitewashed cottages, with thatched and tiled roofs and elaborate cut-brick chimneys, are well seen from the railway. One house is, I believe, reputed to have been occupied by Nell Gwynne.

In passing through Oxford on my way to Shropshire the other day, I noticed the scaffolding around St. Mary's tower. When Mr. Jackson has completed the work of restoring the tower, and the scaffolding can be cleared away again, the general Oxford skyline will be improved.

Wren's Westminster towers have again come forward. I am inclined to agree generally with "C. F. M." The absurd mania—now, I trust, dying out—for restoring back to certain dates, is certainly falsifying history to no insignificant extent. There is just one other side, however, on the question of the conduct of Wren in putting on quasi-Gothic towers to the old 15th century stumps. As a whole front the effect is doubtless displeasing to most architects. It is quite likely that Sir Christopher thought he had accomplished some very excellent Gothic work indeed when he had added these towers; but we now see there is not an atom of Gothic spirit in this design. Completing a tower is not like adding an aisle. If unfinished towers are never to be completed, we should have been without some of the finest Continental examples, which, begun in the Middle Ages, have, comparatively speaking, been only recently completed.

Your article and "Clerk of Works' " letter open a subject of discussion always of interest to architects. There is room for considerable individuality in the matter of a choice of scale; but as workmen and foremen get accustomed to certain scales, it would seem best that there should be some understood, if unwritten, agreement among architects on this point. One-eighth, one-half, and full-size are the most useful for ordinary work. From the builders' point of view a quarter-inch to the foot is a desirable scale for the general plans; but in a busy architect's office one-eighth inch to the foot is the only practical scale. Certain works may demand a larger scale, both for general plans and details. A small work requiring special attention will necessitate quarter-inch and one-inch respectively. Fads in this way should be avoided. We have had three eighths recommended; but then, if I remember rightly, the gentleman who so advised us also suggested the preparation of the details before the general plans. Certainly the details should be prepared in the head at an early stage of proceedings; but, as made, this was one of the most curious recommendations ever put before architects. GOTH.

OBITUARY.

We regret to announce the decease of Mr. John Gibson, F.S.A., F.R.I.B.A., which occurred early on Friday morning at his residence in Great Queen-street, Westminster. Mr. Gibson, who was in his seventy-sixth year, had been in failing health for some time, and death was caused directly by severe bronchitis and pleurisy. In 1836, when Sir Charles Barry was selected as architect for the new Houses of Parliament, Mr. John Gibson was his only pupil, having entered Barry's office in the previous year, and he accompanied his employer to exhibit the plans and the model to King William IV. and Queen Adelaide. After serving a three years' term of pupilage, Gibson remained with him for six years, and assisted him in preparing the details for the Houses of Parliament, as well as in the designs for University College at Oxford, Trentham Hall, Harewood House, near Leeds; Duncombe Park, and the Board of Trade Buildings, Whitehall. Beginning practice in 1844, Mr. Gibson entered at once on a successful career. Among his chief works were Boddwyddan Church, St. Asaph, erected in 1860 for the Dowager Lady Willoughby de Broke; the National Bank of Scotland at Glasgow; Imperial Office, Threadneedle-street; Romanesque Chapel in Broad-street, Bloomsbury; the mansions of Compton Verney, Wroxton Abbey, Charlecote Park, and Guy's Cliffe, all in Warwickshire; and many large houses in Lancashire. His chief work has been as architect to the National Provincial Banking Company, for whom he built their head office at the corner of Threadneedle-street and Bishopsgate, and most of its branch buildings. He also designed Child's Bank in Fleet-street, the S.P.C.K. premises in Northumberland-avenue (the first building erected in that thoroughfare), the Stock Exchange at Glasgow, and Todmorden Town Hall. Most of his works are of a Classic or Italian Renaissance type, and are characterised by a careful study of proportions and great refinement in detail. Mr. Gibson joined the Royal Institute of British Architects in 1849 as an Associate, became a Fellow in 1853, successively served as a Member of Council and Vice-President, and in 1890 was the recipient of the Royal Gold Medal. Mr. Gibson was one of the eight architects who were requested to send in designs for the New Law Courts; but, after full consideration, he declined on the ground of insufficient space being offered for the accommodation required. We gave a portrait of Mr. Gibson in the BUILDING NEWS for July 18, 1890.

Mr. W. T. Roden, the portrait painter and one of the founders of the old Birmingham Art Gallery and of the Royal Society of British Artists, which has its headquarters at Birmingham, died in that city on Christmas Day, at the advanced age of seventy-five.

Mr. James Greenslade, builder, of Stroud, a member of the local board of health, was one of a party who were shooting rabbits on Monday on a farm at Haresfield, near Stroud. They were about to discontinue their sport at dusk when one of the party threw a dead rabbit over a hedge with the intention that the deceased should catch it. The rabbit lodged on the top of a hedge, and Mr. Greenslade was trying to reach it with the stock of his gun when a twig pulled the trigger, and the contents of one barrel entered his side. He died the following day in Stroud Hospital.

Messrs. Reed, Blight, and Co., Limited, contractors, have removed their head offices from Sutton Harbour, Plymouth, to Albany Buildings, 47, Victoria-street, Westminster, S.W., where all communications should be now addressed.

John McCarron, mason, Duncan-street, Glasgow, has been awarded £35 and legal expenses by Sheriff Erskine Murray, in an action against David Short and Son, builders, 68, Bath-street, Glasgow, for injuries sustained by a fall of the jib of a crane at Lambhill on Aug. 4 last.

The tower of Kingston Church, near Taunton, one of the most beautiful in the county of Somerset, has just been restored. The work was intrusted to Messrs. Vickery and Poole, of Milverton, the architect being Mr. J. Houghton Spencer, of Taunton. The rough-cast which covered the upper portion has been removed. The whole of the stonework has been pointed, and the parapet tracery has been strengthened by removing the iron stanchions and replacing them with copper ones. Lightning conductors have been placed on the pinnacles, and the weathercock has been reset and regilt.

PRICES.*—LIII.

(All Trade Discounts have been taken off, and Profit added.)

IRONMONGER, & C. (continued).

HOISTS, MESSRS. SMITH AND STEVENS.

High-pressure lift to raise 8cwt. 50ft. high, fixed in London, 600lb. per square inch	£	s.	d.
.....	245	0	0
.....	255	0	0
.....	270	0	0
Extra per foot	from £1 6s.	to £1 10s.	
Low-pressure to raise 5cwt. 5ft. high 85 b. per square inch	310	0	0
Extra travel per foot run	1	16	0
.....	325	0	0
.....	2	0	0
.....	340	0	0
.....	2	2	0
.....	355	0	0
.....	2	4	0
.....	370	0	0
.....	2	6	0
High-pressure Reliance lifts for warehouses 600lb. to 800lb. per square inch, to raise 4cwt. 5 ft., fixed in London	102	0	0
Extra travel per foot run	0	16	6
.....	122	10	0
.....	1	1	0
.....	132	0	0
.....	1	2	0
.....	152	0	0
.....	1	3	6
.....	170	0	0
.....	1	6	0
.....	19	0	0
.....	1	9	0
.....	210	0	0
.....	1	13	0
.....	250	0	0
.....	2	2	0
Hydraulic rack lift with patent duplicate safety gear to raise 4cwt. 5ft. high	119	0	0
Extra travel per foot run	1	1	0
.....	143	0	0
.....	1	5	0
.....	154	0	0
.....	1	7	6
.....	180	0	0
.....	1	10	0
.....	200	0	0
.....	1	12	6
Trolley for lift, to carry 10cwt.	7	15	0
Ditto box body, with hatch, and floored with sheet iron	10	5	0
Hospital lift, to raise 3cwt. 40ft., fixed in London	61	0	0
.....	77	0	0
Per foot extra fixed	5s. 9d.	to 6s. 6d.	
Hand warehouse lifts, to raise 1cwt. 30ft., fixed in London	29	0	0
Per foot extra fixed	0	5	0
Overhead gearing and balance-weight only	8	10	0
Ditto to raise 2cwt. 30ft.	36	0	0
Per foot extra fixed	0	5	6
Overhead gearing, &c., only	10	0	0
Ditto to raise 3cwt.	40	10	0
Per foot extra fixed	0	5	9
Overhead gearing, &c., only	12	0	0
Ditto to raise 4cwt. 40ft.	49	0	0
Per foot extra fixed	0	5	9
Overhead gearing, &c., only	14	0	0
Ditto to raise 5cwt.	52	0	0
Per foot extra fixed	0	6	0
Overhead gearing, &c., only	16	0	0
Ditto to raise 6cwt.	55	10	0
Per foot extra fixed	0	6	3
Overhead gearing, &c., only	17	0	0
Ditto to raise 8cwt.	60	10	0
Per foot extra fixed	0	6	6
Overhead gearing, &c., only	18	0	0
Ditto to raise 10cwt.	66	10	0
Per foot extra fixed	0	6	6
Overhead gearing, &c., only	19	0	0
Hand dinner lifts, with screw or lever breaks, to raise 30lb. 15ft., fixed in London	18	0	0
Gearing only	6	0	0
Ditto to raise 50lb. 14ft.	20	0	0
Gearing only	6	10	0
Ditto to raise 84lb.	22	15	0
Gearing only	7	0	0
Ditto to raise 10cwt.	24	10	0
Gearing only	8	0	0
Additional height per foot	0	3	6
Ditto, including fixing	0	5	0
Screw brake 4 per cent. extra			
Hand dinner lifts, double, to raise 80lb. 12ft., fixed complete	21	0	0
Price of gearing only	6	10	0
Ditto to raise 56lb.	23	0	0
Price of gearing only	6	15	0
Ditto to raise 81lb. 22ft.	25	10	0
Price of gearing only	7	5	0
Ditto to raise 10cwt.	30	0	0
Price of gearing only	8	10	0
Lightning lifts to travel 12ft., travelling 80ft. to 70ft. in a few seconds, fixed complete	13	10	0
Extra for break	1	10	0
Ditto single	10	15	0
Extra for break	1	10	0
Additional height per foot	0	3	0
Ditto fixed complete	0	4	0
Sideboard or counter-lift to travel 12ft. to raise 40lb. or under, fixed in London	18	0	0
Safety gear extra	1	15	0
Additional travel, fixed complete	0	4	6
Letter lift to travel 12ft., fixed in London	16	17	0
Ditto double cage and fixed	12	5	0
Extra travel per foot	0	2	0
(*This latter is a lower-priced lift.)			

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Cellar or platform hoist for hand-power to raise 5cwt. 10ft.	£	s.	d.
.....	25	0	0
Add for 10ft. higher	3	15	0
Ditto to raise 10cwt.	29	10	0
Add for 10ft.	3	15	0
Ditto to raise 20cwt.	42	10	0
Add for 10ft.	3	15	0
Inclined ar lift with ladder to raise 5cwt. 10ft.	25	10	0
Ditto to raise 10cwt.	33	10	0
Ditto to raise 20cwt.	42	10	0
(No excavation is included.)			
Warehouse cranes gear to raise 10cwt. with 3ft. radius	7	0	0
Ditto ditto 4ft. ditto	8	0	0
Ditto ditto 5ft. ditto	9	10	0
Ditto ditto 6ft. ditto	11	0	0
Crab for ditto	2	19	0
Chain per foot, 5-16	0	0	8
Ditto to raise 1 ton, 3ft. radius	8	10	0
Ditto ditto 4ft. ditto	10	0	0
Ditto ditto 5ft. ditto	11	10	0
Ditto ditto 6ft. ditto	13	0	0
Crab for ditto	4	0	0
Chain for ditto, 7-16, per foot	0	0	10
Ditto to raise 2 tons, 3ft. radius	10	0	0
Ditto ditto 4ft. ditto	12	0	0
Ditto ditto 5ft. ditto	14	0	0
Ditto ditto 6ft. ditto	16	0	0
Crab for ditto	7	7	0
Chain for ditto, 9-16, per foot	0	1	0
ROUNSEVELL'S LIFTS—			
Box 12 by 12 by 18 for restaurants, fixed	9	5	0
Ditto for two floors	10	15	0
Box 15 by 15 by 21 for one floor	9	15	0
Ditto for two floors	11	5	0
Ditto 14 by 12 by 18 double serving lift, to carry 25lb. one floor, fixed	10	15	0
Ditto two floors	12	5	0
Ditto 16 by 14 by 21	11	15	0
Ditto two floors	13	5	0
Ditto 16 by 14 by 21 to carry 1cwt. for one floor	17	0	0
Ditto two floors	19	0	0
Ditto 20 by 18 by 26 for one floor	18	10	0
Ditto for two floors	20	15	0
Ditto 24 by 21 by 30	21	5	0
Ditto two floors	23	15	0
Ordinary dinner lifts to carry 2cwt. one floor high, boxes 18 by 16 by 22, fixed in London	16	0	0
Ditto two floors	18	0	0
Ditto 21 by 18 by 24 for one floor	16	15	0
Ditto two floors	18	15	0
Ditto 24 by 20 by 30 for one floor	17	5	0
Ditto two floors	19	10	0
Ditto 24 by 20 by 30 to carry 1cwt. one floor high	18	0	0
Ditto two floors	20	0	0
Ditto 28 by 34 by 34 for one floor	19	0	0
Ditto two floors	21	0	0
Ditto 34 by 28 by 38 for one floor	20	5	0
Ditto two floors	22	10	0
Add 10 per cent. for patent safety gear.			
Warehouse lifts for loads up to 5cwt., cage 3ft. 0in. by 2ft. 4in. by 4ft. 0in. for one floor, fixed complete	31	15	0
Extra for each floor	2	5	0
Ditto 3ft. 6in. by 2ft. 10in. by 4ft. 6in. for one floor	32	15	0
Extra for each floor	2	5	0
Ditto 4ft. 0in. by 3ft. 4in. by 5ft. 0in. for one floor	36	0	0
Extra for each floor	2	10	0
Ditto for loads up to 10cwt., cage 4ft. 0in. by 3ft. 4in. by 5ft. 0in., fixed complete	41	10	0
Extra for each floor	3	0	0
Ditto 5ft. 0in. by 4ft. 3in. by 5ft. 6in. for one floor	47	0	0
Extra for each floor	3	0	0
Ditto 6ft. 0in. by 5ft. 0in. by 6ft. 0in. for one floor	54	0	0
Extra for each floor	3	7	0
Add 10 per cent. for safety gear.			
Basement lifts vertical to raise 5cwt. 10ft., fixed platform 3ft. 0in. by 2ft. 6in.	23	0	0
Ditto with platform 4ft. 0in. by 3ft. 3in.	25	10	0
Ditto with ditto same size, but to raise 10cwt.	27	10	0
Ditto with platform 4ft. 6in. by 3ft. 6in.	29	0	0
Ditto for incline to raise 5cwt. 10ft., platform 3ft. 0in. by 2ft. 6in., fixed complete in London	23	15	0
Ditto with platform 4ft. 0in. by 3ft. 3in.	26	5	0
Ditto platform 4ft. 0in. by 3ft. 3in., to raise 10cwt. 10ft.	27	0	0
Ditto platform 4ft. 6in. by 3ft. 6in.	29	5	0
(These prices include chain, crab winch, steps, platform, lever, and brake.)			
Bailey's self-sustaining dinner lifts to raise 28lb. 12ft.	16	0	0
Ditto to raise 49lb.	17	5	0
Extra per foot higher	0	4	0
Ditto to raise 56lb.	19	10	0
Gearing only	6	0	0
Extra per foot higher	0	4	3
Ditto to raise 84lb.	22	0	0
Gearing only	7	0	0
Extra per foot higher	0	4	6
Ditto to raise 112lb.	23	10	0
Gearing only	8	0	0
Extra per foot higher	0	4	9
Thomas and Sons' dinner lifts to raise 28lb. 20ft., unfixed (fixing 10 per cent. to 20 per cent., according to position and distance)	13	0	0
Ditto without guides, each	12	0	0
Ditto to raise 56lb.	13	10	0
Ditto without guides	12	10	0
Ditto to raise 84lb. 20ft.	15	10	0
Ditto without guides	14	10	0
Extra per foot higher	0	2	6
Ditto to raise 10cwt. 20ft.	19	10	0
Ditto without guides	18	10	0
Extra per foot higher	0	2	9
Ditto to raise 2cwt. 20ft.	21	0	0
Ditto without guides	20	0	0
Extra per foot higher	0	3	3

Thomas and Sons' dinner lifts to raise 8cwt. 2 ft., unfixed (fixing 10 per cent. to 20 per cent., according to position and distance)	£	s.	d.
.....	23	10	0
Ditto without guides	22	0	0
Extra per foot higher	0	3	3
Luggage and coal lifts to raise 1½cwt. 20ft. high, unfixed (the same percentage to be added for fixing as above)	24	0	0
Ditto without guides	22	10	0
Extra per foot higher	0	3	9
Ditto to raise 2cwt.	27	0	0
Ditto without guides	25	10	0
Extra per foot higher	0	3	9
Ditto to raise 4cwt.	30	0	0
Ditto without guides	28	10	0
Extra per foot higher	0	4	0
Ditto to raise 6cwt.	34	0	0
Ditto without guides	36	0	0
Extra per foot higher	0	4	3
Ditto to raise 8cwt.	40	0	0
Ditto without guides	38	0	0
Extra per foot higher	0	4	6
Ditto to raise 10cwt. 25ft.	45	0	0
Ditto without guides	43	0	0
Extra per foot higher	0	5	0
(No prices include casing or inclosure.)			
Single warehouse lifts to raise 2cwt. 20ft., unfixed (add 10 per cent. to 20 per cent. for fixing)	28	0	0
Ditto without guides	26	10	0
Extra height per foot	0	3	9
Ditto to raise 4cwt. 20ft. each	32	10	0
Ditto without guides	31	0	0
Extra height per foot	0	3	9
Ditto to raise 5cwt. 20ft.	34	0	0
Ditto without guides	32	0	0
Extra height per foot	0	4	0
Ditto to raise 8cwt. 20ft.	38	0	0
Ditto without guides	36	0	0
Extra height per foot	0	4	6
Ditto to raise 10cwt. 25ft.	42	0	0
Ditto without guides	40	0	0
Extra height per foot	0	5	0
Ditto to raise 12cwt. 30ft.	70	0	0
Ditto without guides	65	0	0
Extra height per foot	0	9	0
(None of these extra heights include fixing; add 2 per cent. for it.)			
Double warehouse lifts, to raise 3cwt. 25ft., unfixed	33	0	0
Ditto without guides	31	0	0
Extra height per foot	0	4	6
Ditto to raise 4cwt.	36	0	0
Ditto without guides	33	10	0
Extra height per foot	0	5	0
Ditto to raise 5cwt.	39	0	0
Ditto without guides	36	10	0
Extra height per foot	0	5	0
Ditto to raise 6cwt.	44	0	0
Ditto without guides	41	10	0
Extra height per foot	0	5	0
Ditto to raise 8cwt.	48	0	0
Ditto without guides	45	0	0
Extra height per foot	0	6	0
Ditto to raise 10cwt.	55	0	0
Ditto without guides	52	0	0
Extra height per foot	0	6	6
Furniture lifts to raise 4cwt. 20ft. high, unfixed, each	35	0	0
Ditto without guides	33	0	0
Extra height per foot	0	3	9
Ditto to raise 5cwt.	40	0	0
Ditto without guides	36	0	0
Extra height per foot	0	4	0
Ditto to raise 6cwt. 25ft.	55	0	0
Ditto without guides	51	0	0
Extra height per foot	0	4	6
Ditto to raise 7cwt. 30ft.	63	0	0
Ditto without guides	58	0	0
Extra height per foot	0	6	0
Ditto to raise 8cwt. 30ft.	70	0	0
Ditto without guides	64	0	0
Extra height per foot	0	7	0
Carriage lifts to raise 2cwt. 25ft. high, unfixed	70	0	0
Ditto without guides	64	0	0
Extra height per foot	0	10	0
Ditto to raise 3cwt. 25ft.	80	0	0
Ditto without guides	70	0	0
Extra height per foot	0	12	0
Ditto to raise 4cwt. 25ft.	90	0	0
Ditto without guides	80	0	0
Extra height per foot	0	12	0
Ditto to raise 5cwt. 25ft.	100	0	0
Ditto without guides	90	0	0
Extra height per foot	0	12	0
Add the same rate for fixing as before, including the extra height, if any.			
Invalid lifts to raise 2cwt. 20ft. high, unfixed, each	32	0	0
Ditto without guides	30	10	0
Extra height per foot	0	3	9
Ditto to raise 3cwt. 20ft.	36	0	0
Ditto without guides	34	10	0
Extra height per foot	0	3	9
Ditto to raise 4cwt. 20ft.	42	0	0
Ditto without guides	40	0	0
Extra height per foot	0	4	0
Ditto 25ft.	50	0	0
Ditto without guides	48	0	0
Infirmary and hospital lifts to raise 6cwt. 32ft. high and unfixed	65	0	0
Ditto without guides	60	0	0
Extra height per foot	0	6	0
Ditto to raise 7cwt. 30ft.	78	0	0
Ditto without guides	72	0	0
Extra height per foot	0	7	0
Ditto to raise 8cwt.	85	0	0
Ditto without guides	79	0	0
Extra height per foot	0	8	0
Fixing 16 per cent. to 25 per cent. extra.			

Cage and platform elevators to raise 3cwt. 20ft. high, unfixed	£	s.	d.
Ditto to raise 6cwt.	45	0	0
Ditto ditto 10cwt.	54	0	0
Ditto ditto 15cwt.	68	0	0
Ditto ditto 20cwt.	82	0	0
Ditto ditto 30cwt.	95	0	0
Ditto ditto 40cwt.	120	0	0
Ditto ditto 40cwt.	160	0	0

Passenger lifts and elevators to seat and carry 2 persons (best) 40ft high, unfixed.....	110	0	0
Ditto to carry 3 persons	120	0	0
Ditto ditto 4 ditto	140	0	0
Ditto ditto 5 ditto	160	0	0
Ditto ditto 6 ditto	180	0	0
Ditto ditto 8 ditto	180	0	0
Ditto ditto 10 ditto	200	0	0
Without guides, less	10	0	0

Fixing, 10 per cent. to 20 per cent.			
Extra height per foot, about	0	11	0

No casings or inclosures included in the above prices.			
Area gratings, plain and heavy, and inclusive of patterns and in quantities, per cwt.	0	10	6

SMITH AND FOUNDER.

[It is most essential to obtain prices for all ironwork when there is any quantity; where the patterns are plain they are often in stock, and are then included in price quoted. The price should be "delivered on site."]

Balcony panels and light gratings .. per cwt.	12s	to	15s.	
Canilevers, plain and heavy	ditto	0	12	0
Ditto moulded ditto	ditto	0	13	0
Ditto light and ornamental	ditto	0	16	0
Chimney bars and bearing bars	ditto	0	12	0
12in. coal plates with iron hooks	each	0	1	6
14in. ditto ditto	ditto	0	1	9

Columns, plain caps, and bases, &c., solid, exclusive of patterns, and fixed in place on ground floor	ditto	0	7	6
Ditto with bracket cast on	ditto	0	8	0
Ditto hollow lin. metal plain	ditto	0	8	0
Ditto ditto ditto ornamental caps	ditto	0	8	6
Ditto ditto with brackets cast on and holes left in	ditto	0	9	0

Copings for walls (unfixed)	per cwt.	0	13	0
Dampers and frames 4 by 6 (unfixed)	each	0	1	6
Ditto ditto 5 by 9 ditto	ditto	0	1	7
Ditto ditto 6 by 8 ditto	ditto	0	2	0
Ditto ditto 7 by 9 ditto	ditto	0	2	4
Ditto ditto 8 by 10 ditto	ditto	0	3	3

Furnace or fire bars	ditto	per cwt.	0	10	0
Girders plain, fixed on ground floor.....	ditto		0	9	0
Ditto arched and ornamental	ditto		0	9	6
Hearths ditto ditto	ditto		0	11	0

King and queen heads, corbels, &c., unfixed	ditto	0	10	6
Lintels plain and fixed	ditto	0	10	0
Ditto ornamental ditto	ditto	0	10	6
Newels, unfixed	ditto	0	14	0

Ornamental panels and railing bars, heavy pattern, unfixed	ditto	0	13	0
Partition stays in quantity	ditto	0	15	0
Risers and treads, ornamental	ditto	0	16	0
Sash-weights in quantity, delivered	ditto	0	5	6
Ditto special	ditto	0	6	0
Sewer grates and frames, unfixed	ditto	0	12	6

Soot doors and frames, each	1s. 3d. to 4s. 3d.			
Standards and lamp-posts, plain ... per cwt.	0	10	6	
Ditto ornamental, 11s. 6d. and upwards	ditto			

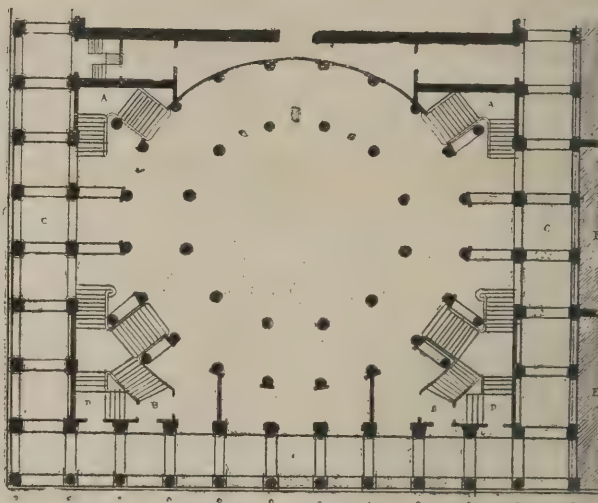
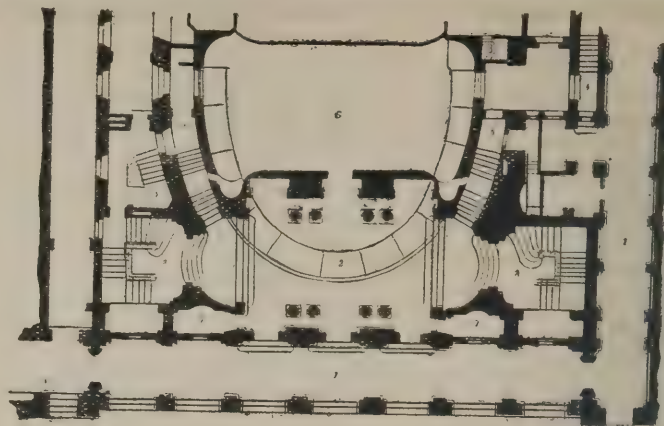
Stanchions — pattern, with three webs fixed on ground floor	ditto	0	8	0
Ditto — pattern and four webs	ditto	0	8	3
Staircases, spiral	18s. 6d. to 19s.			
Ditto fixed, per tread	2s. to 2s. 9d.			
Ditto straight	16s. 6d. to 17s. 0d.			
String for stairs (stone or iron)	0	12	6	
Wall-plates, fixed	per cwt.	0	9	0

THEATRES.—XV.

By ERNEST A. E. WOODROW, A.R.I.B.A.

THERE are plans of the approaches of two old Parisian theatres, which I reproduce from Mr. Gosset's work, and which are of sufficient interest to be included in the series of drawings of grand vestibule and staircase which have been published in the two preceding chapters. Fig. 1 is the opera of the Palais Royal, burnt down in 1781, which was built by M. Moreau, the architect, in 1764. Fig. 2 is the vestibule Théâtre Français, as it was in 1789, bordered in the front by the Rue Richelieu, and on the side by Rue Montpensier. M. Louis was the architect. The theatre was built in 1787.

Before concluding my references to the arrangements of the auditorium and approaches of the theatre, I have little left to say. When that little has been said, it is my intention to treat with the stage and its appurtenances in the same manner as I have done the front of the house, and to describe somewhat shortly the broad outlines of the stage machinery, in order that architects may the better comprehend the necessities of some of the provisions demanded in the planning and construction. When dealing with the mode of constructing a theatre, I hope to be able to furnish the readers of the BUILDING NEWS with some working details of one of the latest and most modern play-houses in London, which have been furnished me for that purpose by the courtesy of the manager of the Horseley Company Ironworks. After this digression, I



FIGS. 1 AND 2.

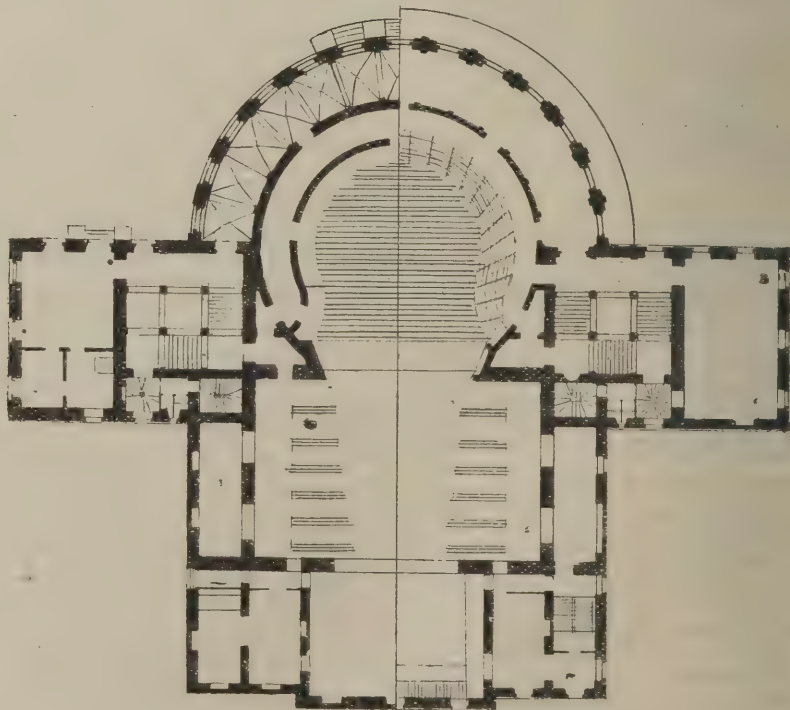


FIG. 4.

must proceed to dispose of the subject immediately in hand in this and the following article.

When the audience has ascended the staircases, to the consideration of which we have devoted the last three chapters, it is for the architect to determine the best level for the corridors in

relation to the tiers, and the best position of the entrance from the corridors into the tiers.

The general plan, as is well known, is to have a corridor round the back of the tiers at the same sweep as the back wall of the circle, as has been seen in the illustrations of the Continental

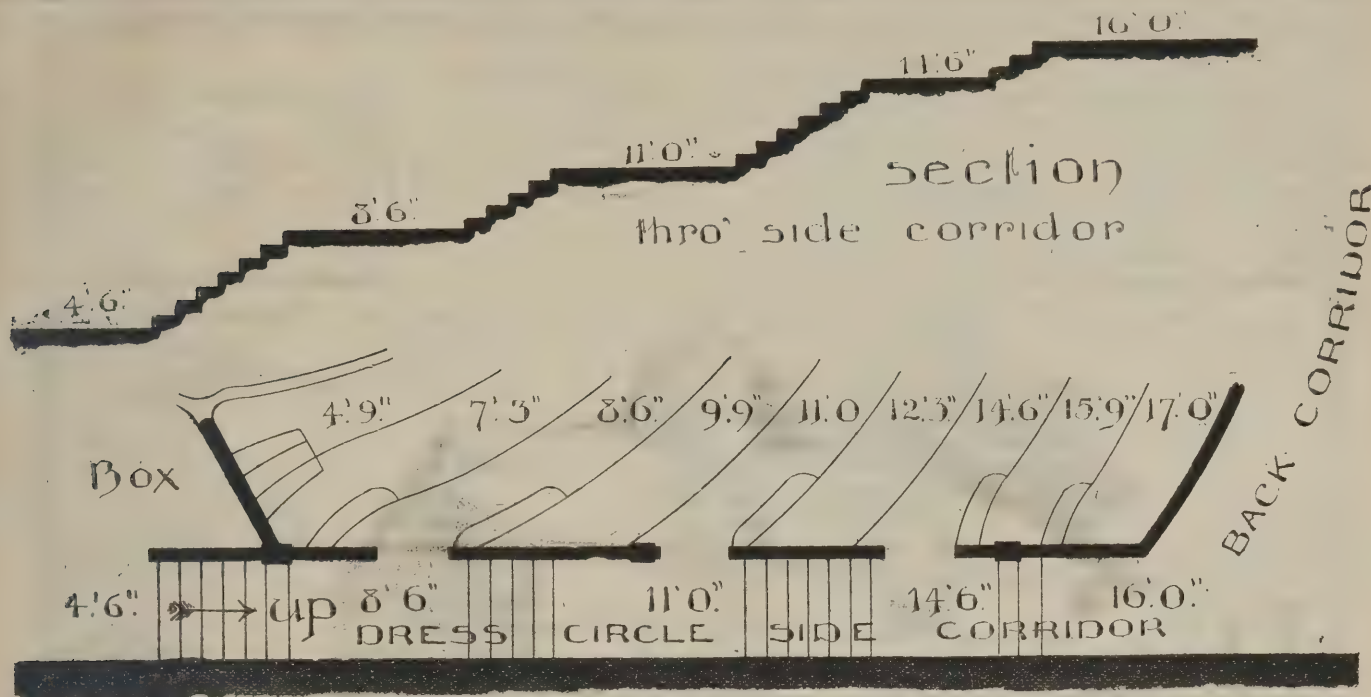


FIG. 3.

theatres which have been produced in the past three papers, and to have a passage-way passing down each side of the tier. The doors to the back corridor should be on a line with the gangways. In recent plans the doors into the side passage-ways are placed at the end of every row, or a door is made available for two or more rows. This arrangement compels the occupants of the seats in the various tiers to ascend towards the corridors before they descend the staircases—a custom which Mr. Tarver, in a paper read before the Sheffield Society of Architects in 1888, strongly condemned.

The accompanying Fig. No. 3 is an illustration of a side corridor of the dress circle of a theatre, showing the actual dimensions of the rise of each row of seats above a given datum line—in this case the vestibule level. It will be seen that for nine rows of seats there are three doorways into the side corridor in addition to the doorways in the back wall leading to the back corridor. It will also be seen that anyone seated in the front row must rise 11ft. 3in. to the back corridor before descending the same distance to gain the vestibule.

Now, Mr. Tarver, in his lecture, dwelt at some length on this point. "A theatre," said he, "is a building in which part of the audience is sometimes placed below the street level, and—almost invariably—several parts of the audience are placed above the street level, and the question is how are the occupants of these respective parts to reach the same level most rapidly? I say that those who are below it should, on leaving their seats, begin to ascend towards it, and that those who are above it, on leaving their seats, immediately begin to descend towards it. This sounds a very simple proposition, and yet I do not know of any theatre (except the Criterion, which is entirely below ground) where this mode of egress is adhered to throughout all parts of the house.

"On the contrary, the usual custom is as follows:—When the occupants of the upper portions of the house (except those in the back, or worst, and therefore most empty row) wish to get out, they have to ascend up to that same back row, to pass through a door, generally into an inclosed passage, and then they have to begin to descend again. In the gallery, or highest portion of the house, this will mean to the occupants of the front row (which, being the best, will always be fullest) an ascent of about 10ft. up, and then a descent of 10ft. down again, equivalent to 40 unnecessary steps of 6in. rise, as well as a journey of some distance along an inclosed passage. Now when all this double journey has been performed, those who started from the front row are precisely at the same level as when they left their seats, and they have still the remainder of the descent to complete down to the street level."

Mr. Tarver argued that the necessity of the admission of the people to their seats at a high level is caused through the custom of introducing the foyer at the back of the seats. "The ancient Romans, under the Empire, were proverbially luxurious, and yet their amphitheatres do not contain vestibules for the various parts of these buildings. On the contrary, they consisted exclusively of seats to see from, and stairs to get in and out by." The lecturer admitted the desirability of saloons as a resort to relieve the tedium, and in which to take refreshment during the time the curtain is down between the acts, and in his scheme said it would be found that he had not neglected the provision for ample saloons in what he considered the proper place.

There is no doubt that this was the origin of the entrance to the seats from the corridors at a high level in the opera houses; where the tiers consisted of continuous private boxes right round the "circle," these were shallow and with no ascent to speak of up to the corridor. In the dramatic theatre, with several rows of seats in each tier, the circumstances are somewhat different, and the rise from the front row to the back row considerable, as seen in the illustration (Fig. 3).

Another argument which has been used in favour of the low-level exit is, that as smoke ascends to the back of the tier, the audience would be escaping from the rising smoke by descending to the doorway at the bottom of the tier in lieu of ascending to the doorway at the top of the tier.

It is very doubtful if the abolition of corridors would be a step in the direction of improvement to theatre planning; in fact, it would appear to be quite the reverse, for the corridors should be of such construction and dimensions, and so shut off from the auditorium by brick walls and lightly-made fire-resisting doors as to form in themselves harbours of refuge into which the audience could immediately fly should danger arise in the auditorium, and be cut off—at any rate, for a time—from the smoke and flames. Where the stage is effectually divided from the auditorium, and the auditorium from the corridors, and there are good exits and good staircase leading directly into the street, on both sides of the house, from the corridors, there will be but slight chance of a catastrophe, provided the audience behave with reason, and not as wild beasts in a panic; and if the audience know of the means of safety provided for them, they will doubtless not become excited and unmanageable. The corridors of each tier should be large enough to take the whole of the occupants of the tier without crushing; they should be fire-proof in construction, in direct communication with the staircases, and be provided with external windows, from which outside aid could reach the audience in cases of a panic or block. External

balconies or staircases from these windows would be of the greatest service.

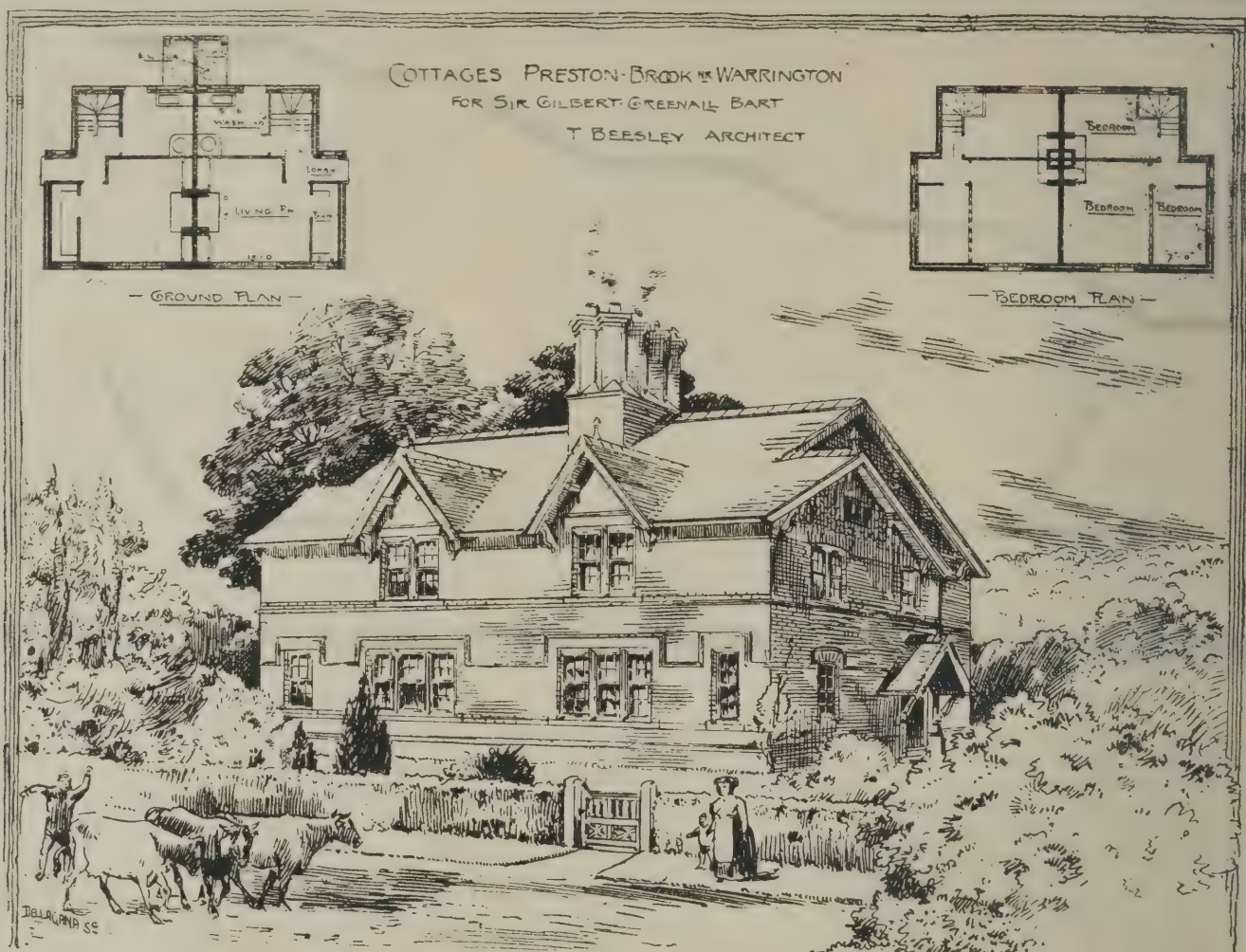
In support of this opinion I quote the following: "The lobbies, corridors, and landings should be separated from the auditorium proper . . . by a sound, strong wall of masonry, with the necessary number of openings for the transaction of business, fitted with strong wrought iron doors . . ." the corridors "should be of such a capacity that they could hold on emergency the whole of the persons accommodated in the parts of the theatre opening on them: with such an arrangement as this, an audience would have an almost absolute certainty of safety in case of accident on the stage, as there would be first the metal curtain, which would keep the flames back for a considerable time, next the immediate exit into lobbies and passages, where they could shut the iron doors behind them, and finally the retreat into the open air, which, under such circumstances, could be made at leisure."

The spaces to be allowed in the corridors for persons has been calculated by an authority as follows:—A crowd can be packed so that each person occupies only 1½sq.ft.; this is very close, and in a moving crowd must be looked upon as dangerous; even allowing 1½sq.ft., there is no safety for the women and children. It has been laid down that a number of grown persons placed loosely together—that is, just touching each other, will occupy upwards of 2sq.ft. each, accurately speaking 2½sq.ft. for every ten persons, but this must be taken as below the allowance which should be given for a crowd filling a corridor. Sir Eyre M. Shaw's rule is for every hundred persons in a theatre the passages, stairs, halls, &c., with immediate access from the several parts of the auditorium, should comprise an area of not less than 250sq.ft., and that the wider the passages and doorways are, the more favourable they are for safety. Thus, while a space of 100ft. by 2½ft. would be sufficient, one of 50ft. by 5ft. would be preferable, and one 25ft. by 10ft. infinitely better.

Now Mr. Tarver in the lecture above mentioned gave his opinion (and it is worth considering) that the true safeguard in emptying a theatre was in the abolition of these inclosed passages which give a crowd no chance of expanding, and in the shortening of the staircases from the upper parts of the house. It is true that corridors which do not allow the free circulation of the crowd must be an evil, not as corridors *per se*, but in their insufficient dimensions and inadequate arrangement.

Fig. 4, the plan of the "Nouveau Théâtre de Mayence," shows an excellent arrangement of external corridors, with free circulation for the audience.

Much has been said at one time and another of the desirability of treating theatres and places of public amusement, like steam-boats and the



COTTAGES PRESTON-BROOK & WARRINGTON
FOR SIR GILBERT GREENALL, BART.
T. BEESLEY, ARCHT.

omnibus, and licensing them to contain a fixed number. This provision would be one of great assistance to the architect, as the manner in which buildings are treated is not always fair to the designer—say, for instance, an architect produces plans for an auditorium in which one thousand people are to be seated, and that upon that data he calculates the number and width of his passages, staircases, and exits, in accordance with the rules laid down by the authorities of the locality—it is neither fair nor just that the building should be made to hold, perhaps half as many again, by crowding the seats, passages, and gangways. The evil of this has been seen by the Middlesex County Council Licensing Committee, and at their recent sessions they introduced a new rule which compels the licensee to keep posted up at the doors notices showing clearly for how many persons accommodation is provided in the different portions of the building, according to the Middlesex County Council regulations, and any infringement of this rule, the chairman said, would be looked upon at the next licensing meeting as forming a ground for non-renewal of the license. Where a theatre is a theatre pure and simple, there will be little or no difficulty for the managers to carry this desirable regulation into effect; but where the house is a theatre of varieties or a music-hall, where the audience is a constantly moving one, it will be hard to regulate the numbers in each division of the house during the performance. At one time, when a popular favourite occupies the stage, the house may be crowded, and in half an hour a portion of the audience may have left the building; then, it is to be presumed, the manager would be at liberty to admit a number equal to that which had left; but how he is to regulate the distribution of the number to the different parts of the house, is a difficulty which scarcely comes within my province to try and solve; but this is the difficulty which has doubtless restricted the universal adoption of the rule to license a building to hold a specified number. If the rule could take the form that no more should be admitted at one time than there are seats provided for in the theatre, perhaps the architect would be pro-

tected against the chance of his building being made to contain more people than he provided safe means of escape for.

COTTAGES, PRESTON BROOK.

THESE cottages are now being erected on the estate of Sir Gilbert Greenall, Bart., one pair at Preston Brook and another pair at Walton, near Warrington. Each cottage contains a living room, washhouse, pantry, and coal place, three good-sized bedrooms, and ample cupboard accommodation. The earth closets and dust are 30ft. from the building. The materials, Ravenhead bricks and Ruabon brick dressings (cavity walls); red sandstone for sills, heads, and mullions; internal walls of washhouse and lobby salt-glazed bricks 4ft. high. Roofs, blue Welsh slates. All eaves for walls, gables, and dormers project 12in. over. Pathways paved with blue Ruabon chequered tiles. A special feature is introduced in the gables by using bricks in imitation of wall tiling. These are made by Mr. Edwards, of Ruabon. The contractor for one pair of cottages is Mr. Jos. Houghton, Higher Whitley, Cheshire; the other pair is built by Mr. R. Beckett, of Hartford. Mr. T. Beesley, of Warrington and Earlestown, is the architect.

COTTAGE HOSPITAL, GALASHIELS.

THE cost of this building, when complete, will be about £3,000. Messrs. Robert Hall and Co., builders, of Galashiels, are the contractors, and the architect is Mr. John Wallace, of 32, Alva-street, Edinburgh.

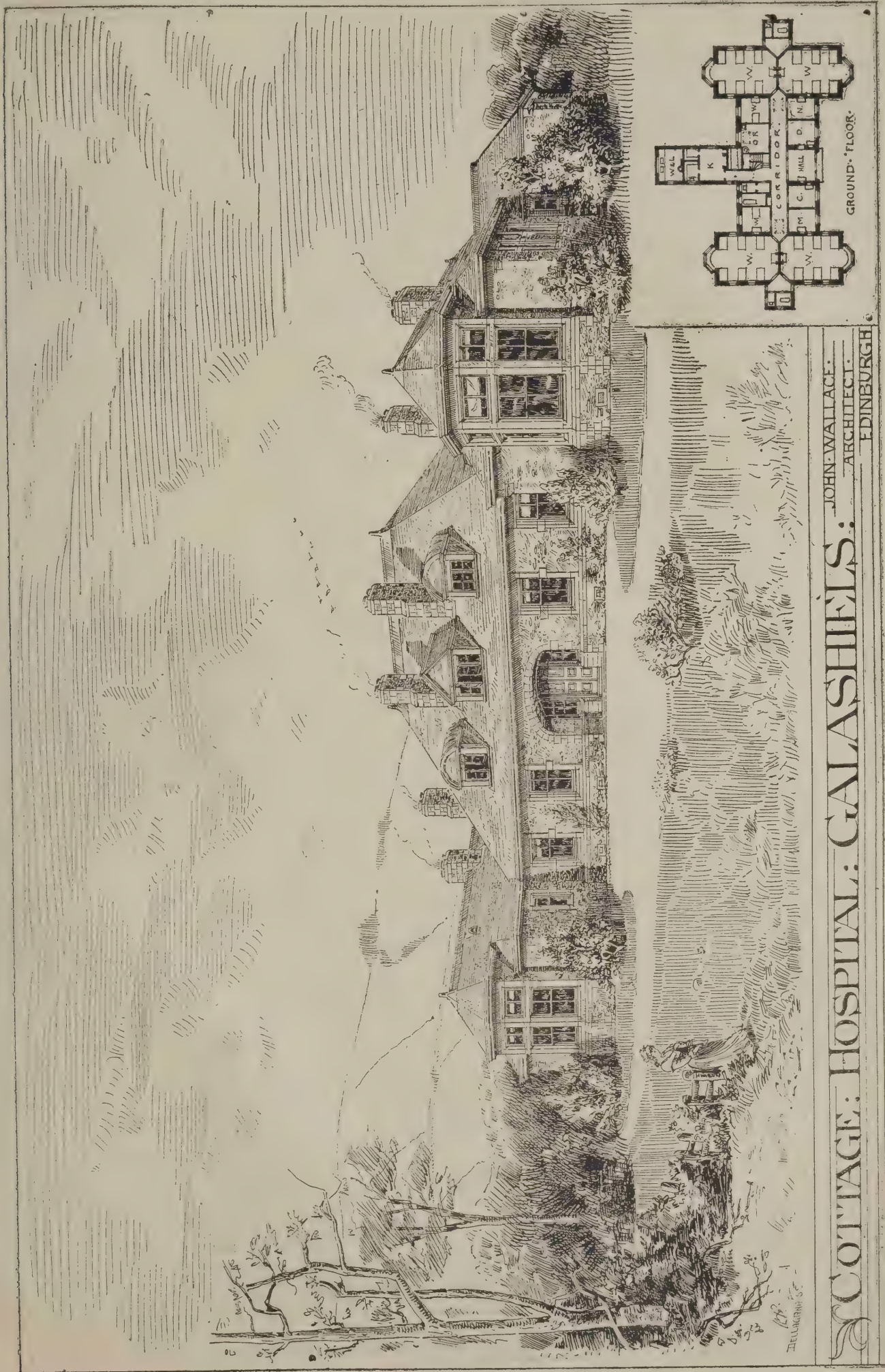
The east window of St. George's Church, Stalybridge, has been filled with stained glass to commemorate the jubilee of the consecration of the church. The principal subjects are the Nativity, Crucifixion, Resurrection, and Ascension of Our Lord. The Four Evangelists occupy the lower portions of lights, and in the tracery openings are sacred symbols. The work has been executed by Mr. William Pape, of Leeds.

Engineering Notes.

ELECTRIC RAILWAYS IN LONDON.—Two Bills have been deposited at the Private Bill Office proposing the construction of new electric underground railways in London. The Clapham Junction and Paddington Railway Bill seeks powers for a subway, four miles one furlong long, from St. John's-hill, Wandsworth-road, to Bishop's-road station on the Great Western Railway. The capital of the company is fixed at £1,050,000. The Edgware-road and Victoria Railway Bill provides for the making of an electric subway, four miles and three furlongs in length, from Edgware-road to Vauxhall Bridge-road at Victoria. The capital of the company in this case is fixed at £1,200,000. The City and South London Railway Company have also deposited a Bill asking for an extension of time for the construction of the subway authorised by their Act of 1890.

NEW RAILWAY BETWEEN BIDSTON AND THE DEE.—The Manchester, Sheffield, and Lincolnshire Railway Company are to extend their system into Birkenhead. The new line through the Hundred of Wirral is to commence at Bidston by a junction with the Hoylake and Deeside Railway at the North Locks, Birkenhead, and to continue on through Upton, Woodchurch, Storeton, Barnston, Leighton, and Newton, then on through Burton as far as the Marsh. It will join the Hawarden line by an embankment. The cost of the scheme will be about £250,000. Mr. Francis Fox, of London, is the engineer. Messrs. Monk and Newell, dock and railway contractors, of Liverpool and Bootle, are the contractors for the construction of the line, and they will begin operations next week.

Another addition has been made by Sir Frederick Burton to the series of works by the Netherlands painters in the National Gallery. It is "La Jeune Musicienne," by Jan Van der Meer, and represents a young woman standing at a harpsichord in a brilliantly-lighted room. The dimensions are 16in. by 20in., and it is hung on a screen in Room X.



COTTAGE HOSPITAL: GALASHIELS: JOHN WALLACE ARCHITECT. EDINBURGH.

Building Intelligence.

ASPATRIA, CUMBERLAND.—Extensive additions and alterations are at present in progress at the buildings of the Agricultural College, Aspatria, from plans prepared by Mr. T. Taylor Scott, F.R.I.B.A., architect, of Carlisle. Two houses occupying a portion of the site have been removed, and one extensive wing—T-shaped—has been erected, the larger portion being three stories high, and consisting of a large new classroom, smoke-room, reading-room, &c. A dining-hall, billiard-room, and private rooms are being built at the opposite end of the site. A large tower has been erected in the centre of the main wing forming a portion of the new reception hall, with stained-glass screens at both ends. In addition to the above, a new front elevation has been formed.

CANTERBURY CATHEDRAL.—The west window in St. Anselm's Chapel has just been filled with stained glass. The subjects are figures of the two Archbishops, Simon of Mepham and Thomas Bradwardine, both of whom are buried in St. Anselm's Chapel, and four medallions filled with scenes from their respective lives.—The work to be paid for by the Beaney bequest is now in progress in the crypt, under the care of Sir Arthur Blomfield, A.R.A., as architect. This work consists in excavating to the original floor level, and paving with stone. Unfortunately, the £1,000 left by Dr. Beaney will not suffice to complete the work, and through agricultural distress the funds of the Dean and Chapter have been so reduced that they will be wholly unable out of them to complete the work.

CHACEWATER.—The church of St. Paul, Chacewater, was reopened on Tuesday, by the Bishop of Truro, after rebuilding. Erected 65 years ago, the church consisted of a parallelogram 90ft. by 53ft. wide, and a small chancel 15ft. wide and only 7ft. deep, whilst a projection of only 18in. in the middle of the north and south walls did duty as transepts. Raised 12ft. above the floor were enormous galleries, crowded with pews, and a plaster ceiling covered the entire area at a height of 32ft. from the floor. The new building consists of nave and chancel, with north and south aisles to both, and the old western tower has been retained until something worthier can be provided. The nave is 62ft. long and 24ft. wide, the total length being 110ft., and the extreme width 53ft. The north and south walls have been lowered from 30ft. to 14ft., the window openings being retained and new granite three-light windows with cusped heads inserted. These walls are connected with the new clerestory walls over the new arcades by a lean-to roof, thus forming north and south aisles. The arcades are of local granite, the shafts of the piers being of Polyphant stone. The roof is an open barrel of the old Cornish type. The chancel is separated from the nave by a low screen of granite and Polyphant stone. The east end is filled by an old east window of the parish church of St. Mary, Truro, given by the rector and vestry of the new Cathedral Church. It is Portland stone, with five lights, and its old stained glass, executed early in the present century by Warrington, has been restored by Messrs. Farniloe, of London. No portion of the old fittings could be reused, except the font, which was designed by the late Mr. J. D. Sedding for the parish church of St. Erth. The seating throughout is new, the nave seating being of red deal, with traceried ends. The chancel seats are of oak. The lectern is of oak, and has been executed by Mr. Harry Hems, of Exeter. The contractor is Mr. W. H. Moyle, of Chacewater, and the architect Mr. Edmund Sedding, of 7, Buckland-terrace, Plymouth.

EDINBURGH.—A new home for the nursing staff of Edinburgh Royal Infirmary was formally opened on Monday. The home is situated on the west side of the main corridor connecting the surgical and medical departments. It is built in the form of a square with a garden in the centre, and is connected with the nurses' dining and reading rooms by a conservatory. Two stories in height, the building is faced with red pressed bricks with yellow stone dressings. The internal accommodation consists of 121 nurses' rooms, a sick-room with six beds, and two separate sick-rooms, 16 bath-rooms, and a large recreation-room. The building was designed by Mr. Sydney Mitchell, architect, of Edinburgh.

MANCHESTER CATHEDRAL.—The reconstruction of the floor of the nave, aisles, chapels, and tower entrance of Manchester Cathedral was begun in June last, and has just been completed. The new floor is laid 6in. lower than the old one. The floor of the main aisles and tower have been paved with Carrara marble in squares of dove and white, laid diagonally, having an ornamental border of rouge Griotte, white, and black marbles. The remaining portions of the floor have been laid with Patteson's mosaic adamant of a red colour, and bands of grey marble are inserted. The work has been carried out by Messrs. J. and H. Patteson, of the Oxford-street Marble Works, Manchester.

NEW YORK.—Bishop Potter laid on Tuesday the corner-stone of the new Episcopal Cathedral of St. John the Divine, the ceremony, which was a most imposing one, being attended by a number of bishops and a great body of clergy. The estimated cost is between one million and two millions sterling. The style is an adaptation of Romanesque details to Middle Pointed outlines, and the plan of the completed structure shows a nave with lofty clerestory and low aisles, apsidal-ended choir with chevet of seven chapels (in which on Sundays services will be performed in seven different languages for the benefit of the mixed population of the city), transepts, and south morning chapel. A lofty spire will mark the crossing, and two others will flank the west front. The architects are Messrs. Heins and La Farge, whose design submitted in competition was illustrated in the *BUILDING NEWS* for April 3, 1891.

ROSEASH, DEVON.—Extensive works of restoration have been carried out at Roseash Church. The nave was restored in 1888-90, and the chancel has now been reopened after reconstruction. The dimensions of the chancel are 21ft. by 17ft., and the work of reconstruction was intrusted to Mr. Clotworthy, of Witheridge. The oak screen has been cleaned and restored by Mr. Clotworthy, who also executed a new oak altar-table, from designs by the architects, Messrs. St. Aubyn and Wadling. On the north side of the church there is a Jacobean screen, dated 1618, which has undergone cleaning.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

THE DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE, AND ART.—The annual conversazione of this institute was held last (Thursday) evening at the Victoria Art Galleries, when an opportunity was afforded the members and friends of viewing the historical and artistic objects forming this year's exhibition of "Old Dundee." An address was given by the president, Mr. W. Mackison, F.S.A.Scot. The following is the programme for the session:—January 5, A. H. Miller, F.S.A.Scot., Dundee, "Curiosities of Architecture in Dundee"; January 19, D. Cunningham, M.I.C.E., Dundee, "Harbours and the Discharging of Vessels"; February 23, Arch. Macpherson, architect, Edinburgh, "Theories of Architectural Proportion"; March 13, Professor J. E. A. Steggall, M.A., Dundee, "The Influence of Town Life on National Character"; April 20, Frank Young, F.R.S.E., F.C.S., Dundee, "The Influence of Minute Quantities of Impurities on the Properties of Useful Metals."

THE ROYAL SCOTTISH ACADEMY.—The prizes awarded by the Council of the Royal Scottish Academy for studies of the figure in the Life School were presented on Friday in the library of the Academy at Edinburgh. The President of the Academy, Sir George Reid, occupied the chair. The Secretary (Mr. George Hay, R.S.A.) read the report of the Council on the Life School. The prize-takers were:—The Chalmers Bursary, Robert J. Brough; extra prize for painting, A. Coutts Fraser; the Chalmers-Jervise prize for the best drawing from the life, A. Coutts Fraser; for the second best drawing from the life, James T. Murray; MacLaine-Watters medal, Robert J. Brough; the Stuart prize, W. Skeoch Cumming and Robert J. Brough—equal. There being no work of sufficient merit by a student in this year's exhibition, the Keith prize was withheld.

The ratepayers of Lancaster have resolved by a decisive majority to adopt the provisions of the Public Libraries Acts.

Correspondence.

DRAINING AND PLUMBING SPECIFICATION.

To the Editor of the *BUILDING NEWS*.

SIR,—I agree with Mr. Dicksee that waste-pipe should not be carried down into cistern-head; but unless the pipe is so fixed as to shoot the water into the cistern-head, it is very likely, in more ways than one, "to discharge over it." Mr. Dicksee's suggestion with reference to the use of a wide R.W. head, may prevent the waste-pipe from drawing air from up the more or less dirty length of pipe below R.W. head; but will not prevent air (or London fog either if in the neighbourhood), from passing "freely" through these pipes direct into the building.

When the difference between external and internal temperature is very great, the rush of air through an untrapped open 1½in. waste would be very objectionable, and although it would prevent said pipe from becoming "foul," it would not, I imagine, be considered a "perfect success" by the average householder, who would probably object to sink, bath, and lavatory wastes being arranged to act as inlet ventilators. I quite recognise the objections to use of traps in these wastes, owing to liability to stoppage, &c., and the difficulty of clearing same, even when fitted with clearing screw-cap, and was in hopes that in condemning the use of them Mr. B. D. had some other and more preferable way of preventing the inrush of damp air, fog, and, in some cases may be, dust and effluvia.—I am, &c., F. S. I.

VENTILATION.

SIR,—I do not quite see the necessity for all the elaborate statements which are being made in connection with the above subject. Everybody, who has any knowledge of it at all, knows that mechanical or artificial ventilation is, in actual practice, unreliable and unsatisfactory, however feasible or admirable it may appear in theory. Some will stoutly maintain the contrary, and marshal forth a mass of statistics in proof of their assertions; but all the same they cannot in any way alter the facts as they are actually found to exist, and which, as Burns says, "are chieft that wunna ding,"—though I am not quite so sure of my Scotch. Automatic ventilation is all very well in its way, but I have seen as many failures with it where it has been ignorantly and unskillfully applied as with mechanical methods, and I quite agree with your correspondent that the greatest care should be taken in the selection of automatic ventilators, as everything depends upon that, there being so many contrivances before the public now which are only ventilators in name.

The climate of this tight little island of ours is, goodness knows, damp enough already, and any mode of ventilation, and I am aware that such exist, that increases the moisture in the air of a building cannot be too strongly condemned.

How is it that the biggest sinner of all has not been "named" in this discussion—viz., heat as a ventilating agent? The failures of this method of ventilation are, I should say, considerably in excess of either mechanical or automatic; and yet no mention was made of it.

Why should Captain MacIlwaine go out of his way to resurrect the past mistakes of the Sanitary Institute?—even though that body might have made attempts to verify them. The "Kew farce" was not taken seriously by the public, the results being too manifestly absurd; so that no great harm was done, and the Institute has doubtless accepted the warnings it received from the *Times* and other sources, which were severe enough in all conscience, and has been trying its best to retrieve itself, and regain the confidence of the public, so that it is hardly fair to have the blunders of its salad days so needlessly raked up again, to make a Roman holiday for the experts. It surely ought to suffice that the president of the Sanitary Institute, Sir Douglas Galton, who, from his position, ought to know what he is talking about, states that an open pipe cannot be relied upon as a means of ventilation. Of course, we all know that; but there is no satisfying some people. With regard to what constitutes good ventilation, it is all very well for experts to say that 150c.ft. of air per hour is necessary for health, when it is safe to say that in not one building out of a dozen is anything like that quantity provided.

What is wanted is a little more practical work and a little less theoretical talk about these matters.—I am, &c., C. E.

Intercommunication.

QUESTIONS.

[10919].—**Joists.**—An opening in a 14in. brick wall 15ft. wide has to carry a load of 17 tons 5cwt. uniformly distributed. I wish to employ two R.L. joists with a plate riveted on the top, the depth of joists not to exceed 13in. What additional strength is gained by adopting this method? Can the lists published by the various merchants be relied upon as to safe loads, depths, &c.?—INQUIRER.

REPLIES.

[10918].—**Strains in Girders.**—There are several good books on strains on bridge girders and trusses, but I cannot think of any that explain the first principles well. Perhaps the best are Stoney's "Strains in Girders and Similar Structures," Cargill's "Strains in Bridges and Roofs," Adams' "Strains in Ironwork" (a cheap elementary book), Humber's "Bridge and Roof Formulae" (a good little book for the office, but of not much use to a man who wishes to grasp the principles of the subject), and Clark's "Graphic Statics." There is no doubt if a few elementary principles were thoroughly mastered, you would find that you could make great progress by books alone.—J. R. PORTER, A.M.I.C.E.

Legal.

CONSTRUCTION OF COVENANTS.

A FREEHOLD house in a square in Newcastle was sold, and at the time of the sale there was an open space in the centre of the square used as a garden. With the obvious purpose of preserving that square as it then was, the purchasers took a covenant in the words following:—"And it is hereby agreed and declared by and between the parties hereto that the garden or open space coloured round with green upon the plan is for ever hereafter to be kept open and unbuilt upon." This appears to have been thought sufficient, and the covenant did not go on to specify that the space should be kept as a garden or square, nor that no building should take place below the surface. In the recent case of "Graham v. the Corporation of Newcastle-on-Tyne" (*Times*, December 11), this covenant came before the Court of Appeal for construction, the defendants having built under the surface of this open space a urinal having an exit and entrance fronting the dwelling-houses round the square. The plaintiff had applied to Mr. Justice Kekewich for an injunction to stop the work; but, as was here noted at the time, he refused, and hence the case was taken to the Court of Appeal.

The Lords Justices have now confirmed their decision, and have construed the covenant with a strictness and a narrow technicality worthy of the strictest times of the old common law courts. They have held that it is no breach of such a covenant to build below the ground in question. All the covenant provides for is that the space shall remain "open and unbuilt upon." Buildings underneath are not within its scope. There was nothing specified in the covenant as to its being kept as an open square in the centre of dwelling-houses. All the plaintiffs could claim was free access of light and air by the ground remaining "open and unbuilt upon." It was argued for the plaintiff that the defendants had no right to interfere with the surface by any buildings, and as the defendants had done this by building air-holes and ventilators, they had broken the covenant. The Court of Appeal, however, would not have it so, and thus, instead of a square or garden "open and unbuilt upon" for ever, the dwelling-houses around look out upon the top of an underground urinal, with glass lights and air-holes, and with an exit in front of their street doors!—all of which shows how carefully such covenants should always be drawn.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

The Aberdeen Infirmary and Asylum Corporation agreed on Tuesday to reconstruct the Royal Lunatic Asylum, and erect a hospital in connection with the institution, at an estimated cost of £50,000.

LEGAL INTELLIGENCE.

RE J. HICKMAN.—James Hickman, builder, of Chester-road, Stretford, and of Heswall, Cheshire, appeared for his public examination at the Salford Bankruptcy Court on Monday. The liabilities amount to £5,440 11s. 7d., and there are no assets. The bankrupt stated that he had been in business from 1862 to the end of 1890, but always without capital, and during the past two years he had been superintending the erection of houses on land he had mortgaged, the mortgagee allowing him £2 a week for his services. His stock-in-trade was sold under an execution in 1890. The furniture he was now using was hired by his wife, who had property of her own. In or about 1862 he was made a bankrupt in the Liverpool Court. His liabilities were about £2,000, and he was not aware that any dividend was paid. His further examination was adjourned.

"OWNERS" UNDER THE BUILDING ACT.—At Clerkenwell Police-court on Tuesday a decision of interest to agents of house property in London was given by Mr. Horace Smith. Mr. Edward Stimpson, house agent and auctioneer, New Kent-road, had been summoned by the sanitary inspector of Clerkenwell for penalties for not obeying an order to have the drains upon premises at 8, Providence-row, repaired according to notice served. Mr. Bodkin, for the defence, had submitted that Stimpson, being only agent for the collection of the rent of the premises, and without any authority to expend money, could not be ordered to do the work required, for the reason that he had disclosed immediately on receipt of the summons the name and address of the actual owner; and further that he was not such an agent as was contemplated by the section defining "owner." Mr. Bodkin now added that the owner had since come forward and directed the work which was now being completed. Mr. Horace Smith said that the agent must be taken as responsible for the owner. He fined Mr. Stimpson 20s. and costs. He consented to state a case for the High Court, but ordered the fine to stand.

EXAGGERATION NOT A FALSE PRETENCE.—Arthur Coles, builder, of St. George's-place and Park-lane, Kensington-gore, was summoned to the Westminster Police-court last week by William Gidney, an apprentice, charging that the sum of £32 10s. was obtained as a premium by false and fraudulent pretences, and with intent to cheat and defraud. The representatives of the boy communicated with Mr. Coles through an advertisement. It was ultimately arranged and settled by indenture and the payment of £32 10s. premium, that the boy was to be taught the trade of a carpenter and joiner. Mr. Coles was alleged to have represented that he employed a certain number of men, that he had important works on hand, and facilities for teaching the trade, all of which statements were now traversed, and asserted to be false. Moreover, it was said that the defendant was in pecuniary difficulties at the time he took the premium, as evidenced by the fact that a County-court judgment for over £30 had been obtained against him. For the defence it was urged that defendant had done nothing which could bring him within the criminal law. The boy had had instruction in his trade. Mr. De Rutzen decided that the defendant's representations when taking the apprentice only amounted to exaggeration. He must dismiss the summons.

IN RE D. PRICE, NANTYMOEL.—A meeting of the creditors of Daniel Price, 12, Osborne-terrace, Nantymoel, builder, was held at Cardiff last week. The debtor's gross liabilities were returned at £4,695 16s. 7d., of which £2,867 4s. 6d. was expected to rank for dividend. The deficiency amounted to £2,867 4s. 6d. The debtor attributed his failure to loss on a contract for the erection of 34 cottages at Tynewydd. In 1893 he commenced business on his own account as a speculative builder and contractor with a capital of about £50, and erected about 114 cottages, all of which he sold, except 32. In June, 1891, he entered into a contract to erect 34 cottages for the Tynewydd Building Club at £144 per house. Eleven of these he finished, and was paid for; seven he got under cover, but the work was delayed, and on August, 1892, the contract was cancelled and all the plant and material seized. The contract was re-let to the debtor's foreman at £32 per house more. The debtor estimated that upon this contract he lost £1,008—£56 per house.

THE LIBERATOR BUILDING SOCIETY.—The charges against J. W. Hobbs, builder, and H. G. Wright, solicitor, of forgery and illegal appropriation of money in connection with the Liberator Society were further heard on Friday before Mr. Vaughan at Bow-street. Evidence was given with respect to the bills alleged to have been forged and uttered by the accused, and also in reference to goods supplied to Hobbs for the Norbury Farm, Streatham, by the firm of Hobbs and Co., Limited, and to the manner in which the defendant's indebtedness on this score—to the amount of £2,279—had been wiped out by transference to certain accounts in the company's books. Witnesses were called to support a charge

against Wright of illegally appropriating to his own use a cheque for £2,500. The case was remanded till January 12, and the accused were again liberated on bail, which was, however, increased to £3,000 for each.

THE QUESTION OF FIXTURES.—The hearing of the case of "Chaplin v. Chapman," adjourned from last Court day, was resumed before Judge Hooper at Loughborough County-court on the 22nd inst. The plaintiff was Fanny Chaplin, wife of Marmaduke Kay Chaplin, builder, Etwell, Derby, and the defendant Joseph Chapman, timber merchant, of Grimsby, and the plaintiff claimed £50 for machinery detained on premises in Regent-street, Loughborough, and defendant entered a counter-claim for £28 10s. for the use and occupation by plaintiff of a saw-mill in Regent-street. The action arose out of the bankruptcy of W. Needham, who for some years carried on business in the saw-mill and premises in Regent-street, Loughborough. On three occasions he mortgaged his property, and the defendant purchased interest under the first mortgage. The plaintiff purchased part of the estate from the trustee in bankruptcy, and thus both parties became connected, and the question at issue was whether certain machinery, valued at £50, on the premises was or was not fixed on the premises. If it was fixed it passed under the mortgage; if not, the plaintiff was entitled to it under her purchase from the trustee in bankruptcy. At the last hearing evidence was called on behalf of the plaintiff to prove that they were not fixtures, and a denial was made that the plaintiff had used or occupied the saw-mill. Mr. Toller, on behalf of the defendant, said the evidence on behalf of the plaintiff had been designed to prove that the machinery was only temporarily fixed to pieces of wood to add to the stability; but he contended, upon cases which he quoted, that if they were so fixed, and added to the value of the machinery or premises, they passed under the mortgage, and this was the case he submitted here. Mr. Vachell replied for plaintiff, contending that none of the machines were attached, that they were merely goods and chattels, and not fixtures. His Honour gave judgment for defendant on the claim and for 40s. for mean profits on the counter-claim. He allowed costs on the highest scale.

RE WILLIAM COLES.—The debtor, an ex-mayor of Winchester, builder, Kingsgate-street, Winchester, filed his own petition, and the public examination took place on the 22nd inst. He filed his liabilities at £2,086 7s. 5d., assets £400 7s. 11d., and deficiency £1,685 19s. 6d. He attributed his position to loss on contracts, failing health, and competition, and depression in trade. He was examined by the Official Receiver mainly as to an arrangement with his creditors in 1893, under which they were to receive 12s. 6d. in the pound, and it was elicited that only some of them were paid.—The debtor was allowed to pass.

"GRINDING MONEY."—Three carpenters who had worked at Knightsbridge for Messrs. Higgs and Hill, builders and contractors, of Lambeth, sued the firm at the Westminster Police-court on the 22nd inst. under the Masters and Servants Act for an hour's wages—9½d., "grinding money," which they alleged was due to them under the agreed rules of employer and employed governing the building trade.—Mr. Mabon, solicitor, who appeared for the defendants, said that it was a bona fide dispute, and it all turned on the construction of one rule, which was most ambiguous in its terms. The workmen, claimed the hour for "grinding money" in addition to an hour's notice.—Mr. De Rutzen said if the object of the gentleman who drafted the rules was to give as much trouble as possible in their interpretation he had succeeded admirably. With the advantage of having tried several of these cases, and of having heard a great deal of evidence as to trade custom, he (the magistrate) was of opinion that the real intention of the rule in dispute was to give men situated as the complainants were an hour's grinding-money, in addition to the hour's notice to which they were clearly entitled. Judgement was therefore in favour of the workmen. Complainants asked for costs.—Mr. De Rutzen said he should not give any costs beyond the costs of the summonses, because the rule was open to argument.

WATER SUPPLY AND SANITARY MATTERS.

ABINGDON SEWERAGE.—A portion of this work, under Mr. G. Winship, surveyor to the borough, has just been carried out. Owing to the nature of the ground, the work was attended with some difficulty, the subsoil water (influenced by the level of the river Thames) standing during the summer 5ft. and upwards above the invert of the sewer, and the soil for a considerable length being of running sand. Stoneware pipes, with Doulton's self-adjusting joint, were adopted, and a very satisfactory result has been obtained.

EDINBURGH AND LEITH.—An important stage in the Water of Leith sewerage and purification scheme

was reached on Monday, when the sewer was joined up in the Blandfield Tunnel, Bonnington. The pipe is now completed from Balerno to the sea. The sewer begins at Balerno with an 18in. pipe, and increases in size to 4ft. 6in., and eventually to a tunnel 7ft. 6in. by 8ft. 6in. Thence the sewage is taken by iron pipes, 5ft. in diameter, to the sea at the Black Rocks. The tanks, settling ponds, and drains in connection with the mills and works in the Water of Leith valley are now well advanced, and the whole scheme will be in operation in the course of the next six months. In the mean time, the effect of the work accomplished on Monday will be that the sewage can now be taken direct to the sea. The Parliamentary estimates for the work amounted to £145,000; but these have been greatly exceeded, chiefly on account of the unexpected increase on compensation claims. The borrowing powers of £200,000 which the Commissioners possess are now all but exhausted, and a Bill is being promoted asking for additional borrowing powers to the extent of £75,000.

WORCESTER.—At the Guildhall, Worcester, Colonel Ducat, R.E., an inspector of the Local Government Board, held an inquiry with reference to the application of the Worcester city council for sanction to borrow £78,000 for the purpose of constructing works for sewage disposal upon land in Bromwich-lane which the city council have agreed to purchase from Earl Beauchamp. By the Worcester Extension Act of 1885 the city was placed under the liability to carry out a scheme of sewage disposal within a limited period. The corporation has only just paid off a loan for large sewerage works which Mr. Hawkesley carried out in 1886, and considerable opposition has been raised to the various schemes recommended. The corporation has approved of the present proposal by 35 votes to 2. Mr. T. Hawkesley, the consulting engineer, said the site was very suitable. The present population was 40,000, and he proposed to provide for 50,000. The annual cost of the works would be £7,000. Mr. F. Candy, C.E., an expert, Major Fosbery, of Warwick, Mr. Mellis, C.E., and Mr. Purchas, Worcester, gave evidence in support of the proposal.

CHIPS.

At a preliminary meeting, held on Wednesday, it was resolved to form a committee for the promotion of a memorial to commemorate the services of the late Sir Richard Owen to science. It is suggested that the memorial should be in the form of a marble statue, to be placed in the hall of the Natural History Museum at South Kensington.

A serious fire occurred on Wednesday night in St. James's-road, Bermondsey, a large three-story building, used as a wholesale cabinet-makers' shop, being completely gutted, while considerable damage was done to adjacent property.

Mr. Harry Hems gave his 24th annual party to aged people of the city at his Ecclesiastical Art Studios at Exeter on St. Stephen's day, feasting on Christmas fare 67 old citizens and their wives. Among the guests present were the bishop of the diocese and the mayor of the city.

Mr. J. W. Start, F.S.I., of Cups Chambers, Colchester, has been favoured with instructions to prepare plans for a village club at Lenden, Colchester, for Captain Naylor-Leyland, M.P.

On Thursday, Dec. 22, an inquiry was held at the town hall, Haverhill, by Col. J. O. Halstead, an inspector of the Local Government Board, who attended for the purpose of learning any objections to the local board of Haverhill borrowing £8,400 for works of water supply and £1,800 for street improvements. No opposition was offered to the proposals of the board.

Messrs. Bailey Denton, Son, and North, MM. Inst. C.E., have been instructed by the guardians of the Ware Union to prepare plans and specifications for the water supply of Broxbourne and Wormley, Herts. The supply of water to be obtained from the mains of the Cheshunt Local Board, and a storage reservoir for the use of combined district is to be built in the parish of Broxbourne. A scheme of public water supply will prove of great benefit to this very favourite residential neighbourhood.

Mr. Tulloch, an inspector to the Local Government Board, held an inquiry at the Sailors' Institute, Goole, on Friday, relative to an application by the Goole local board for power to borrow £9,245 for certain works, including £4,000 for the purchase of a site for a market hall.

The Runcorn rural sanitary authority have adopted plans by Mr. Percy Sulcock, C.E., for the extension of the sewage works, at an estimated cost of £1,500.

In the case of the bankruptcy of William Inkpen and Walter Inkpen (trading as William Inkpen and Son), Sturminster Newton, Dorsetshire, builders and contractors, the discharge from bankruptcy has been suspended for two years ending Nov. 15, 1894.

Our Office Table.

"MINIATURES" formed the subject of a lecture delivered by Mr. J. W. Bradley on Friday evening before the Birmingham and Midland Institute. He dealt with the kind of painting employed in the ages before the 16th century, and not the modern portrait painters—of the rules and canons under which miniatures were produced, and the necessity for monastic interference in these matters. Mr. Bradley defined illumination, and distinguished it from miniature, and alluded to the different styles from the Byzantine to the English period. He sketched the gradual development of the art of historic miniature, its qualities and limits, and mentioned instances of the cost of illuminated books in the Middle Ages. Thus a Bible belonging to King John of France, which contained over five thousand miniatures in one volume, and nearly five thousand in another, cost 432,000f., or £4,480, independently of vellum, penmanship, and binding. As to how they knew who executed miniatures that were not signed, he said that from the end of the 6th to the end of the 12th century the work might be often identified from a little attention and comparison of the dates in the obituaries of the monasteries. Many of the guild books in existence also formed the means of identifying the work. After the 13th century municipalities and towns and boards of works of cathedrals kept private reporters and books, as also did many distinguished personages. The chief productions in the earliest times were Bibles, sacramentaries, and psalters. After the 12th century the books included sermons, homilies, law treatises, and grammars; the 13th century encyclopedias, romances, and poems; the 14th more Bibles, law books, and romances; and in the 15th century they had everything hitherto produced, with the addition of lay service books, which became fashionable at the beginning of that century for presentation purposes. He spoke, in conclusion, of the four or five great styles in our libraries, and of the names of the miniaturists.

The Manchester Council for the Registration of Plumbers (secretary, Mr. Fred Scott, 44, John Dalton-street) have arranged for a prize essay competition. Prizes of £3 3s. and £1 1s. will be given for the best essays on "Roof-work and down-spouts" (open to registered operative plumbers only), and others of similar amount for the best two essays on "The best system of hot-water circulation for a house of £50 rental, and the best suggestions for supplying hot water to a row of cottages of, say, £15 each." These essays are to deal with the best means of preventing freezing of pipes, cylinders, and cisterns, and the prevention of kitchen-boiler explosions. They will be open to registered operative plumbers under 25 years of age only. Prizes are also offered for the best two essays on "Common defects in plumbers' work, and their remedy." These are open to all plumbers—masters or operatives, registered or not. The essays must be sent in before January 31.

On January 2nd the New York Architectural League will hold its exhibition, and, as formerly, completed work, such as carving in stone and wood, wrought-iron work, mosaic, furniture, and glass, will be shown, besides the architectural drawings and designs forming the bulk of the exhibition. Designers of all schools are admitted, provided their work is good; and exhibits are collected by the promoters of the exhibition from all parts by authorised agents, and prizes are given. The result is the exhibition pays, as the exhibitors are liberally treated.

MEETING FOR THE ENSUING WEEK.

THURSDAY.—Dundee Institute of Architecture. "Curiosities of Architecture in Dundee," by A. H. Miller, F.S.A. Scot., Dundee. 8 p.m.

Holloway's Pills.—For curing diseases of the throat, windpipe, and chest, these Pills have pre-eminently established a world-wide fame, and in complaints of the stomach, liver, and kidneys they are equally efficacious. They are composed of rare balsams, without a single grain of mercury or any other deleterious substance.

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Trade News.

WAGES MOVEMENTS.

MIDDLESEX COUNTY COUNCIL AND THE STANDARD WAGE.—Mr. W. Barnes, chairman of the Building Trades Federation, and Mr. J. Rogers have waited upon the chairman of the visiting committee of the Middlesex County Council with regard to the strike at the Middlesex County Asylum at Upper Tooting. The question was discussed, and the committee decided to put all the men engaged at the asylum upon a permanent wage, which would not be less than the current rate for the London district, but which in some cases would exceed it.

KIRKCALDY, N.B.—The master joiners have intimated a reduction of 1d. per hour to take effect from Monday next. The workmen at a meeting held on Friday strongly condemned the action of the masters in making the reduction, considering that the state of trade did not warrant it, and no other town in Scotland had taken such a step. It was agreed, however, to accept the reduction under protest, but to take the earliest opportunity to recover the reduction.

BRICKLAYERS' STRIKE COMMITTEE.—The Central Strike Committee of the Operative Bricklayers' Society have issued a report of their work. The committee were appointed in March last by the Bricklayers' Society to obtain certain advances of wages, and reduction of hours for their members. After preliminary negotiations with the Master Builders' Association, a conference was arranged between all sections of the building trades and the employers. This delay was not pleasing to certain members of the union, and some branches threatened to strike on June 1, but wiser councils prevailed, and on June 10 last the delegates from the Bricklayers', Masons', Plasterers', Carpenters', Painters', Smiths', Fitters', Navvies' and General Labourers' Unions met the Master Builders' Association. The result, as is well known, was a great victory for the men. An agreement was drawn up, which, with one or two small exceptions, has been acted upon throughout the London district. The total cost of the whole movement, including strike pay, picket pay, printing, postage, salaries, and travelling expenses, amounts to £372 18s. 11d., or an average 1s. 3d. per member for the London district. The advance in wages to the London bricklayers alone means £28,116 per annum, besides that which has been obtained by the other trades.

A high-level bridge across the Thames, between Ratcliff and Rotherhithe, is proposed by Max am Ende as being less expensive than the steam ferry projected by the London County Council.

The four-light window over the entrance to the library, on the south-east side of the chancel of Manchester Cathedral, has this week been filled in with stained glass, as a memorial. The window has been executed by Messrs. Heaton, Butler, and Bayne, of London.

The Leeds corporation have accepted a tender for the erection of mortuary chapels at Woodhouse Hill Cemetery, Hunslet, at a cost of £478. The mortuary chapels will form an extension at each end of the present building. The corporation have under consideration a proposal for the acquisition of a site for a cemetery for the district of North Leeds.

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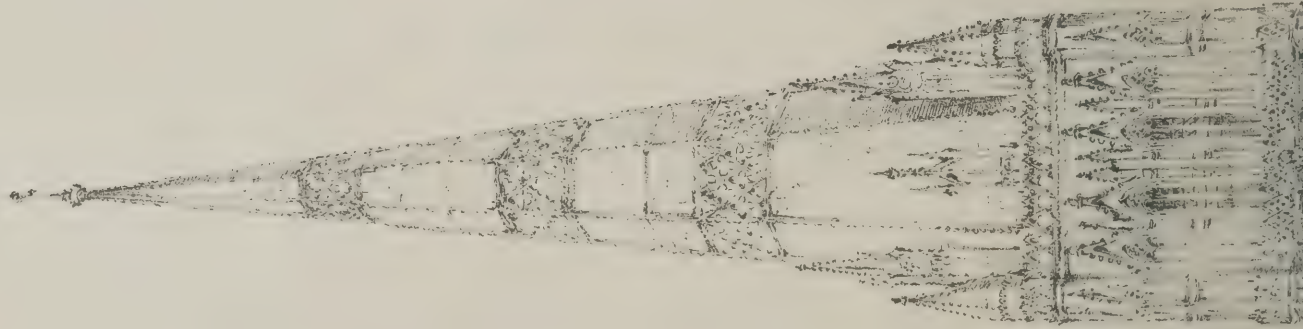
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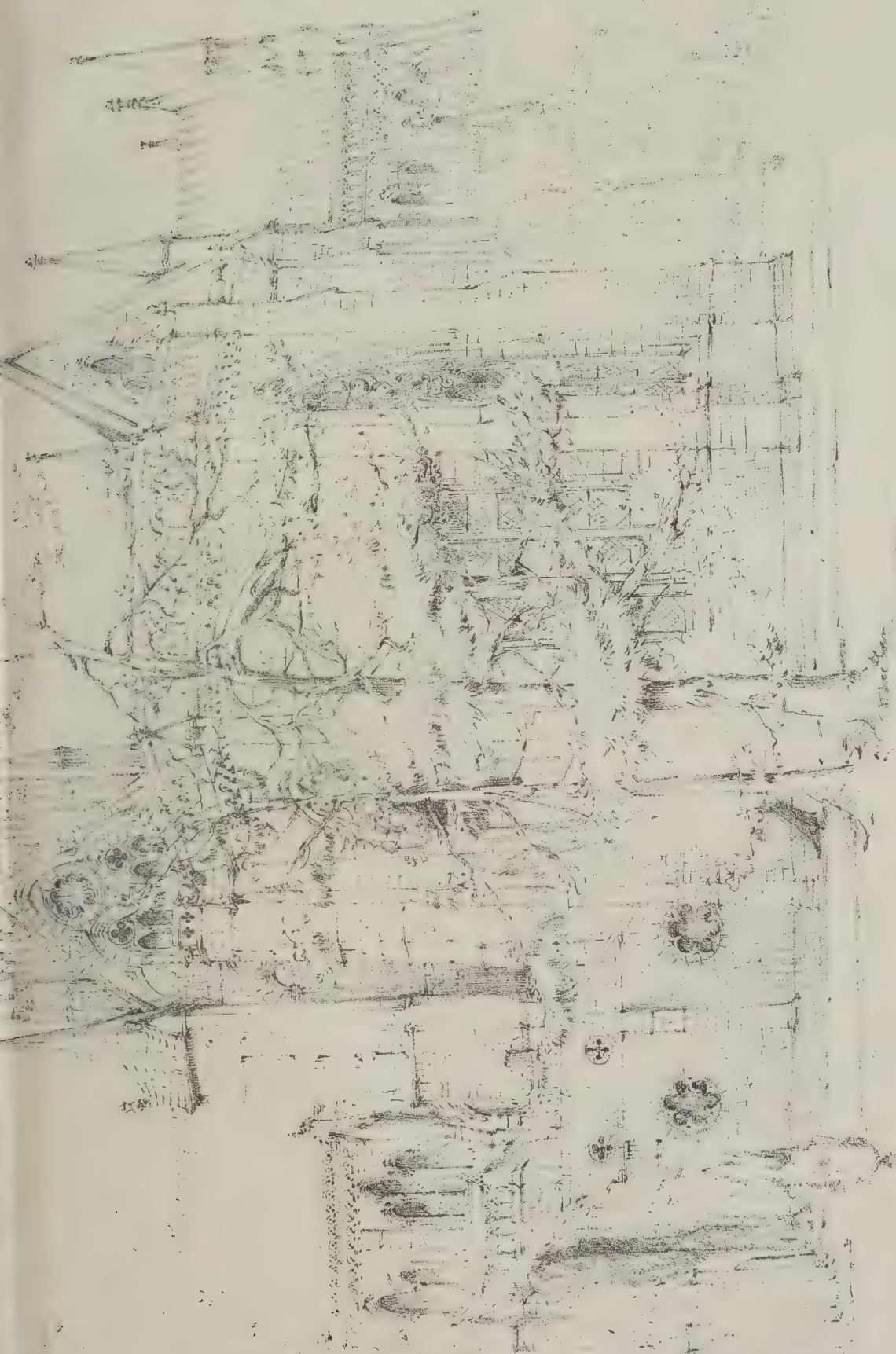
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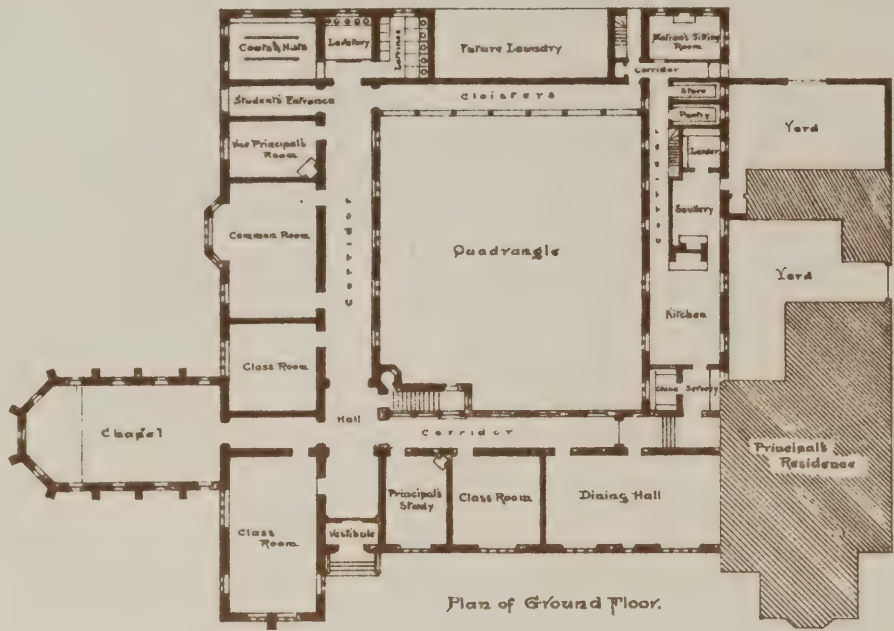




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NORTH WALES.

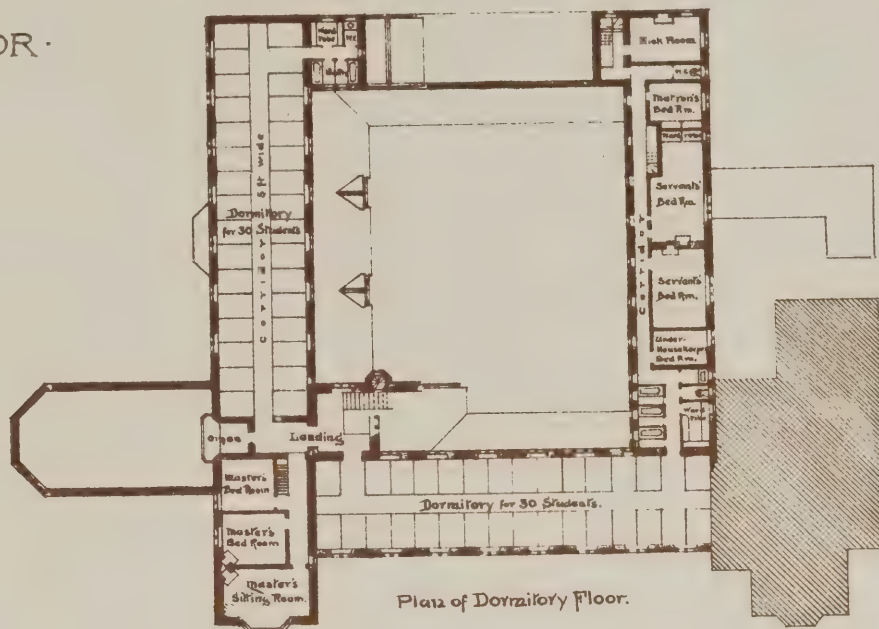
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NEWS, DEC. 30, 1892.

TRAINING COLLEGE BANGOR.

BY ROBERT GRIERSON ARCHT





DEC. 30, 1892.

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